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November 7, 2024

The Honorable Jeanne Shaheen Chair The Honorable Jerry Moran Ranking Member Subcommittee on Commerce, Justice, Science, and Related Agencies Committee on Appropriations United States Senate

The Honorable Hal Rogers Chairman The Honorable Matt Cartwright Ranking Member Subcommittee on Commerce, Justice, Science, and Related Agencies Committee on Appropriations House of Representatives

Population Estimates: Results of the Census Bureau's Challenge Program

Between decennial censuses, the Census Bureau's Population Estimates Program (PEP) annually disseminates population and housing unit estimates for the country at various levels of geography.¹ These annual population estimates are used by state, local, and tribal governments to allocate federal funds, among other purposes. The Bureau refers to each population estimate series as a "vintage." For example, Vintage 2022 covers April 1, 2020, through July 1, 2022.

The Population Estimates Challenge Program (PECP) provides state and local governments the ability to challenge annual population estimates. The Bureau paused the PECP to support the 2020 Census (as it usually does) and reinstated it in November 2022. The Bureau released the first set of results from the PECP for Vintage 2022 on February 28, 2024. State or local governments (governmental units) may challenge their population estimate by submitting data to the Bureau for evaluation or by identifying a technical error in processing input data or in producing the estimates.

A House Report that accompanied the Commerce, Justice, Science, and Related Agencies Appropriations Bill 2023 includes a provision for us to review the Census Bureau's efforts and provide a briefing within 180 days of the Bureau completing its related work on the PECP.² This

¹Annual population estimates are authorized by 13 U.S.C. §181, which requires, to the extent feasible, the production of "current data on total population and population characteristics" for each state, county, and local unit of generalpurpose government which has a population of 50,000 or more. The Bureau produces population estimates of the United States, its states, metropolitan and micropolitan statistical areas, counties, cities, and towns, as well as for the Commonwealth of Puerto Rico and its municipios. Additionally, the Bureau produces demographic components of population change (births, deaths, and migration) and housing unit estimates at the national, state, and county levels of geography.

²Committee on Appropriations, H.R. Rep. No. 117-395, at 19 (2022).

report summarizes the briefing and (1) describes changes that were made to the PEP and the PECP following the release of 2020 Census data, as well as other changes being considered; and (2) describes the first set of PECP results that were released in February 2024.

To address the first objective, we reviewed the Bureau's documentation of key components of the PEP and PECP methodology changes following the 2020 Census, including the use of flexible methodologies and administrative records. We also reviewed the *Federal Register* notice that addressed public comments received for making changes to the PECP, and we interviewed Bureau officials about relevant information contained in the *Federal Register* notice.³ Additionally, we interviewed Bureau officials about ongoing research and testing for the PEP and PECP. To address the second objective, we reviewed Bureau guidance to understand the process for submitting a challenge and analyzed the Vintage 2022 PECP results. We interviewed Bureau officials to understand the rationale for accepting some challenges but not others.

Our review is limited to Vintage 2022, which was the first series of population estimates governmental units could challenge following the 2020 Census. We conducted this performance audit from April 2024 to October 2024 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 findings and conclusions based on our audit objectives.

On August 26, 2024, we briefed your staff on the preliminary results of this study. This report formally conveys the information provided during this briefing, as summarized below (see enclosure I for the briefing slides).

• PEP and PECP changes. The Bureau revised its methodology for producing annual population estimates to address challenges with 2020 Census data. Typically, the Bureau develops the estimates using a long-standing methodology that relies on the latest decennial census results as the population base or starting point. However, several challenges limited the Bureau's ability to use 2020 Census results as the population base for annual estimates. These challenges included delays in the availability of 2020 Census data due to the COVID-19 pandemic and additional procedures to protect the confidentiality of data. In response to those challenges, the Bureau developed a "blended" base for the annual population estimates. This blended base contained 2020 Census national, state, and county population counts, national 2020 Demographic Analysis estimates by age and sex, and Vintage 2020 population estimates by age, sex, race, and Hispanic origin.⁴

According to Bureau officials, there are about 10 ongoing research projects to improve the annual population and housing unit estimates, some of which are multiyear projects. For example, in January 2024, the Bureau prioritized research into improving the estimates of the foreign-born population. The research relies on assessing and monitoring administrative data sources that may enable the Bureau to adjust for large fluctuations in the inflow of migrants. Some sources of administrative data being examined are from, for example, the Departments of Justice and Homeland Security. Moreover, in March 2022 the Bureau

³See 88 Fed. Reg. 17696 (Mar. 24, 2023).

⁴Demographic Analysis (DA) estimates are developed from current and historical vital records, estimates of international migration, and Medicare records. The DA estimates are independent from the 2020 Census.

convened a team to monitor and improve the blended base methodology. Prior to each vintage, this team's recommendations on the blended base are provided to the public as part of a PEP webinar on annual methodology updates.

The Bureau solicited and incorporated feedback from the public to improve the PECP. The Bureau announced in the *Federal Register* how it was incorporating the feedback it received in public comments. The notice addressed the feedback in the following ways:

- Governmental units are not limited to submitting a challenge digitally. They may still submit a physical copy of the challenge paperwork to the Bureau.
- The notice encourages the appropriate Federal-State Cooperative for Population Estimates (FSCPE) members to work with local governments while the FSCPE members review prerelease estimates.⁵

According to the public comments, governmental units want the Bureau to accept more data sources when a challenge is submitted. Bureau officials said they are open to accepting more data sources for challenges that are supported by research. They stated research must be conducted before any changes are made to the PECP and they are conducting research that could expand the scope of the PECP.

 Challenge results. The Bureau revised population estimates in response to seven challenges made through the PECP. For Vintage 2022, governmental units submitted 12 challenges, according to the Bureau. These included two county-level challenges and 10 subcounty-level challenges.⁶ The Bureau did not accept the two county-level challenges because they were incomplete.⁷ Feedback was given to the two counties that did not meet Bureau requirements. In both cases, the Bureau received a revised submission, but the counties still did not meet the Bureau's guidelines.

Bureau officials said that three of the 10 challenges submitted by subcounty areas were not accepted.⁸ Two of the 10 governmental units decided their challenges did not contain significant changes and withdrew them. The third subcounty submission did not meet the Bureau's challenge requirements and therefore the challenge was not accepted. For Vintage 2022, population estimates as of July 1, 2022, of the seven challenges accepted, all localities saw their population change in the direction they expected, Bureau officials said. Five saw their populations increase and two saw their populations decrease.

⁵Federal-State Cooperative for Population Estimates members, designated by their respective governors, work in cooperation with PEP to produce population and housing unit estimates. Any prerelease data shared with governmental units must adhere to data confidentiality requirements.

⁶There are 3,144 county or county-equivalents and there are over 78,000 subcounty areas in the United States.

⁷Counties can challenge components of the annual population estimate including births, deaths, migration, and changes in the group quarters population.

⁸Subcounty areas, including cities and towns, can challenge population estimates based on changes in an area's housing stock. This can be measured by building permits, nonpermitted construction, certificates of occupancy, housing conversions, demolitions and housing loss, mobile home placements, and the group quarters population.

Agency Comments

We provided a draft of this report to the Department of Commerce for its review and comment. The Bureau provided technical comments, which we incorporated as appropriate.

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

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

Sincerely yours,

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Yvonne D. Jones Director, Strategic Issues

Enclosures - 2



Review of the Census Bureau's Population Estimates Challenge Program

Briefing for

Subcommittee on Commerce, Justice, Science, and Related Agencies, Committee on Appropriations, House of Representatives

Subcommittee on Commerce, Justice, Science, and Related Agencies, Committee on Appropriations, United States Senate



Briefing Overview

- Summary of Findings
- Background
- Mandate Summary
- Objectives for This Review
- Findings
- Scope and Methodology



Summary of Findings

Population Estimates Program (PEP): The Census Bureau revised its methodology for producing annual population estimates to address challenges with 2020 Census data, due in part to delays resulting from the COVID-19 pandemic. To develop annual population estimates, the Bureau created a blended base by using other sources of data in addition to 2020 Census data. According to Bureau officials, there are about 10 ongoing research projects to improve the annual population estimates.

Population Estimates Challenge Program (PECP): State and local governments can challenge the population estimates produced by the Bureau. In response to feedback in a *Federal Register* notice, the Bureau is retaining the flexibility to accept a physical copy of challenge material and is encouraging the appropriate Federal-State Cooperative for Population Estimates members to engage local governments.



Summary of Findings

Challenge Reviews Resulted in Some Revisions to Population Estimates

- For Vintage 2022, 12 challenges were submitted—two county-level and 10 subcounty-level challenges.
- Neither of the two county-level challenges met PECP requirements and the Bureau did not accept them. According to the Bureau, the counties submitted incomplete documentation, and the Bureau provided feedback to both counties. For context, as of June 2023 there were 3,144 county or county-equivalents.
- Out of the 10 subcounty-level challenges, two localities withdrew their challenges, and one subcounty challenge did not meet the Bureau's requirements and was not accepted. There are over 78,000 subcounty areas, according to Bureau officials.
- The Bureau accepted the remaining seven challenges. According to the Bureau, all seven subcounty jurisdictions saw their populations change in the direction they expected.



Background

- The PEP is responsible for annually disseminating official measures of population and housing unit estimates. The annual time series of estimates begins with the most recent decennial census. State, local, and tribal governments use the estimates to allocate federal funds, among other purposes.
- The Bureau refers to each estimate series as a "vintage." For example, Vintage 2022 covers April 1, 2020, through July 1, 2022. The Bureau releases estimates to its website on a rolling basis, generally starting in December with data such as national and state total population estimates and ending in June with data such as county population estimates by age, sex, race, and Hispanic origin.
- The PECP provides state and local governments the ability to challenge annual population estimates produced by the Bureau.



Background

- The Bureau paused the PECP to support the 2020 Census (as it usually does) and reinstated it in November 2022. The Bureau released the first set of results from the PECP for Vintage 2022 (April 1, 2020, through July 1, 2022) on February 28, 2024.
- The Review Guide for the PECP provides guidance on submitting a challenge. See <u>https://www.census.gov/programs-surveys/popest/about/challenge-program/guide.html</u>.
- State or local governments (governmental units) may challenge their population estimate by submitting data to the Bureau for evaluation or by identifying a technical error in processing input data or in producing the estimates. To begin the process, governmental units can request documentation from the Bureau for the various components (e.g., births, deaths) used to create the government's population estimate.



Mandate Summary

Commerce, Justice, Science, and Related Agencies Appropriations Bill 2023, House Report 117-395 which accompanies H.R. 8256

- Congress directed that as the Bureau reinstates the PECP this decade, the Bureau should consider more flexible methodologies and broader use of administrative data to ensure meaningful opportunities to improve the accuracy of the estimates, including appropriate improvements to the estimates base.
- Congress includes a provision for us to review the Bureau's efforts and brief the committee within 180 days of the Bureau completing its related work on the PECP.



Objectives for This Review

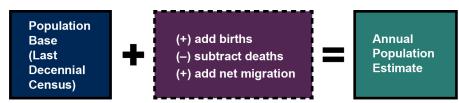
- 1. Describe the changes that were made to the PEP and the PECP following the release of 2020 Census data, as well as other changes being considered.
- 2. Describe the first set of PECP results that were released in February 2024.



PEP: The Bureau Revised Its Methodology to Address Challenges with Using 2020 Census Data

Typically, the Bureau develops its annual population estimates using a long-standing methodology that relies on the latest decennial census results as the population base or starting point. Figure 1 shows the key components of the Bureau's typical methodology to develop annual population estimates for the nation, states, counties, and Puerto Rico prior to the 2020 Census.

Figure 1: Census Bureau's Methodology to Develop Annual Population Estimates (2020 and Prior Years)



Source: GAO analysis of U.S. Census Bureau documentation. | GAO-25-107503

However, the Bureau encountered several challenges, including delays in the availability of 2020 Census data due to the COVID-19 pandemic and additional procedures to protect the confidentiality of data.



PEP: The Blended Population Base Integrates Data from Three Sources

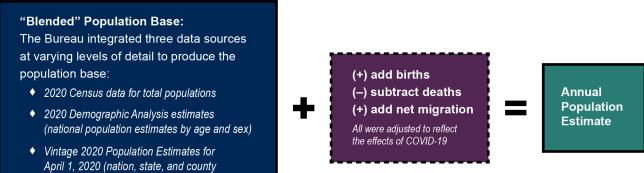
In response to those challenges, the Bureau developed a "blended" base for the annual population estimates. The Vintage 2022 blended base consists of:

- 2020 Census Data: National, state, and county total population counts using 2022 geographical boundaries, including populations living in group quarters (places where people live or stay in a group living arrangement, such as university housing).
- 2020 Demographic Analysis (DA) Estimates: National population estimates by age and sex (DA estimates are developed from current and historical vital records, estimates of international migration, and Medicare records. The DA estimates are independent from the 2020 Census).
- Vintage 2020 Population Estimates for April 1, 2020: Nation, state, and county population estimates by age, sex, race, and Hispanic origin.



PEP: The Blended Population Base Integrates Data from Three Sources

Figure 2: Census Bureau's "Blended" Population Base Methodology to Develop Annual Population Estimates (Vintage 2022)



Source: GAO analysis of U.S. Census Bureau documentation, | GAO-25-107503

population estimates by age and sex, race,

and Hispanic origin).



PEP: A Bureau Research Team Monitors Blended Base Methodology and Recommends Changes

- To monitor and improve the blended population base methodology, in March 2022 the Bureau convened the Base Evaluation and Research Team (BERT). This team includes subject matter experts from across the Bureau.
- Prior to the start of each new vintage, the Bureau, via a public webinar, provides a methodology update, summary of recommendations, and any associated effects on the blended population base from the research conducted by BERT.
- For example, during a December 2023 webinar, Bureau officials highlighted an approved recommendation to include the use of the Hispanic origin resident population totals from the 2020 Census for the blended population base.



PEP: Additional Research Aims to Improve the Population Estimates

- According to Bureau officials, there are about 10 ongoing research projects to improve the annual population and housing unit estimates, some of which are multiyear projects.
- For example, in January 2024, the Bureau prioritized research into improving the estimates of the foreign-born population. The research relies on assessing and monitoring administrative data sources that may enable the Bureau to adjust for large fluctuations in the inflow of migrants.
- Some sources of administrative data being examined are from, for example, the Departments of Justice and Homeland Security.



PEP: Additional Research Aims to Improve the Population Estimates

- The Bureau is also comparing two methods for estimating county-level populations.
- The **Housing Unit Method**, according to Bureau officials, assumes that change in the household population for an area is driven by change in the number of housing units along with the area's occupancy rate and average household size. According to Bureau officials, this method is used for estimating the population in cities and towns and the Bureau would like to assess its validity for updating annual county-level population estimates.
- The **Cohort-Component Method**, which the Bureau currently uses to estimate county population, updates the population estimates base by using changes in births, deaths, and migration. According to Bureau officials, the cohort-component method has consistently provided accurate county-level population estimates when compared to data from the decennial censuses over recent decades.
- According to Bureau officials, it will use the research on the Housing Unit Method that began in February 2024 to determine which method is most appropriate.



PEP: The Bureau Is Hiring New Staff to Research Improvements to the Population and Housing Unit Estimates

According to Bureau officials, the Bureau's fiscal year 2024 appropriation included funding sufficient to support hiring 17 additional staff to expand research capacity and improve the annual population and housing unit estimates. According to Bureau officials, it received that funding in March 2024 and immediately began hiring.

According to Bureau officials, the hiring process for permanent positions can take many months. To ensure that research projects get started, the Bureau began hiring temporary employees (not to exceed 130 days). Permanent employees will not be hired to fill the positions held by temporary employees until temporary employees have departed.



PEP: The Bureau Is Hiring New Staff to Research Improvements to the Population and Housing Estimates

Figure 3 depicts the status of the 17 new positions allotted for improving the annual population and housing unit estimates as of August 2024.

Figure 3: New Bureau Positions Added in Fiscal Year 2024

Positions	Number of Positions	
Permanent Positions Filled	10	
Temporary Positions Filled	3	
Positions Yet to be Filled	4	
Total	17	

GAO analysis of U.S. Census Bureau data. | GAO-24-107503

The Bureau plans to fill all temporary and unfilled positions with permanent staff by spring 2025.



PECP: The Bureau Solicited Feedback to Improve PECP

In response to public comments received concerning changes to the PECP, the Bureau announced in the *Federal Register* (88 Fed. Reg. 17696 (Mar. 24, 2023)) that it is:

- retaining the flexibility to accept a physical copy of challenge material, instead of requiring all digital submissions; and
- increasing communication with governments by encouraging the appropriate Federal-State Cooperative for Population Estimates (FSCPE) members to engage with local governments during the FSCPE members' review of prerelease estimates, to the extent possible given data confidentiality requirements. FSCPE members are designated by their respective governors to work with the Bureau on producing population and housing unit estimates.



PECP: The Bureau Solicited Feedback on How to Improve PECP

- In response to public comments to expand the PECP to accept more data sources from governmental units when a challenge is submitted, Bureau officials stated that they are open to expanding the scope of PECP, to the extent that research supports such expansion.
- According to the Bureau, any changes to the PECP must be researched to support the development of accurate estimates and to ensure equity for all governmental units.
- Moreover, Bureau officials told us they are currently researching possible ways to increase the types of administrative data used in the development of housing unit estimates, which would expand the scope of the PECP.



According to Bureau officials for Vintage 2022, 12 challenges were submitted to the PECP. There were two county-level challenges and 10 subcounty-level challenges. For context, as of July 2023, there are 3,144 county or county-equivalents (borough, independent city, or parish) in the United States.

- Counties can challenge components of the annual population estimate including births, deaths, migration, and a change in the group quarter population.
- According to Bureau officials, neither of the two county challenges met PECP requirements and thus were not accepted. According to the Bureau, the documentation submitted was incomplete, and feedback was provided to both counties.



- Subcounty areas, such as cities and towns, can challenge population estimates based on changes in an area's housing stock, such as building permits, nonpermitted construction, certificates of occupancy, housing conversions, demolitions and housing loss, mobile home placements, and the group quarter population. There are over 78,000 subcounty areas in the United States.
- According to Bureau officials, out of the 10 subcounty challenges, two localities withdrew their challenges after deciding that their recalculations did not constitute a significant change. The Bureau also found another subcounty submission did not meet the Bureau's requirements and was not accepted.



- The Bureau accepted the remaining seven subcounty area challenges.
- According to the Bureau, all seven of the jurisdictions saw their populations change in the direction they expected.
- Most experienced an increase in their population estimates ranging from 0.13 percent to just under 2 percent. Two jurisdictions saw their populations decrease. For example, for July 1, 2022, Berlin, Massachusetts, experienced an almost 20 percent decrease in its population.
- On the next two slides, figure 4 depicts changes to the July 1, 2022, population, and figure 5 depicts changes to the July 1, 2021, population based on challenges to the Vintage 2022 population estimates.



Figure 4: Accepted Challenges to Vintage 2022 Population Estimates as of July 1, 2022

Area	State	Original 7/1/2022 Population Estimate	Revised 7/1/2022 Population Estimate	Difference in Population Estimates	Percentage Change
Chicago city	IL	2,665,039	2,672,678	7,639	0.29%
Berlin town	MA	4,189	3,365	-824	-19.67%
Detroit city	МІ	620,376	625,561	5,185	0.84%
Grand Rapids city	МІ	196,908	197,203	295	0.15%
Bernalillo town	NM	9,898	9,078	-820	-8.28%
Garland city	тх	240,854	245,643	4,789	1.99%
Cottonwood Heights city	UT	32,420	32,489	69	0.21%

GAO analysis of U.S. Census Bureau data. | GAO-24-107503



Figure 5: Accepted Challenges to Vintage 2022 Population Estimates as of July 1, 2021

Area	State	Original 7/1/2021 Population Estimate	Revised 7/1/2021 Population Estimate	Difference in Population Estimates	Percentage Change
Chicago city	IL	2,698,029	2,703,302	5,273	0.20%
Berlin town	MA	3,678	3,289	-389	-10.58%
Detroit city	МІ	628,167	630,637	2,470	0.39%
Bernalillo town	NM	9,540	9,117	-423	-4.43%
Garland city	тх	242,189	244,136	1,947	0.80%
Cottonwood Heights city	UT	32,865	32,907	42	0.13%

GAO analysis of U.S. Census Bureau data. | GAO-24-107503

While PECP was not resumed for Vintage 2021, localities were allowed to challenge the July 1, 2021, estimates contained in the Vintage 2022 estimates.



Scope and Methodology

Our review is limited to Vintage 2022 which was the first vintage the Bureau allowed governmental units to challenge following the 2020 Census. Those results were released on February 28, 2024.

To address the first objective, we

- reviewed the Bureau's documentation of key components of the PEP and PECP methodology changes following the 2020 Census, including the use of flexible methodologies and administrative records;
- reviewed the *Federal Register* notice that addressed public comments received for making changes to the PECP and interviewed Bureau officials about relevant information contained in the *Federal Register* notice; and
- interviewed Bureau officials about ongoing research and testing for the PEP and PECP.



Scope and Methodology

To address the second objective, we

- reviewed Bureau guidance to understand the process for submitting a challenge;
- reviewed the Bureau's documentation for the Vintage 2022 PECP results; and
- interviewed Bureau officials to understand the rationale for accepting some challenges but not others.

We shared a copy of the slides with the Bureau. The Bureau provided technical comments, which we incorporated, as appropriate. Page 25

GAO-25-107503 Population Estimates

GAO Contact and Staff Acknowledgments

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In addition to the contact named above, Lisa Pearson (Assistant Director), Erik Shive (Analystin-Charge), Mark Abraham, Mike Bechetti, Virginia Chanley, Robert Gebhart, Jyoti Gupta, Sheila R. McCoy, Emily Tucker, Tim Wexler, and Peter Verchinski assisted with this engagement.

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