



Testimony

Before the Committee on Homeland
Security and Governmental Affairs,
U.S. Senate

For Release on Delivery
Expected at 2:30 p.m. ET
Tuesday, July 16, 2019

2020 CENSUS

Actions Needed to Address Key Risks to a Successful Enumeration

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GAO Highlights

Highlights of [GAO-19-588T](#), a testimony before the Committee on Homeland Security and Governmental Affairs, U.S. Senate

Why GAO Did This Study

The Bureau is responsible for conducting a complete and accurate decennial census of the U.S. population. The decennial census is mandated by the Constitution and provides vital data for the nation. A complete count of the nation's population is an enormous undertaking as the Bureau seeks to control the cost of the census, implement operational innovations, and use new and modified IT systems. In recent years, GAO has identified challenges that raise serious concerns about the Bureau's ability to conduct a cost-effective count. For these reasons, GAO added the 2020 Census to its High-Risk list in February 2017.

GAO was asked to testify about the reasons the 2020 Census remains on the High-Risk List and the steps the Bureau needs to take to mitigate risks to a successful census. To do so, GAO summarized its prior work regarding the Bureau's planning efforts for the 2020 Census. GAO also included preliminary observations from its ongoing work examining the IT systems readiness and cybersecurity for the 2020 Census. This information is related to, among other things, the Bureau's progress in developing and testing key systems and the status of cybersecurity risks.

What GAO Recommends

Over the past decade, GAO has made 106 recommendations specific to the 2020 Census to help address issues raised in this and other products. The Department of Commerce has generally agreed with the recommendations. As of June 2019, 31 of the recommendations had not been fully implemented.

View [GAO-19-588T](#). For more information, contact Robert Goldenkoff at (202) 512-2757 or by email at goldenkoff@gao.gov and Nick Marinos at (202) 512-9342 or by email at marinosn@gao.gov.

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2020 CENSUS

Actions Needed to Address Key Risks to a Successful Enumeration

What GAO Found

The 2020 Decennial Census is on GAO's list of high-risk programs primarily because the Department of Commerce's Census Bureau (Bureau) (1) is using innovations that are not expected to be fully tested, (2) continues to face challenges in implementing information technology (IT) systems, and (3) faces significant cybersecurity risks to its systems and data. Although the Bureau has taken initial steps to address risk, additional actions are needed as these risks could adversely impact the cost, quality, schedule, and security of the enumeration.

- **Innovations.** The Bureau is planning several innovations for the 2020 Census, including allowing the public to respond using the internet. These innovations show promise for controlling costs, but they also introduce new risks, in part, because they have not been used extensively, if at all, in earlier enumerations. As a result, testing is essential to ensure that key IT systems and operations will function as planned. However, citing budgetary uncertainties, the Bureau scaled back operational tests in 2017 and 2018, missing an opportunity to fully demonstrate that the innovations and IT systems will function as intended during the 2020 Census. To manage risk to the census, the Bureau has developed hundreds of mitigation and contingency plans. To maximize readiness for the 2020 Census, it will also be important for the Bureau to prioritize among its mitigation and contingency strategies those that will deliver the most cost-effective outcomes for the census.
- **Implementing IT systems.** The Bureau plans to rely heavily on IT for the 2020 Census, including a total of 52 new and legacy IT systems and the infrastructure supporting them. To help improve its implementation of IT, in October 2018, the Bureau revised its systems development and testing schedule to reflect, among other things, lessons learned during its 2018 operational test. However, GAO's ongoing work has determined that the Bureau is at risk of not meeting near-term IT system development and testing schedule milestones for five upcoming 2020 Census operational deliveries, including self-response (e.g., the ability to respond to the 2020 Census through the internet). These schedule management challenges may compress the time available for the remaining system development and testing, and increase the risk that systems will not function as intended. It will be important that the Bureau effectively manages IT implementation risk to ensure that it meets near-term milestones for system development and testing, and that it is ready for the major operations of the 2020 Census.
- **Cybersecurity.** The Bureau has established a risk management framework that requires it to conduct a full security assessment for nearly all the systems expected to be used for the 2020 Census and, if deficiencies are identified to determine the corrective actions needed to remediate those deficiencies. As of the end of May 2019, the Bureau had over 330 corrective actions from its security assessments that needed to be addressed, including 217 that were considered "high-risk" or "very high-risk." However, of these 217 corrective actions, the Bureau identified 104 as being delayed. Further,

74 of the 104 were delayed by 60 or more days. According to the Bureau, these corrective actions were delayed due to technical challenges or resource constraints. GAO recently recommended that the Bureau take steps to ensure that identified corrective actions for cybersecurity weaknesses are implemented within prescribed time frames. Resolving identified vulnerabilities more timely can help reduce the risk that unauthorized individuals may exploit weaknesses to gain access to sensitive information and systems.

To its credit, the Bureau is also working with the Department of Homeland Security (DHS) to support its 2020 Census cybersecurity efforts. For example, DHS is helping the Bureau ensure a scalable and secure network connection for the 2020 Census respondents and to strengthen its response to potential cyber threats. During the last 2 years, as a result of these activities, the Bureau has received 42 recommendations from DHS to improve its cybersecurity posture. GAO recently recommended that the Bureau implement a formal process for tracking and executing appropriate corrective actions to remediate cybersecurity findings identified by DHS. Implementing the recommendation would help better ensure that DHS's efforts result in improvements to the Bureau's cybersecurity posture.

In addition to addressing risks which could affect innovations and the security of the enumeration, the Bureau has the opportunity to improve its cost estimating process for the 2020 Census, and ultimately the reliability of the estimate itself, by reflecting best practices. In October 2017, the 2020 Census life-cycle cost estimate was updated and is now projected to be \$15.6 billion, a more than \$3 billion (27 percent) increase over its earlier estimate. GAO reported in August 2018 that although the Bureau had taken steps to improve its cost estimation process for 2020, it needed to implement a system to track and report variances between actual and estimated cost elements. According to Bureau officials, they planned to release an updated version of the 2020 Census life-cycle estimate in the spring of 2019; however, they had not done so as of June 28, 2019. To ensure that future updates to the life-cycle cost estimate reflect best practices, it will be important for the Bureau to implement GAO's recommendation related to the cost estimate.

Over the past decade, GAO has made 106 recommendations specific to the 2020 Census to help address these risks and other concerns. The Department of Commerce has generally agreed with these recommendations and has taken action to address many of them. However, as of June 2019, 31 of the recommendations had not been fully implemented. While all 31 open recommendations are important for a high-quality and cost-effective enumeration, 9 are directed at managing the risks introduced by the Bureau's planned innovations for the 2020 Census. To ensure a high-quality and cost-effective enumeration, it will be important for the Bureau to address these recommendations.

Chairman Johnson, Ranking Member Peters, and Members of the Committee:

We are pleased to be here today to discuss the U.S. Census Bureau's (Bureau) progress in preparing for the 2020 Decennial Census. Conducting the decennial census of the U.S. population is mandated by the Constitution and provides vital data for the nation. The information that the census collects is used to apportion the seats of the House of Representatives; redraw congressional districts; allocate billions of dollars each year in federal financial assistance; and provide a social, demographic, and economic profile of the nation's people to guide policy decisions at each level of government. Further, businesses use census data to market new services and products and to tailor existing ones to demographic changes.

A complete count of the nation's population is an enormous undertaking. The Bureau, a component of the Department of Commerce (Commerce), is seeking to control the cost of the 2020 Census while it implements several innovations and manages the processes of acquiring and developing information technology (IT) systems.

In recent years, we have identified challenges that raise serious concerns about the Bureau's ability to conduct a cost-effective count of the nation, including issues with the agency's research, testing, planning, scheduling, cost estimation, systems development, risk management, and cybersecurity practices.

Over the past decade, we have made 106 recommendations specific to the 2020 Census to help address these and other concerns. Commerce has generally agreed with our recommendations and has made progress in implementing them. However, 31 of the recommendations had not been fully implemented as of June 2019, although the Bureau had taken initial steps to address many of them. In addition, one recommendation was closed as the Bureau decided to implement a different approach than the one about which the recommendation was directed.

We added the 2020 Decennial Census to our high-risk list in February 2017, and it remains on our high-risk list today.¹ As preparations for the next census continue to ramp up, fully implementing our recommendations to address the risks jeopardizing the 2020 Census is more critical than ever.

At your request, our testimony today will describe (1) why the 2020 Decennial Census remains a high-risk area and (2) the steps that Commerce and the Bureau need to take going forward to mitigate the risks jeopardizing a secure and cost-effective census.

The information in this statement is based primarily on our prior work regarding the Bureau's planning efforts for 2020.² For that body of work, we reviewed, among other things, relevant Bureau documentation, including the 2020 Census Operational Plan; recent decisions on preparations for the 2020 Census; and outcomes of key IT milestone reviews.

In the summer of 2018 we visited the Bureau's 2018 End-to-End test site in Providence County, Rhode Island to observe door-to-door field enumeration during the non-response follow-up, an operation where enumerators personally visit each non-responding household to include them in the census. We also discussed the status of our recommendations with Commerce and Bureau staff. Other details on the scope and methodology for our prior work are provided in each published report on which this testimony is based.

¹GAO, *High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, [GAO-19-157SP](#) (Washington, D.C.: Mar. 6, 2019) 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). GAO maintains a high-risk program to focus attention on government operations that it identifies as high-risk due to their greater vulnerabilities to fraud, waste, abuse, and mismanagement or the need for transformation to address economy, efficiency, or effectiveness challenges.

²For example, GAO, *2020 Census: Additional Actions Needed to Manage Risk*, [GAO-19-399](#) (Washington, D.C.: May 31, 2019); *2020 Census: Additional Steps Needed to Finalize Readiness for Peak Field Operations*, [GAO-19-140](#) (Washington, D.C.: Dec. 10, 2018); *2020 Census: Continued Management Attention Needed to Address Challenges and Risks with Developing, Testing, and Securing IT Systems*, [GAO-18-655](#) (Washington, D.C.: Aug. 30, 2018); *2020 Census: Bureau Has Made Progress with Its Scheduling, but Further Improvement Will Help Inform Management Decisions*, [GAO-18-589](#) (Washington, D.C.: July 26, 2018); and, *2020 Census: Actions Needed to Address Challenges to Enumerating Hard-to-Count Groups*, [GAO-18-599](#) (Washington, D.C.: July 26, 2018).

In addition, we included information in this statement from our ongoing work on the readiness of the Bureau's IT systems for the 2020 Census. Specifically, we collected and reviewed documentation on the status and plans for system development and testing, and for addressing cybersecurity risk, for the 2020 Census. This includes the Bureau's integration and implementation plan, memorandums documenting outcomes of security assessments, and reports prepared by the Department of Homeland Security (DHS) for the Bureau on cybersecurity risks. We also interviewed relevant agency officials.

We provided a copy of the applicable new information that we are reporting in this testimony to the Bureau and DHS for comment on June 25, 2019. The Bureau provided technical comments, which we addressed as appropriate.

We conducted the work on which this statement is based 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

As shown in table 1 the cost of counting the nation's population has been escalating with each decade. The 2010 Census was the most expensive in U.S. history at about \$12.3 billion, and was about 31 percent more costly than the \$9.4 billion 2000 Census (in 2020 dollars).³ According to the Bureau, the total cost of the 2020 Census in October 2015 was

³According to the Bureau, these figures rely on fiscal year 2020 constant dollar factors derived from the Chained Price Index from "Gross Domestic Product and Deflators Used in the Historical Tables: 1940–2020" table from the Fiscal Year 2016 Budget of the United States Government.

estimated at \$12.3 billion and in October 2017 that cost estimate grew to approximately \$15.6 billion, approximately a \$3 billion increase.⁴

Additionally, Bureau officials told us that while the estimated cost of the census had increased to \$15.6 billion, it was nevertheless managing the 2020 Census to a lower cost of \$14.1 billion. Bureau officials explained that the \$14.1 billion includes all program costs and contingency funds to cover risks and general estimating uncertainty. The remaining \$1.5 billion estimated cost is additional contingency for “unknown unknowns”—that is, low probability events that could cause massive disruptions—and several what-if scenarios such as an increase in the wage rate or additional supervisors needed to manage field operations.⁵

Table 1: The Cost of Previous Decennial Censuses and the Estimated Cost of the 2020 Census

Benchmark	Cost	Explanation
2000 Census	\$9.4 billion ^a	Final cost of the 2000 Census
2010 Census	\$12.3 billion ^a	Final cost of the 2010 Census
2020 Census estimated cost in October 2015	\$12.3 billion ^a	Initial cost estimate of the 2020 Census
2020 Census estimated cost in October 2017	\$15.6 billion ^b	Revised cost estimate of the 2020 Census
2020 Census cost estimate less a portion of contingency funds	\$14.1 billion ^b	Cost estimate the Bureau is managing operations to for the 2020 Census

Source: GAO analysis of Census Bureau data. | GAO-19-588T

Notes:

^aConstant 2020 dollars.

^bInflated to the current 2020 Census time frame, fiscal years 2012 to 2023.

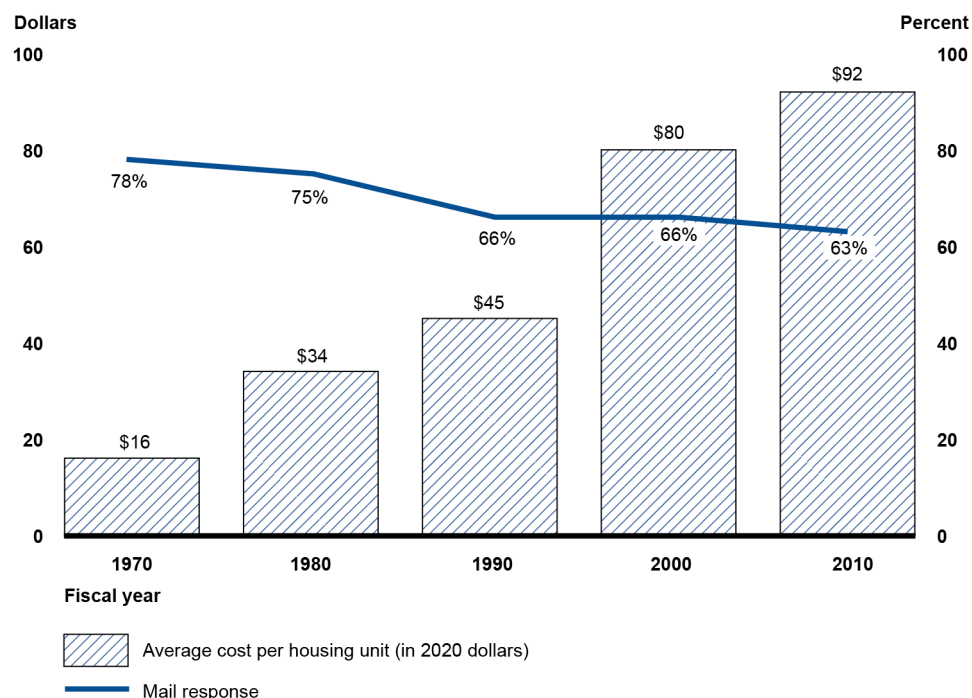
⁴The historical life-cycle cost figures for prior decennials as well as the initial estimate for 2020 provided by Commerce in October 2017 differ slightly from those reported by the Bureau previously. According to Commerce documents, the more recently reported figures are “inflated to the current 2020 Census time frame (fiscal years 2012 to 2023),” rather than to 2020 constant dollars as the earlier figures had been. Specifically, since October 2017, Commerce and the Bureau have reported the October 2015 estimate for the 2020 Census as \$12.3 billion; this is slightly different than the \$12.5 billion the Bureau had initially reported.

⁵The \$15.6 billion cost estimate for the 2020 Census includes a total of \$2.6 billion in contingency funds.

Moreover, as shown in figure 1, the average cost for counting a housing unit increased from about \$16 in 1970 to around \$92 in 2010 (in 2020 constant dollars). At the same time, the return of census questionnaires by mail (the primary mode of data collection) declined over this period from 78 percent in 1970 to 63 percent in 2010. Declining mail response rates have led to higher costs because the Bureau sends temporary workers to each non-responding household to obtain census data.

Achieving a complete and accurate census has become an increasingly daunting task, in part, because the population is growing larger, more diverse, and more reluctant to participate in the enumeration. In many ways, the Bureau has had to invest substantially more resources each decade to conduct the enumeration.

Figure 1: The Average Cost of Counting Each Housing Unit (in 2020 Dollars) Has Escalated Each Decade, While the Percentage of Mail Response Rates Has Declined



Source: GAO analysis of Census Bureau data. | GAO-19-588T

In addition to these external societal challenges that make achieving a complete count a daunting task, the Bureau also faces a number of internal management challenges that affect its capacity and readiness to conduct a cost-effective enumeration. Some of these issues—such as

acquiring and developing IT systems and preparing reliable cost estimates—are long-standing in nature.

At the same time, as the Bureau looks toward 2020, it has faced emerging and evolving uncertainties. For example, on March 26, 2018, the Secretary of Commerce announced his decision to add a question to the decennial census on citizenship status which resulted in various legislative actions⁶ and legal challenges.⁷ Ultimately, the case was heard by the U.S. Supreme Court, which, in a June 26, 2019, ruling, prevented the addition of the question because the Court found that the evidence Commerce provided in the case did not match the Secretary's explanation.⁸ In addition, the Fourth Circuit Court of Appeals remanded other legal challenges to the district court on June 24, 2019, for further legal action, which is yet to be resolved.⁹

According to Bureau officials, on June 28, 2019, Commerce asked the Bureau to put its scheduled July 1 start date for printing questionnaires on hold while it considered legal implications of the Supreme Court ruling. On July 2, 2019, Commerce told the Bureau to proceed with printing questionnaires and other materials without the citizenship question on them. As of July 5, 2019, the Department of Justice (DOJ) indicated that, although printing was continuing without the citizenship question, DOJ was evaluating legal options to include the question.¹⁰

⁶Commerce, Justice, Science, and Related Agencies Appropriations Act, 2020, H.R. 3055, § 534, 116th Cong. (passed June 25, 2019). Ensuring Full Participation in the Census Act of 2019, H.R. 1734, 116th Cong. (as introduced March 13, 2019); 2020 Census Accountability Act, H.R. 5292, 115th Cong. (as introduced March 15, 2018).

⁷See, e.g., *New York v. U.S. Dept. of Commerce*, No. 18-cv-2921, (S.D.N.Y. Jan. 15, 2019); *California v. Ross*, No. 18-cv-01865, (N.D. Cal. Mar. 6, 2019).

⁸*New York v. U.S. Dept. of Commerce*, U.S. No. 18-966 at *33 (2019). A majority of the Court held in favor of the government on whether the question was permitted under the Enumeration Clause of the Constitution and the Census Act, but remanded to the Southern District Court of New York for additional proceedings on the limited question of whether the administrative record demonstrated reasonable decision making.

⁹*La Union Del Pueblo Entero et al. v. Ross*; *Kravitz v. Department of Commerce*, No. 19-1382 (4th Cir.). These cases were remanded to the district court for evidence-gathering on the plaintiffs' equal protection claims.

¹⁰*Id.* DOJ, on behalf of Commerce, submitted a filing for this case on July 5, 2019 stating its intent to evaluate legal options for including the citizenship question.

On July 11, 2019, the President announced that instead of collecting this information from the census questionnaire, he ordered all federal agencies to provide data on citizenship status to Commerce using legally available federal records. We have not analyzed this decision or its implications, if any, for how the Bureau will tabulate its official counts. We will continue to monitor developments for Congress.

The Bureau also faced budgetary uncertainties that, according to the Bureau, led to the curtailment of testing in 2017 and 2018. However, the Consolidated Appropriations Act, 2018 appropriated for the Periodic Censuses and Programs account \$2.544 billion, which more than doubled the Bureau's request in the President's Fiscal Year 2018 Budget of \$1.251 billion.¹¹ According to the explanatory statement accompanying the act, the appropriation, which is available through fiscal year 2020, was provided to ensure the Bureau has the necessary resources to immediately address any issues discovered during operational testing, and to provide a smoother transition between fiscal year 2018 and fiscal year 2019.¹²

The availability of those resources enabled the Bureau to continue preparations for the 2020 Census during the 35 days in December 2018 to January 2019 when appropriations lapsed for the Bureau and a number of other federal agencies. Moreover, the Consolidated Appropriations Act, 2019 appropriated for the Periodic Censuses and Programs account \$3.551 billion.¹³ According to Bureau officials, this level of funding for fiscal year 2019 is sufficient to carry out 2020 Census activities as planned.

Importantly, the census is conducted against a backdrop of immutable deadlines. In order to meet the statutory deadline for completing the

¹¹Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, Division B, Title I (Mar. 23, 2018). Of the total appropriated for the Periodic Censuses and Programs account, \$2.095 billion was for the 2020 Census and \$213.6 million was for the American Community Survey.

¹²Joint explanatory statement of conference, 164 Cong. Rec. H2045, H2084 (daily ed. Mar. 22, 2018) (statement of Chairman Frelinghuysen), specifically referenced in section 4 of the Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, § 4 (Mar. 23, 2018).

¹³Consolidated Appropriations Act, 2019, Pub. L. No. 116-6, Division C, Title I (Feb. 15, 2019). Of the total appropriated for the Periodic Censuses and Programs account, \$3.015 billion was for the 2020 Census and \$211.4 million was for the American Community Survey.

enumeration, census activities need to take place at specific times and in the proper sequence.¹⁴ Thus, it is absolutely critical for the Bureau to stay on schedule. Figure 2 shows some dates for selected decennial events.

¹⁴13 U.S.C. § 141(b).

The Bureau Has Begun Opening Offices and Hiring Temporary Staff

The Bureau has begun to open its area census offices (ACO) for the 2020 Census. It has signed leases for all 248 ACOs, of which 39 of the offices will be open for the address canvassing operation set to begin in August 2019 where staff verifies the location of selected housing units. The remaining 209 offices will begin opening this fall. In 2010 the Bureau opened 494 census offices. The Bureau has been able to reduce its infrastructure because it is relying on automation to assign work and to record payroll. Therefore there is less paper—field assignments, maps, and daily payroll forms—to manually process.

For the 2020 Census, the Bureau is refining its recruiting and hiring goals, but tentatively plans to recruit approximately 2.24 million applicants and to hire over 400,000 temporary field staff from that applicant pool for two key operations: address canvassing, and nonresponse follow-up, where they visit households that do not return census forms to collect data in person. In 2010 the Bureau recruited 3.8 million applicants and hired 628,000 temporary workers to conduct the address canvassing and nonresponse follow-up field operations. According to Bureau officials, it has reduced the number of temporary staff it needs to hire because automation has made field operations more efficient and there is less paper. As of June 2019, the Bureau reported that for all 2020 Census operations it had processed about 430,000 applicants.

In addition, the Bureau was seeking to hire approximately 1,500 partnership specialists by the end of June 2019 to help increase census awareness and participation in minority communities and hard-to-reach populations. As of July 9, 2019, the Bureau's latest biweekly reporting indicated that it had hired 813 partnership specialists as of June 22, 2019. Moreover, as of July 10, 2019, Bureau officials told us that another 830 applicants were waiting to have their background checks completed. According to Bureau officials, hiring data are based on payroll dates generated biweekly, while background check data are tracked internally. Therefore, according to Bureau officials, more current hiring data were not available as of July 10, 2019 to indicate whether the Bureau had met its June 30 hiring goal.

Among other things, partnership specialists are expected to either provide or identify partners to help provide supplemental language support to respondents locally in over 100 different languages. We will continue to monitor the Bureau's progress in meeting its partnership specialist staffing goals and addressing any turnover that takes place. Hiring partnership specialists in a timely manner and maintaining adequate partnership specialist staffing levels are key to the Bureau's ability to

carry out its planned outreach efforts, especially to hard-to-count communities.

Moreover, Bureau officials also stated that the current economic environment (i.e., the low unemployment rate compared to the economic environment of the 2010 Census) has not yet impacted their ability to recruit staff. The Bureau will continue to monitor the impact of low unemployment on its ability to recruit and hire at the local and regional levels.

The Bureau Plans to Rely Heavily on IT for the 2020 Census

For the 2020 Census, the Bureau is substantially changing how it intends to conduct the census, in part by re-engineering key census-taking methods and infrastructure, and making use of new IT applications and systems. For example, the Bureau plans to offer an option for households to respond to the survey via the internet and enable field-based enumerators¹⁵ to use applications on mobile devices to collect survey data from households. To do this, the Bureau plans to utilize 52 new and legacy IT systems, and the infrastructure supporting them, to conduct the 2020 Census.

A majority of these 52 systems have been tested during operational tests in 2017 and 2018. For example, the Bureau conducted its 2018 End-to-End test, which included 44 of the 52 systems and was intended to test all key systems and operations in a census-like environment to ensure readiness for the 2020 Census.

Nevertheless, additional IT development and testing work needs to take place before the 2020 Census. Specifically, officials from the Bureau's Decennial Directorate said they expect that the systems will need to undergo further development and testing due to, among other things, the need to add functionality that was not part of the End-to-End test, scale system performance to support the number of respondents expected during the 2020 Census, and address system defects identified during the 2018 End-to-End test.

To prepare the systems and technology for the 2020 Census, the Bureau is also relying on substantial contractor support. For example, it is relying

¹⁵Enumerators are Census Bureau employees who travel from door-to-door throughout the country to try to obtain census data from individuals who do not respond through other means, including the internet, on paper, or by phone.

on contractors to develop a number of systems and components of the IT infrastructure, including the IT platform that is intended to be used to collect data from households responding via the internet and telephone, and for non-response follow-up activities. Contractors are also deploying the IT and telecommunications hardware in the field offices and providing device-as-a-service capabilities by procuring the mobile devices and cellular service to be used for non-response follow-up.¹⁶

In addition to the development of technology, the Bureau is relying on a technical integration contractor to integrate all of the key systems and infrastructure. The contractor's work is expected to include, among other things, evaluating the systems and infrastructure and acquiring the infrastructure (e.g., cloud or data center) to meet the Bureau's scalability and performance needs; integrating all of the systems; and assisting with technical, performance and scalability, and operational testing activities.

2020 Census Identified by GAO as a High-Risk Area

In February 2017, we added the 2020 Decennial Census as a high-risk area needing attention from Congress and the executive branch.¹⁷ This was due to significant risks related to, among other things, innovations never before used in prior enumerations,¹⁸ the acquisition and development of IT systems, and expected escalating costs.

Among other things, we reported that the commitment of top leadership was needed to ensure the Bureau's management, culture, and business practices align with a cost-effective enumeration. We also stressed that the Bureau needed to rigorously test census-taking activities; ensure that scheduling adheres to best practices; improve its ability to manage, develop, and secure its IT systems; and have better oversight and control over its cost estimation process.

¹⁶In non-response follow-up, if a household does not respond to the census by a certain date, the Bureau will send out employees to visit the home. The Bureau's plan is for these enumerators to use a census application, on a mobile device provided by the Bureau, to capture the information given to them by the in-person interviews.

¹⁷[GAO-17-317](#).

¹⁸The Bureau has fundamentally re-examined its approach for conducting the 2020 Census to help reduce costs. To do this, the agency plans to use innovations in four broad areas (described later in this statement): re-engineering field operations, using administrative records, verifying addresses in-office, and developing an Internet self-response option.

Our experience has shown that agencies are most successful at removal from our High-Risk List when leaders give top level attention to the five criteria for removal and Congress takes any needed action. The five criteria for removal that we identified in November 2000 are as follows:¹⁹

- **Leadership Commitment.** The agency has demonstrated strong commitment and top leadership support.
- **Capacity.** The agency has the capacity (i.e., people and resources) to resolve the risk(s).
- **Action Plan.** A corrective action plan exists that defines the root causes and solutions, and that provides for substantially completing corrective measures, including steps necessary to implement solutions we recommended.
- **Monitoring.** A program has been instituted to monitor and independently validate the effectiveness and sustainability of corrective measures.
- **Demonstrated Progress.** The agency has demonstrated progress in implementing corrective measures and in resolving the high-risk area.

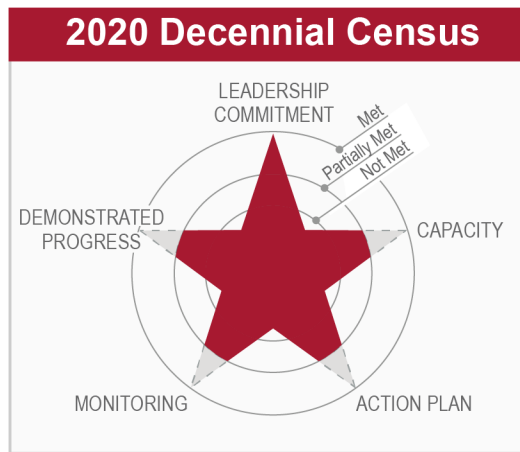
These five criteria form a road map for efforts to improve, and ultimately address, high-risk issues. Addressing some of the criteria leads to progress, while satisfying all of the criteria is central to removal from the list.

As we reported in the March 2019 high-risk report,²⁰ the Bureau's efforts to address the risks and challenges for the 2020 Census had fully met one of the five criteria for removal from the High-Risk List—leadership commitment—and partially met the other four, as shown in figure 3. Additional details about the status of the Bureau's efforts to address this high-risk area are discussed later in this statement.

¹⁹GAO, *Determining Performance and Accountability Challenges and High Risks*, [GAO-01-159SP](#) (Washington, D.C.: Nov. 1, 2000).

²⁰[GAO-19-157SP](#).

Figure 3: Status of High-Risk Area for the 2020 Decennial Census, as of March 2019



Source: GAO analysis. | GAO-19-588T

Note: Each point of the star represents one of the five criteria for removal from the High-Risk List and each ring represents one of the three designations: not met, partially met, or met. An unshaded point at the innermost ring means that the criterion has not been met, a partially shaded point at the middle ring means that the criterion has been partially met, and a fully shaded point at the outermost ring means that the criterion has been met.

The 2020 Census Remains High Risk Due to Challenges Facing the Enumeration

The 2020 Census is on our list of high-risk programs because, among other things, (1) innovations never before used in prior enumerations are not expected to be fully tested, (2) the Bureau continues to face challenges in implementing IT systems, (3) the Bureau faces significant cybersecurity risks to its systems and data, and (4) the Bureau's cost estimate for the 2020 Census was unreliable.²¹ If not sufficiently addressed, these risks could adversely impact the cost and quality of the enumeration. Moreover, the risks are compounded by other factors that contribute to the challenge of conducting a successful census, such as the nation's increasingly diverse population and concerns over personal privacy.

²¹ [GAO-17-317](#).

Key Risk #1: The Bureau Redesigned the Census to Control Costs, and Will Need to Take Several Actions to Better Manage Risks

The basic design of the enumeration—mail out and mail back of the census questionnaire with in-person follow-up for non-respondents—has been in use since 1970. However, a lesson learned from the 2010 Census and earlier enumerations is that this traditional design is no longer capable of cost-effectively counting the population.

In response to its own assessments, our recommendations, and studies by other organizations, the Bureau has fundamentally re-examined its approach for conducting the 2020 Census. Specifically, its plan for 2020 includes four broad innovation areas: re-engineering field operations, using administrative records, verifying addresses in-office, and developing an internet self-response option (see table 2).

If they function as planned, the Bureau initially estimated that these innovations could result in savings of over \$5 billion (in 2020 constant dollars) when compared to its estimates of the cost for conducting the census with traditional methods. However, in June 2016, we reported that the Bureau's initial life-cycle cost estimate developed in October 2015 was not reliable and did not adequately account for risk.²²

As discussed earlier in this statement, the Bureau has updated its estimate from \$12.3 billion and now estimates a life-cycle cost of \$15.6 billion, which would result in a smaller potential savings from the innovative design than the Bureau originally estimated. According to the Bureau, the goal of the cost estimate increase was to ensure quality was fully addressed.

²²GAO, *2020 Census: Census Bureau Needs to Improve Its Life-Cycle Cost Estimating Process*, [GAO-16-628](#) (Washington, D.C.: June 30, 2016).

Table 2: The Census Bureau (Bureau) Is Introducing Four Innovation Areas for the 2020 Census

Innovation area	Description
Re-engineered field operations	The Bureau intends to automate data collection methods, including its case management system.
Administrative records	In certain instances, the Bureau plans to reduce enumerator collection of data by using administrative records (information already provided to federal and state governments as they administer other programs such as, Medicare and Medicaid).
Verifying addresses in-office	To ensure the accuracy of its address list, the Bureau intends to use “in-office” procedures and on-screen imagery to verify addresses and reduce street-by-street field canvassing.
Internet self-response option	The Bureau plans to offer households the option of responding to the survey through the internet. The Bureau has not previously offered such an option on a large scale.

Source: GAO analysis of Census Bureau data. | GAO-19-588T

While the planned innovations could help control costs, they also introduce new risks, in part, because they include new procedures and technology that have not been used extensively in earlier decennials, if at all. Our prior work has shown the importance of the Bureau conducting a robust testing program, including the 2018 End-to-End test.²³ Rigorous testing is a critical risk mitigation strategy because it provides information on the feasibility and performance of individual census-taking activities, their potential for achieving desired results, and the extent to which they are able to function together under full operational conditions.

To address some of these challenges we have made numerous recommendations aimed at improving reengineered field operations, using administrative records, verifying the accuracy of the address list, and securing census responses via the internet.

The Bureau has held a series of operational tests since 2012, but according to the Bureau, it scaled back its most recent field tests because of funding uncertainties. For example, the Bureau canceled the field components of the 2017 Census Test including non-response follow-up, a

²³GAO, *2020 Census: Bureau Needs to Better Leverage Information to Achieve Goals of Reengineered Address Canvassing*, [GAO-17-622](#) (Washington, D.C.: July 20, 2017).

key census operation.²⁴ In November 2016, we reported that the cancelation of the 2017 Census Test was a lost opportunity to test, refine, and integrate operations and systems, and that it put more pressure on the 2018 End-to-End test to demonstrate that enumeration activities will function under census-like conditions as needed for 2020.

However, in May 2017, the Bureau scaled back the operational scope of the 2018 End-to-End test and, of the three planned test sites, only the Rhode Island site would fully implement the 2018 End-to-End test. The Washington and West Virginia sites would test just one field operation. In addition, due to budgetary concerns, the Bureau delayed ramp up and preparations for its coverage measurement operation (and the technology that supports it) from the scope of the test.²⁵ However, removal of the coverage measurement operation did not affect testing of the delivery of apportionment or redistricting data.

Without sufficient testing, operational problems can go undiscovered and the opportunity to improve operations will be lost, in part because the 2018 End-to-End test was the last opportunity to demonstrate census technology and procedures across a range of geographic locations, housing types, and demographic groups under decennial-like conditions prior to the 2020 Census.

We reported on the 2018 End-to-End test in December 2018 and noted that the Bureau had made progress addressing prior test implementation issues but still faced challenges.²⁶ As the Bureau studies the results of its testing to inform the 2020 Census, it will be important that it addresses key program management issues that arose during implementation of the test. Namely, by not aligning the skills, responsibilities, and information flows for the first-line supervisors during field data collection, the Bureau limited its role in support of enumerators within the re-engineered field operation.

²⁴In non-response follow-up, if a household does not respond to the census by a certain date, the Bureau will conduct an in-person visit by an enumerator to collect census data using a mobile device provided by the Bureau.

²⁵Coverage measurement evaluates the quality of the census data by estimating the census coverage based on a post-enumeration survey.

²⁶[GAO-19-140](#).

The Bureau Has Developed Hundreds of Risk Mitigation and Contingency Plans, but Those We Reviewed Were Missing Key Information

The Bureau also lacked mid-operation training or guidance, which, if implemented in a targeted, localized manner, could have further helped enumerators navigate procedural modifications and any commonly encountered problems when enumerating. It will be important for the Bureau to prioritize its mitigation strategies for these implementation issues so that it can maximize readiness for the 2020 Census.

To manage risk to the 2020 Census the Bureau has developed hundreds of risk mitigation and contingency plans. Mitigation plans detail how an agency will reduce the likelihood of a risk event and its impacts, if it occurs. Contingency plans identify how an agency will reduce or recover from the impact of a risk after it has been realized.

In May 2019, we reported that the Bureau had identified 360 active risks to the 2020 census as of December 2018—meaning the risk event could still occur and adversely impact the census.²⁷ Of these, 242 met the Bureau’s criteria for requiring a mitigation plan and, according to the Bureau’s risk registers, 232 had one (see table 3).²⁸ In addition, 146 risks met the Bureau’s criteria for requiring a contingency plan and, according to the Bureau’s risk registers, 102 had one.

Table 3: 2020 Census Risks with Required Mitigation and Contingency Plans, as of December 2018

Plan	Risks requiring plan	Risks with plan
Mitigation	242	232 (96%)
Contingency	146	102 (70%)

Source: GAO analysis of U.S. Census Bureau 2020 Census risk registers. | GAO-19-588T

Bureau guidance states that these plans should be developed as soon as possible after a risk is added to the risk register, but it does not establish a clear time frame for doing so. Consequently, some risks may go without required plans for extended periods. We found that, as of December 2018, some of the risks without required plans had been added to the Bureau’s risk registers in recent months, but others had been added more than 3 years earlier.

²⁷ [GAO-19-399](#).

²⁸ The Bureau’s risk registers catalogue information regarding all risks to the 2020 Census that the Bureau has identified, including risk descriptions, and mitigation and contingency plans.

We reviewed the mitigation and contingency plans in detail for six risks which the Bureau identified as among the major concerns that could affect the 2020 Census. These included cybersecurity incidents, late operational design changes, and integration of the 52 systems and 35 operations supporting the 2020 Census.

We found that the plans did not consistently include key information needed to manage the risk. For example, the Bureau's contingency plan for late operational design changes did not include activities specific to the three most likely late operational design changes—including removal of the citizenship question as a result of litigation or congressional action—that the Bureau could carry out to lessen their adverse impact on the enumeration, should they occur.

We found that gaps stemmed from either requirements missing from the Bureau's decennial risk management plan, or that risk owners—the individuals assigned to manage each risk—were not fulfilling all of their risk management responsibilities. Bureau officials said that risk owners are aware of these responsibilities but do not always fulfill them given competing demands.

Bureau officials also said that they are managing risks to the census, even if not always reflected in their mitigation and contingency plans. However, if such actions are reflected in disparate documents or are not documented at all, then decision makers are left without an integrated and comprehensive picture of how the Bureau is managing risks to the census.

We made seven recommendations to improve the Bureau's management of risks to the 2020 Census, including that the Bureau develop mitigation and contingency plans for all risks that require them, establish a clear time frame for plan development, and ensure that the plans have the information needed to manage the risk. Commerce agreed with our recommendations and said it would develop an action plan to address them.

Key Risk #2: The Bureau Faces Challenges in Implementing IT Systems

The Bureau Has Made Initial Progress against Its Revised Development and Testing Schedule, but Risks Missing Near-term Milestones

We have previously reported that the Bureau faces challenges in managing and overseeing IT programs, systems, and contractors supporting the 2020 Census.²⁹ Specifically, we have noted challenges in the Bureau's efforts to manage, among other things, the schedules and contracts for its systems. As a result of these challenges, the Bureau is at risk of being unable to fully implement the systems necessary to support the 2020 Census and conduct a cost-effective enumeration.

To help improve its implementation of IT for the 2020 Census, the Bureau revised its systems development and testing schedule. Specifically, in October 2018, the Bureau organized the development and testing schedule for its 52 systems into 16 operational deliveries.³⁰ Each of the 16 operational deliveries has milestone dates for, among other things, development, performance and scalability testing, and system deployment. According to Bureau officials in the Decennial Directorate, the schedule was revised, in part, due to schedule management challenges experienced, and lessons learned, while completing development and testing during the 2018 End-to-End test.

The Bureau has made initial progress in executing work against its revised schedule. For example, the Bureau completed development of the systems in the first operational delivery—for 2020 Census early operations preparations—in July 2018, and deployed these systems into production in October 2018.

However, our current work has determined that the Bureau is at risk of not meeting several near-term systems testing milestones. As of June 2019, 11 systems that are expected to be used in a total of five operational deliveries were at risk of not meeting key milestones for completing system development, performance and scalability testing,

²⁹GAO, *2020 Census: Further Actions Needed to Reduce Key Risks to a Successful Enumeration*, [GAO-19-431T](#) (Washington, D.C.: Apr. 30, 2019) and [GAO-18-655](#).

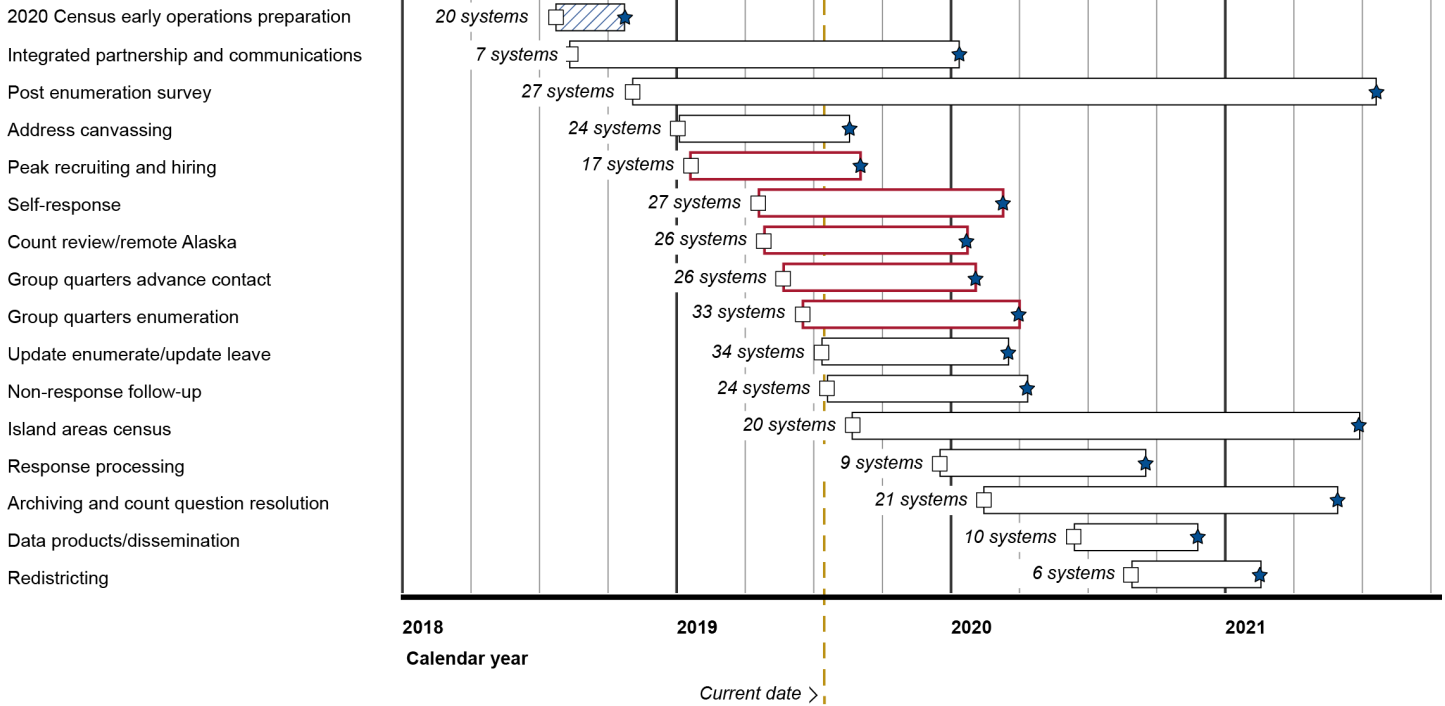
³⁰The 52 systems being used in the 2020 Census are to be deployed multiple times in a series of operational deliveries (which include operations such as address canvassing or self-response). That is, a system may be deployed for one operation in the 2020 Census (such as address canvassing), and be deployed again for a subsequent operation in the test (such as self-response). As such, additional development and testing may occur each time a system is deployed.





and/or integration testing.³¹ These 11 systems are needed for, among other things, data collection for operations, business and support automation, and customer support during self-response. Figure 4 presents an overview of the status for all 16 operational deliveries, as of June 2019.

³¹As of June 2019, the 11 systems were 2020 Website; Enterprise Census and Survey Enabling Platform-Operational Control System; Census Questionnaire Assistance; Automated Tracking and Control; Enterprise Census and Survey Enabling Platform-Internet Self-Response; Census Data Lake; Master Address File/Topologically Integrated Geographic Encoding and Referencing Database; MOJO Field Processing; Production Environment for Administrative Records Staging, Integration, and Storage; Self-Response Quality Assurance; and Unified Tracking System.

Figure 4: Status of 16 Operational Deliveries for the 2020 Census, as of June 2019

2020 Census operational deliveries



-  Deliveries that are in operation
-  At risk of meeting key milestones for completing system development, performance and scalability testing, and/or integration testing
-  Start of integration testing and end-to-end performance and scalability testing
-  Final system deployment

Source: GAO analysis of Census Bureau data. | GAO-19-588T

Note: The 52 systems being used in the 2020 Census are to be deployed multiple times in a series of operational deliveries (which include operations such as address canvassing or self-response). That is, a system may be deployed for one operation in the 2020 Census (such as address canvassing), and be deployed again for a subsequent operation in the test (such as self-response). As such, additional development and testing may occur each time a system is deployed.

The Bureau Faces Additional Risks Due to Compressed IT Development and Testing Time Frames

The at-risk systems previously discussed add uncertainty to a highly compressed time frame over the next 6 months. Importantly, between July and December 2019, the Bureau is expected to be in the process of integration testing the systems in 12 operational deliveries. Officials from the Bureau's integration contractor noted concern that the current schedule leaves little room for any delays in completing the remaining development and testing activities.

In addition to managing the compressed testing time frames, the Bureau also has to quickly finalize plans related to its IT infrastructure. For example, as of June 2019, the Bureau stated that it was still awaiting final approval for its Trusted Internet Connection.³² Given that these plans may impact systems being tested this summer or deployed into production for the address canvassing operation in August 2019, it is important that the Bureau quickly addresses this matter.

Our past reporting noted that the Bureau faced significant challenges in managing its schedule for system development and testing that occurred in 2017 and 2018.³³ We reported that, while the Bureau had continued to make progress in developing and testing IT systems for the 2020 Census, it had experienced delays in developing systems to support the 2018 End-to-End test. These delays compressed the time available for system and integration testing and for security assessments.

In addition, several systems experienced problems during the test. We noted then, and reaffirm now, that continued schedule management challenges may compress the time available for the remaining system and integration testing and increase the risk that systems may not function or be as secure as intended.

The Bureau has acknowledged that it faces risks to the implementation of its systems and technology. As of May 2019, the Bureau had identified 17 high risks related to IT implementation that may have substantial technical and schedule impacts if realized. Taken together, these risks represent a cross-section of issues, such as schedule delays for a fraud-

³²External network traffic (traffic that is routed through agency's external connections) must be routed through a Trusted Internet Connection. External connections include those connections between an agency's information system or network and the globally-addressable internet or a remote information system or network and networks located on foreign territory.

³³[GAO-18-655](#).

detection system, the effects of late changes to technical requirements, the need to ensure adequate time for system development and performance and scalability testing, contracting issues, privacy risks, and skilled staffing shortages. Going forward, it will be important that the Bureau effectively manages these risks to better ensure that it meets near-term milestones for system development and testing, and is ready for the major operations of the 2020 Census.

Key Risk #3: The Bureau Faces Significant Cybersecurity Risks to Its Systems and Data

The risks to IT systems supporting the federal government and its functions, including conducting the 2020 Census, are increasing as security threats continue to evolve and become more sophisticated. These risks include insider threats from witting or unwitting employees, escalating and emerging threats from around the globe, and the emergence of new and more destructive attacks. Underscoring the importance of this issue, we have designated information security as a government-wide high-risk area since 1997 and, in our most recent biennial report to Congress, ensuring the cybersecurity of the nation was one of nine high-risk areas that we reported needing especially focused executive and congressional attention.³⁴

Our prior and ongoing work has identified significant challenges that the Bureau faces in securing systems and data for the 2020 Census.³⁵ Specifically, the Bureau has faced challenges related to completing security assessments, addressing security weaknesses, resolving cybersecurity recommendations from DHS, and addressing numerous other cybersecurity concerns (such as phishing).³⁶

The Bureau Has Made Progress in Completing Security Assessments, but Critical Work Remains

Federal law specifies requirements for protecting federal information and information systems, such as those systems to be used in the 2020 Census. Specifically, the Federal Information Security Management Act of 2002 and the Federal Information Security Modernization Act of 2014 (FISMA) require executive branch agencies to develop, document, and implement an agency-wide program to provide security for the information

³⁴[GAO-19-157SP](#).

³⁵[GAO-19-431T](#) and [GAO-18-655](#).

³⁶Phishing is a digital form of social engineering that uses authentic-looking, but fake emails to request information from users or direct them to a fake website that requests information.

and information systems that support operations and assets of the agency.³⁷

In accordance with FISMA, National Institute of Standards and Technology (NIST) guidance, and Office of Management and Budget (OMB) guidance, the Bureau's Office of the Chief Information Officer (CIO) established a risk management framework. This framework requires system developers to ensure that each of the Bureau's systems undergoes a full security assessment, and that system developers remediate critical deficiencies.

According to the Bureau's risk management framework, the systems expected to be used to conduct the 2020 Census will need to have complete security documentation (such as system security plans) and an approved authorization to operate prior to their use. As of June 2019, according to the Bureau's Office of the CIO:

- Thirty-seven of the 52 systems have authorization to operate, and will not need to be reauthorized before they are used in the 2020 Census³⁸
- Nine of the 52 systems have authorization to operate, and will need to be reauthorized before they are used in the 2020 Census
- Five of the 52 systems do not have authorization to operate, and will need to be authorized before they are used in the 2020 Census
- One of the 52 systems does not need an authorization to operate.³⁹

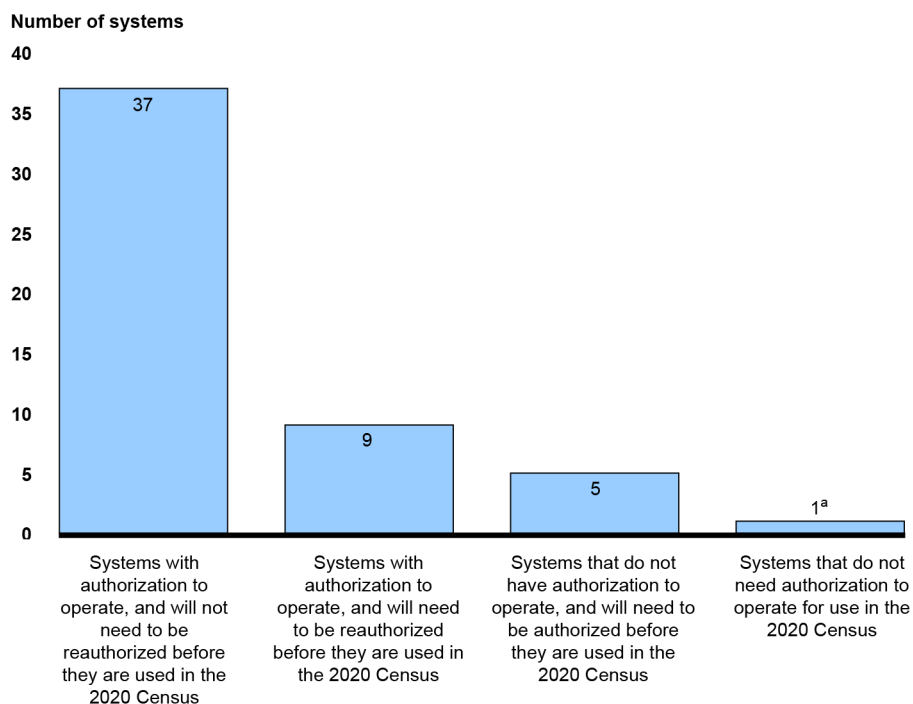
³⁷The Federal Information Security Modernization Act of 2014, Pub. L. No. 113-283, 128 Stat. 3073 (Dec. 18, 2014) largely superseded the Federal Information Security Management Act of 2002, enacted as Title III, E-Government Act of 2002, Pub. L. No. 107-347, 116 Stat. 2899, 2946 (Dec. 17, 2002).

³⁸According to the Bureau's risk management framework, once a system obtains an authorization, it is transitioned to the continuous monitoring process where the authorizing official can provide ongoing authorization for system operation as long as the risk level remains acceptable. Further, according to the framework, authorized systems do not need a formal reauthorization unless the system's authorizing official determines that the risk posture of the system needs to change. This could occur, for example, if the system undergoes significant new development.

³⁹According to a June 2019 Bureau memorandum, one system—OneForm Designer Plus—is expected to primarily be used during the 2020 Census as a desktop tool for generating fillable forms. The memorandum further states that, because this system is considered a desktop tool, the Bureau's information security policy does not require it to obtain an authorization to operate.

Figure 5 summarizes the authorization to operate status for the systems being used in the 2020 Census, as reported by the Bureau in June 2019.

Figure 5: Authorization to Operate Status for the 52 Systems Being Used by the Census Bureau in the 2020 Census, as Reported by the Bureau in June 2019



Source: GAO analysis of Census Bureau data. | GAO-19-588T

^aAccording to the Bureau, one system is expected to primarily be used during the 2020 Census as a desktop tool for generating fillable forms and the Bureau's information security policy does not require desktop tools to obtain an authorization to operate.

As we have previously reported, while large-scale technological changes (such as internet self-response) increase the likelihood of efficiency and effectiveness gains, they also introduce many cybersecurity challenges. The 2020 Census also involves collecting personally identifiable information (PII) on over a hundred million households across the country, which further increases the need to properly secure these systems. Thus, it will be important that the Bureau provides adequate time to perform these security assessments, completes them in a timely manner, and ensures that risks are at an acceptable level before the systems are deployed. We have ongoing work examining how the Bureau plans to address both internal and external cyber threats, including its

The Bureau Has Identified a Significant Number of Corrective Actions to Address Security Weaknesses, but Has Not Always Been Timely in Completing Them

efforts to complete system security assessments and resolve identified weaknesses.

FISMA requires that agency-wide information security programs include a process for planning, implementing, evaluating, and documenting remedial actions (i.e., corrective actions) to address any deficiencies in the information security policies, procedures, and practices of the agency.⁴⁰ Additionally, the Bureau's framework requires it to track security assessment findings that need to be remediated as a plan of action and milestones (POA&M). These POA&Ms are expected to provide a description of the vulnerabilities identified during the security assessment that resulted from a control weakness.

As of the end of May 2019, the Bureau had over 330 open POA&Ms to remediate for issues identified during security assessment activities, including ongoing continuous monitoring. Of these open POA&Ms, 217 (or about 65 percent) were considered "high-risk" or "very high-risk."

While the Bureau established POA&Ms for addressing these identified security control weaknesses, it did not always complete remedial actions in accordance with its established deadlines. For example, of the 217 open "high-risk" or "very high-risk" POA&Ms we reviewed, the Bureau identified 104 as being delayed. Further, 74 of the 104 had missed their scheduled completion dates by 60 or more days. According to the Bureau's Office of Information Security, these POA&Ms were identified as delayed due to technical challenges or resource constraints to remediate and close them.

We previously recommended that the Bureau take steps to ensure that identified corrective actions for cybersecurity weaknesses are implemented within prescribed time frames.⁴¹ As of late May 2019, the Bureau was working to address our recommendation. Until the Bureau resolves identified vulnerabilities in a timely manner, it faces an increased risk, as continuing opportunities exist for unauthorized individuals to exploit these weaknesses and gain access to sensitive information and systems.

⁴⁰The Federal Information Security Modernization Act of 2014, Pub. L. No. 113-283, 128 Stat. 3073 (Dec. 18, 2014).

⁴¹[GAO-19-431T](#).

The Bureau Is Working with DHS to Improve Its 2020 Census Cybersecurity Efforts, but Lacks a Formal Process to Address DHS’s Recommendations

The Bureau is working with federal and industry partners, including DHS, to support the 2020 Census cybersecurity efforts. Specifically, the Bureau is working with DHS to ensure a scalable and secure network connection for the 2020 Census respondents (e.g., virtual Trusted Internet Connection with the cloud), improve its cybersecurity posture (e.g., risk management processes and procedures), and strengthen its response to potential cyber threats (e.g., federal cyber incident coordination).

Federal law describes practices for strengthening cybersecurity by documenting or tracking corrective actions. As previously mentioned, FISMA requires executive branch agencies to establish a process for planning, implementing, evaluating, and documenting remedial actions to address any deficiencies in their information security policies, procedures, and practices. *Standards for Internal Control in the Federal Government* calls for agencies to establish effective internal control monitoring that includes a process to promptly resolve the findings of audits and other reviews.⁴² Specifically, agencies should document and complete corrective actions to remediate identified deficiencies on a timely basis. This would include correcting identified deficiencies or demonstrating that the findings and recommendations do not warrant agency action.

Since January 2017, DHS has been providing cybersecurity assistance (including issuing recommendations) to the Bureau in preparation for the 2020 Census. Specifically, DHS has been providing cybersecurity assistance to the Bureau in five areas:

- management coordination and executive support, including a CyberStat Review;⁴³
- cybersecurity threat intelligence and information sharing enhancement through, among other things, a DHS cyber threat briefing to the Bureau’s leadership;
- network and infrastructure security and resilience, including National Cybersecurity Protection System (also called EINSTEIN) support;⁴⁴

⁴²GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

⁴³According to OMB, CyberStat Reviews are face-to-face, evidence-based meetings intended to ensure agencies are accountable for their cybersecurity posture. OMB, DHS, and Commerce participated in the Fiscal Year 2017 CyberStat Review related to the Bureau.

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- incident response and management readiness through a Federal Incident Response Evaluation assessment;⁴⁵ and
 - risk management and vulnerability assessments for specific high value assets provided by the Bureau.⁴⁶

In the last 2 years, DHS has provided 42 recommendations to assist the Bureau in strengthening its cybersecurity efforts.⁴⁷ Among other things, the recommendations pertained to strengthening cyber incident management capabilities, penetration testing⁴⁸ and web application assessments of select systems, and phishing assessments to gain access to sensitive PII. Of the 42 recommendations, 10 recommendations resulted from DHS's mandatory services for the Bureau (e.g., risk management and vulnerability assessments for specific high value assets). The remaining 32 recommendations resulted from DHS's voluntary services for the Bureau (e.g., Federal Incident Response Evaluation assessment). Due to the sensitive nature of the recommendations, we are not identifying the specific recommendations or specific findings associated with them in this statement.

In April 2019, we reported that the Bureau had not established a formal process for documenting, tracking, and completing corrective actions for

⁴⁴The National Cybersecurity Protection System, operationally known as the EINSTEIN program, is an integrated system-of-systems that is intended to deliver a range of capabilities, including intrusion detection, intrusion prevention, analytics, and information sharing. This program was developed to be one of the tools to aid federal agencies in mitigating information security threats.

⁴⁵As part of the CyberStat Review, DHS conducted a Federal Incident Response Evaluation assessment in October 2017. The purpose of the assessment was, in part, to review the Bureau's incident management practices and provide recommendations that, if addressed, would strengthen the Bureau's cybersecurity efforts.

⁴⁶According to OMB, high value assets are those assets (such as federal information systems, information, and data) for which an unauthorized access, use, disclosure, disruption, modification, or destruction could cause a significant impact.

⁴⁷Although all of the recommendations from DHS are intended to assist the Bureau to improve its overall cybersecurity efforts, a recommendation may not explicitly indicate that there is a specific vulnerability. However, a recommendation may identify an area where the Bureau's cybersecurity capabilities could be strengthened.

⁴⁸The National Institute of Standards and Technology defined penetration testing as security testing in which the evaluators mimic real-world attacks in an attempt to identify ways to circumvent the security features of an application, system, or network. Penetration testing often involves issuing real attacks on real systems and data, using the same tools and techniques used by actual attackers.

The Bureau Faces Several Other Cybersecurity Challenges in Implementing the 2020 Census

all of the recommendations provided by DHS.⁴⁹ Accordingly, we recommended that the Bureau implement a formal process for tracking and executing appropriate corrective actions to remediate cybersecurity findings identified by DHS. As of late May 2019, the Bureau was working to address our recommendation.

Until the Bureau implements our recommendation, it faces an increased likelihood that findings identified by DHS will go uncorrected and may be exploited to cause harm to agency's 2020 Census IT systems and gain access to sensitive respondent data. Implementing a formal process would also help to ensure that DHS's efforts result in improvements to the Bureau's cybersecurity posture.

The Bureau faces other substantial cybersecurity challenges in addition to those previously discussed. More specifically, we previously reported that the extensive use of IT systems to support the 2020 Census redesign may help increase efficiency, but that this redesign introduces critical cybersecurity challenges.⁵⁰ These challenges include those related to the following:

- **Phishing.** We have previously reported that advanced persistent threats may be targeted against social media web sites used by the federal government. In addition, attackers may use social media to collect information and launch attacks against federal information systems through social engineering, such as phishing.⁵¹ Phishing attacks could target respondents, as well as Bureau employees and contractors. The 2020 Census will be the first one in which respondents will be heavily encouraged to respond via the internet. This will likely increase the risk that cyber criminals will use phishing in an attempt to steal personal information. According to the Bureau, it plans to inform the public of the risks associated with phishing through its education and communication campaigns.

⁴⁹[GAO-19-431T](#).

⁵⁰GAO, *Information Technology: Better Management of Interdependencies between Programs Supporting 2020 Census Is Needed*, [GAO-16-623](#) (Washington, D.C.: Aug. 9, 2016) and *Information Technology: Uncertainty Remains about the Bureau's Readiness for a Key Decennial Census Test*, [GAO-17-221T](#) (Washington, D.C.: Nov. 16, 2016).

⁵¹GAO, *Social Media: Federal Agencies Need Policies and Procedures for Managing and Protecting Information They Access and Disseminate*, [GAO-11-605](#) (Washington, D.C.: June 28, 2011).

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- **Disinformation from social media.** We previously reported that one of the Bureau's key innovations for the 2020 Census is the large-scale implementation of an internet self-response option. The Bureau is encouraging the public to use the internet self-response option through expanded use of social media. However, the public perception of the Bureau's ability to adequately safeguard the privacy and confidentiality of the 2020 Census internet self-responses could be influenced by disinformation spread through social media.

According to the Bureau, if a substantial segment of the public is not convinced that the Bureau can safeguard public response data against data breaches and unauthorized use, then response rates may be lower than projected, leading to an increase in cases for follow-up and subsequent cost increases. To help address this challenge, the Bureau stated that it plans to inform the public of the risks associated with disinformation from social media through its education and communication campaigns.

- **Ensuring that individuals gain only limited and appropriate access to 2020 Census data.** The Bureau plans to enable a public-facing website and Bureau-issued mobile devices to collect PII (e.g., name, address, and date of birth) from the nation's entire population—estimated to be over 300 million. In addition, the Bureau is planning to obtain and store administrative records containing PII from other government agencies to help augment information that enumerators did not collect.

The number of reported security incidents involving PII at federal agencies has increased dramatically in recent years. Because of these challenges, we have recommended, among other things, that federal agencies improve their response to information security incidents and data breaches involving PII, and consistently develop and implement privacy policies and procedures. Accordingly, it will be important for the Bureau to ensure that only respondents and Bureau officials are able to gain access to this information, and enumerators and other employees only have access to the information needed to perform their jobs.

- **Ensuring adequate control in a cloud environment.** The Bureau has decided to use cloud solutions as a key component of the 2020 Census IT infrastructure. We have previously reported that cloud computing has both positive and negative information security implications and, thus, federal agencies should develop service-level agreements with cloud providers.

These agreements should specify, among other things, the security performance requirements—including data reliability, preservation, privacy, and access rights—that the service provider is to meet.⁵² Without these safeguards, computer systems and networks, as well as the critical operations and key infrastructures they support, may be lost; information—including sensitive personal information—may be compromised; and the agency’s operations could be disrupted.

Commerce’s Office of the Inspector General recently identified several challenges the Bureau may face using cloud-based systems to support the 2020 Census.⁵³ Specifically, in June 2019, the Office of the Inspector General identified, among other things, unimplemented security system features that left critical 2020 Census systems vulnerable during the 2018 End-to-End Test and a lack of fully implemented security practices to protect certain data hosted in the 2020 Census cloud environment. Officials from the Bureau agreed with all eight of the Office of Inspector General’s recommendations regarding 2020 Census cloud-based systems and identified actions taken to address them.

- **Ensuring contingency and incident response plans are in place to encompass all of the IT systems to be used to support the 2020 Census.**

Because of the brief time frame for collecting data during the 2020 Census, it is especially important that systems are available for respondents to ensure a high response rate.

Contingency planning and incident response help ensure that, if normal operations are interrupted, network managers will be able to detect, mitigate, and recover from a service disruption while preserving access to vital information.

Implementing important security controls, including policies, procedures, and techniques for contingency planning and incident response, helps to ensure the confidentiality, integrity, and availability of information and systems, even during disruptions of service. Without contingency and incident response plans, system availability might be impacted and result in a lower response rate.

⁵²GAO, *Information Security: Agencies Need to Improve Cyber Incident Response Practices*, [GAO-14-354](#) (Washington, D.C.: Apr. 30, 2014).

⁵³U.S. Department of Commerce, Office of Inspector General, *The Census Bureau Must Correct Fundamental Cloud Security Deficiencies in Order to Better Safeguard the 2020 Decennial Census*, [OIG-19-015-A](#) (Washington, D.C.: June 19, 2019).

The Bureau's CIO has acknowledged these cybersecurity challenges and is working to address them, according to Bureau documentation. In addition, we have ongoing work looking at many of these challenges, including the Bureau's plans to protect PII, use a cloud-based infrastructure, and recover from security incidents and other disasters.









Key Risk #4: The Bureau Will Need to Control Any Further Cost Growth and Develop Cost Estimates That Reflect Best Practices






Since 2015, the Bureau has made progress in improving its ability to develop a reliable cost estimate. We have reported on the reliability of the \$12.3 billion life-cycle cost estimate released in October 2015 and the \$15.6 billion revised cost estimate released in October 2017.⁵⁴ In 2016 we reported that the October 2015 version of the Bureau's life-cycle cost estimate for the 2020 Census was not reliable. Specifically, we found that the 2020 Census life-cycle cost estimate partially met two of the characteristics of a reliable cost estimate (comprehensive and accurate) and minimally met the other two (well-documented and credible). We recommended that the Bureau take specific steps to ensure its cost estimate meets the characteristics of a high-quality estimate. The Bureau agreed and has taken action to improve the reliability of the cost estimate.

In August 2018 we reported that while improvements had been made, the Bureau's October 2017 cost estimate for the 2020 Census did not fully reflect all the characteristics of a reliable estimate. (See figure 6.)

⁵⁴[GAO-16-628](#) and GAO, *2020 Census: Census Bureau Improved the Quality of Its Cost Estimation but Additional Steps Are Needed to Ensure Reliability*, [GAO-18-635](#) (Washington, D.C.: Aug. 17, 2018).

Figure 6: Overview of the Census Bureau’s 2015 and 2017 Cost Estimates Compared to Characteristics of a Reliable Cost Estimate

Characteristic	2015 Assessment	2017 Assessment
Well-Documented	 Minimally met	 Partially met
Accurate	 Partially met	 Substantially met
Credible	 Minimally met	 Substantially met
Comprehensive	 Partially met	 Met

 Met
  Substantially met
  Partially met
  Minimally met
  Not met

Source: GAO analysis of Census Bureau data. | GAO-19-588T

In order for a cost estimate to be deemed reliable as described in GAO’s Cost Estimating and Assessment Guide⁵⁵ and thus, to effectively inform 2020 Census annual budgetary figures, the cost estimate must meet or substantially meet the following four characteristics:

- **Well-Documented.** Cost estimates are considered valid if they are well-documented to the point they can be easily repeated or updated and can be traced to original sources through auditing, according to best practices.
- **Accurate.** Accurate estimates are unbiased and contain few mathematical mistakes.
- **Credible.** Credible cost estimates must clearly identify limitations due to uncertainty or bias surrounding the data or assumptions, according to best practices.

⁵⁵GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* (Supersedes [GAO-07-1134SP](#)), [GAO-09-3SP](#) (Washington, D.C.: Mar. 2, 2009).

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- **Comprehensive.** To be comprehensive an estimate should have enough detail to ensure that cost elements are neither omitted nor double-counted, and all cost-influencing assumptions are detailed in the estimate's documentation, among other things, according to best practices.

The 2017 cost estimate only partially met the characteristic of being well-documented. In general, some documentation was missing, inconsistent, or difficult to understand. Specifically, we found that source data did not always support the information described in the basis of estimate document or could not be found in the files provided for two of the Bureau's largest field operations: Address Canvassing and Non-Response Follow-Up. We also found that some of the cost elements did not trace clearly to supporting spreadsheets and assumption documents.

Failure to document an estimate in enough detail makes it more difficult to replicate calculations, or to detect possible errors in the estimate; reduces transparency of the estimation process; and can undermine the ability to use the information to improve future cost estimates or even to reconcile the estimate with another independent cost estimate. The Bureau told us it would continue to make improvements to ensure the estimate is well-documented.

Increased Costs Are Driven by an Assumed Decrease in Self-Response Rates and Increases in Contingency Funds and IT Cost Categories

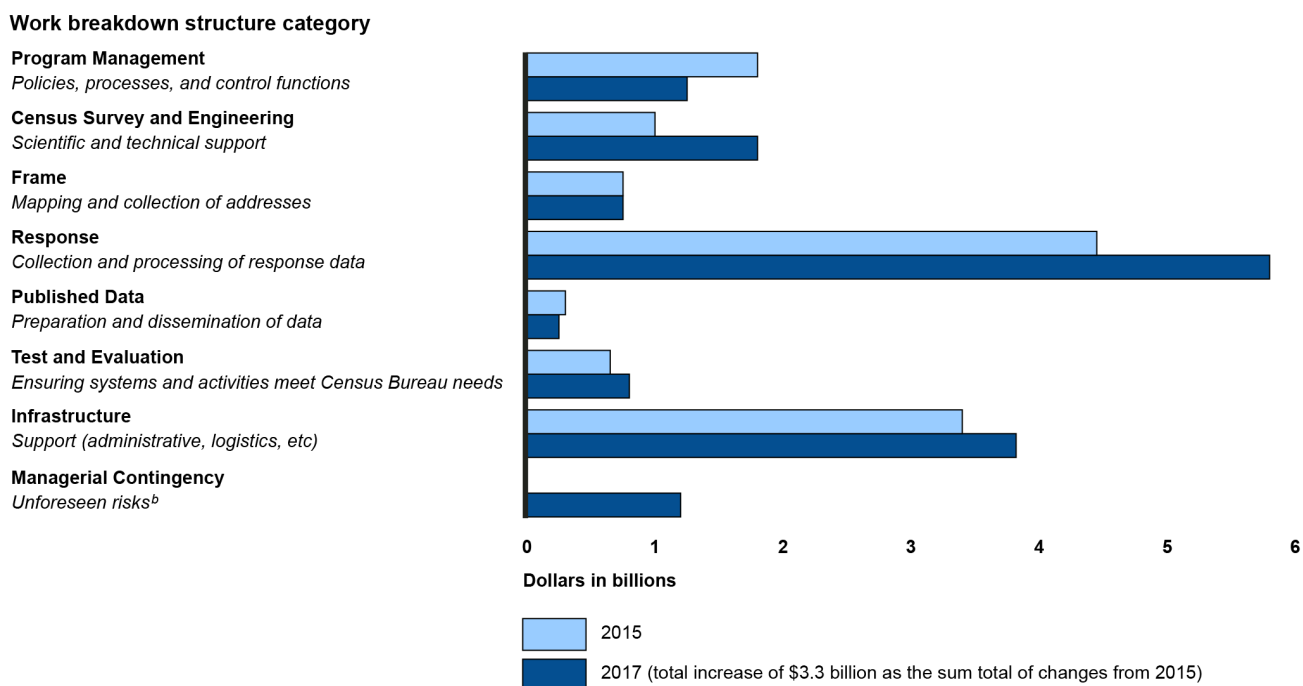
The 2017 life-cycle cost estimate includes much higher costs than those included in the 2015 estimate. The largest increases occurred in the Response, Managerial Contingency, and Census/Survey Engineering categories. For example, increased costs of \$1.3 billion in the response category (costs related to collecting, maintaining, and processing survey response data) were in part due to reduced assumptions for self-response rates, leading to increases in the amount of data collected in the field, which is more costly to the Bureau.

Contingency allocations increased overall from \$1.35 billion in 2015 to \$2.6 billion in 2017, as the Bureau gained a greater understanding of risks facing the 2020 Census. Increases of \$838 million in the Census/Survey Engineering category were due mainly to the cost of an IT contract for integrating decennial survey systems that was not included in the 2015 cost estimate. Bureau officials attribute a decrease of \$551 million in estimated costs for Program Management to changes in the categorization of costs associated with risks.

Specifically, in the 2017 version of the estimate, estimated costs related to program risks were allocated to their corresponding work breakdown

structure (WBS) element. Figure 7 shows the change in cost by WBS category for 2015 and 2017.

Figure 7: Change in 2020 Census Cost Estimate by Work Breakdown Structure Category, 2015 vs. 2017^a



Source: GAO analysis of Census Bureau data. | GAO-19-588T

^aThe historical life-cycle cost figures for prior decennials as well as the initial estimate for 2020 provided by Commerce in October 2017 differ slightly from those reported by the Bureau previously. According to Commerce documents, the more recently reported figures are “inflated to the current 2020 Census time frame (fiscal years 2012 to 2023),” rather than to constant 2020 dollars as the earlier figures had been. Specifically, since October 2017, Commerce and the Bureau have reported the October 2015 estimate for the 2020 Census as \$12.3 billion; this is slightly different from the \$12.5 billion the Bureau had initially reported.

^bThe 2015 cost estimate also included managerial contingency amounts totaling \$829 million; however, these were not presented as a separate work breakdown structure category.

More generally, factors that contributed to cost fluctuations between the 2015 and 2017 cost estimates include:

- **Changes in assumptions.** Among other changes, a decrease in the assumed rate for self-response from 63.5 percent in 2015 to 60.5 percent in 2017 increased the cost of collecting responses from nonresponding housing units.

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- **Improved ability to anticipate and quantify risk.** In general, contingency allocations designed to address the effects of potential risks increased overall from \$1.3 billion in 2015 to \$2.6 billion in 2017.
 - **An overall increase in IT costs.** IT cost increases, totaling \$1.59 billion, represented almost 50 percent of the total cost increase from 2015 to 2017.
 - **More defined contract requirements.** Bureau documents described an overall improvement in the Bureau’s ability to define and specify contract requirements. This resulted in updated estimates for several contracts, including for the Census Questionnaire Assistance contract.⁵⁶

However, while the Bureau has been able to better quantify risk; in August 2018 we also reported that the Secretary of Commerce included a contingency amount of about \$1.2 billion in the 2017 cost estimate to account for what the Bureau refers to as “unknown unknowns.” According to Bureau documentation these include such risks as natural disasters or cyber attacks. The Bureau provides a description of how the risk contingency for “unknown unknowns” is calculated; however, this description does not clearly link calculated amounts to the risks themselves. Thus, only \$14.4 billion of the Bureau’s \$15.6 billion cost estimate has justification.

According to Bureau officials, the cost estimate remains at \$15.6 billion; however, they stated that they are managing the 2020 Census at a lower level of funding—\$14.1 billion. In addition, they said that, at this time, they do not plan to request funding for the \$1.2 billion contingency fund for unknown unknowns or \$369 million in funding for selected discrete program risks for what-if scenarios, such as an increase in the wage rate or additional supervisors needed to manage field operations. Instead of requesting funding for these contingencies upfront the Bureau plans to work with OMB and Commerce to request additional funds, if the need arises.

According to Bureau officials they anticipate that the remaining \$1.1 billion in contingency funding included in the \$14.1 billion will be sufficient

⁵⁶This contract has two primary functions: to provide (1) questionnaire assistance by telephone and email for respondents by answering questions about the census in general and regarding specific items on the census form, and (2) an option for respondents to complete a census interview over the telephone.

to carry out the 2020 Census. In June 2016 we recommended the Bureau improve control over how risk and uncertainty are accounted for. This prior recommendation remains valid given the life-cycle cost estimate still includes the \$1.2 billion unjustified contingency fund for “unknown unknowns”.

Moreover, given the cost growth between 2015 and 2017 it will be important for the Bureau to monitor cost in real-time, as well as, document, explain and review variances between planned and actual cost. In August 2018 we reported that the Bureau had not been tracking variances between estimated life-cycle costs and actual expenses. Tools to track variance enable management to measure progress against planned outcomes and will help inform the 2030 Census cost estimate. Bureau officials stated that they already have systems in place that can be adapted for tracking estimated and actual costs. We will continue to monitor the status of the tracking system.

According to Bureau officials, the Bureau planned to release an updated version of the 2020 Census life-cycle estimate in the spring of 2019; however, they had not done so as of June 28, 2019. To ensure that future updates to the life-cycle cost estimate reflect best practices, it will be important for the Bureau to implement our recommendation related to the cost estimate.

Continued Management Attention Needed to Keep Preparations on Track and Help Ensure a Cost- Effective Enumeration

2020 Challenges Are Symptomatic of Deeper Long-Term Organizational Issues

The difficulties facing the Bureau’s preparation for the decennial census in such areas as planning and testing; managing and overseeing IT programs, systems, and contractors supporting the enumeration; developing reliable cost estimates; prioritizing decisions; managing schedules; and other challenges, are symptomatic of deeper organizational issues.

Following the 2010 Census, a key lesson learned for 2020 that we identified was ensuring that the Bureau's organizational culture and structure, as well as its approach to strategic planning, human capital management, internal collaboration, knowledge sharing, capital decision-making, risk and change management, and other internal functions are aligned toward delivering more cost-effective outcomes.⁵⁷

The Bureau has made improvements over the last decade, and continued progress will depend in part on sustaining efforts to strengthen risk management activities, enhancing systems testing, bringing in experienced personnel to key positions, implementing our recommendations, and meeting regularly with officials from its parent agency, Commerce.

Going forward, we have reported that the key elements needed to make progress in high-risk areas are top-level attention by the administration and agency officials to (1) leadership commitment, (2) ensuring capacity, (3) developing a corrective action plan, (4) regular monitoring, and (5) demonstrated progress. Although important steps have been taken in at least some of these areas, overall, far more work is needed.⁵⁸ We discuss three of five areas below.

The Secretary of Commerce has successfully demonstrated leadership commitment. For example, the Bureau and Commerce have strengthened this area with executive-level oversight of the 2020 Census by holding regular meetings on the status of IT systems and other risk areas. In addition, in 2017 Commerce designated a team to assist senior Bureau management with cost estimation challenges. Moreover, on January 2, 2019, a new Director of the Census Bureau took office, a position that had been vacant since June 2017.

With regard to capacity, the Bureau has improved the cost estimation process of the decennial when it established guidance including:

- roles and responsibilities for oversight and approval of cost estimation processes,

⁵⁷GAO, *2010 Census: Preliminary Lessons Learned Highlight the Need for Fundamental Reforms*, [GAO-11-496T](#) (Washington, D.C.: Apr. 6, 2011).

⁵⁸[GAO-17-317](#).

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- procedures requiring a detailed description of the steps taken to produce a high-quality cost estimate, and
 - a process for updating the cost estimate and associated documents over the life of a project.

However, the Bureau continues to experience skills gaps in the government program management office overseeing the \$886 million contract for integrating the IT systems needed to conduct the 2020 Census. Specifically, as of June 2019, 14 of 44 positions in this office were vacant.

For the monitoring element, we found to track performance of decennial census operations, the Bureau relied on reports to track progress against pre-set goals for a test conducted in 2018. According to the Bureau, these same reports will be used in 2020 to track progress. However, the Bureau's schedule for developing IT systems during the 2018 End-to-End test experienced delays that compressed the time available for system testing, integration testing, and security assessments. These schedule delays contributed to systems experiencing problems after deployment, as well as cybersecurity challenges. In the months ahead, we will continue to monitor the Bureau's progress in addressing each of the five elements essential for reducing the risk to a cost-effective enumeration.

Further Actions Needed on Our Recommendations

Over the past several years we have issued numerous reports that underscored the fact that, if the Bureau was to successfully meet its cost savings goal for the 2020 Census, the agency needed to take significant actions to improve its research, testing, planning, scheduling, cost estimation, system development, and IT security practices. As of June 2019, we have made 106 recommendations related to the 2020 Census. The Bureau has implemented 74 of these recommendations, 31 remain open, and one recommendation was closed as not implemented.

Of the 31 open recommendations, 9 were directed at improving the implementation of the innovations for the 2020 Census. Commerce generally agreed with our recommendations and is taking steps to implement them. Moreover, in April 2019 we wrote to the Secretary of Commerce, providing a list of the 12 open 2020-Census-related recommendations that we designated as "priority."⁵⁹ Priority

⁵⁹The 12 priority recommendations originated in reports we issued from November 2009 to December 2018.

recommendations are those recommendations that we believe warrant priority attention from heads of key departments and agencies.

We believe that attention to these recommendations is essential for a cost-effective enumeration. The recommendations included implementing reliable cost estimation and scheduling practices in order to establish better control over program costs, as well as taking steps to better position the Bureau to develop an internet response option for the 2020 Census.

In addition to our recommendations, to better position the Bureau for a more cost-effective enumeration, on March 18, 2019, we met with OMB, Commerce, and Bureau officials to discuss the Bureau's progress in reducing the risks facing the census. We also meet regularly with Bureau officials and managers to discuss the progress and status of open recommendations related to the 2020 Census, which has resulted in Bureau actions in recent months leading to closure of some recommendations.

We are encouraged by this commitment by Commerce and the Bureau in addressing our recommendations. Implementing our recommendations in a complete and timely manner is important because it could improve the management of the 2020 Census and help to mitigate continued risks.

In conclusion, while the Bureau has made progress in revamping its approach to the census, it faces considerable challenges and uncertainties in implementing key cost-saving innovations and ensuring they function under operational conditions; managing the development and testing of its IT systems; ensuring the cybersecurity of its systems and data; and developing a quality cost estimate for the 2020 Census and preventing further cost increases. For these reasons, the 2020 Census is a GAO high-risk area.

Going forward, continued management attention and oversight will be vital for ensuring that risks are managed, preparations stay on track, and the Bureau is held accountable for implementing the enumeration, as planned. Without timely and appropriate actions, the challenges previously discussed could adversely affect the cost, accuracy, schedule, and security of the enumeration. We will continue to assess the Bureau's efforts and look forward to keeping Congress informed of the Bureau's progress.

Chairman Johnson, Ranking Member Peters, and Members of the Committee, this completes our prepared statement. We would be pleased to respond to any questions that you may have.

GAO Contacts and Staff Acknowledgments

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