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Report to Congressional Addressees

February 2024

MATERNAL HEALTH

HHS Should Improve Assessment of Efforts to Address Worsening Outcomes

Accessible Version

GAO-24-106271

GAO Highlights

View GAO-24-106271. For more information, contact Alyssa M. Hundrup at (202) 512-7114 or hundrupa@gao.gov.
Highlights of GAO-24-106271, a report to congressional addressees
February 2024

MATERNAL HEALTH

HHS Should Improve Assessment of Efforts to Address Worsening Outcomes

Why GAO Did This Study

The U.S. is experiencing a maternal health crisis: it has one of the highest maternal mortality rates among high-income nations; increasing rates of complications from pregnancy or childbirth; and persistent disparities in such outcomes, according to HHS. GAO previously reported that the COVID-19 pandemic exacerbated maternal health outcomes and highlighted racial disparities.

The CARES Act includes a provision for GAO to report on its COVID-19 pandemic oversight efforts. GAO was also asked to review maternal health during the pandemic. Among other things, this report describes what available HHS data show about maternal health during COVID-19, and examines the extent to which HHS agencies have incorporated key practices to assess the performance of selected HHS maternal health efforts. GAO selected efforts based on factors such as the number of states in which teams implement the efforts. GAO reviewed HHS data for various years from 2016 through 2022 (based on availability), reviewed agency documentation, compared efforts against key practices, and interviewed HHS officials and stakeholders.

What GAO Recommends

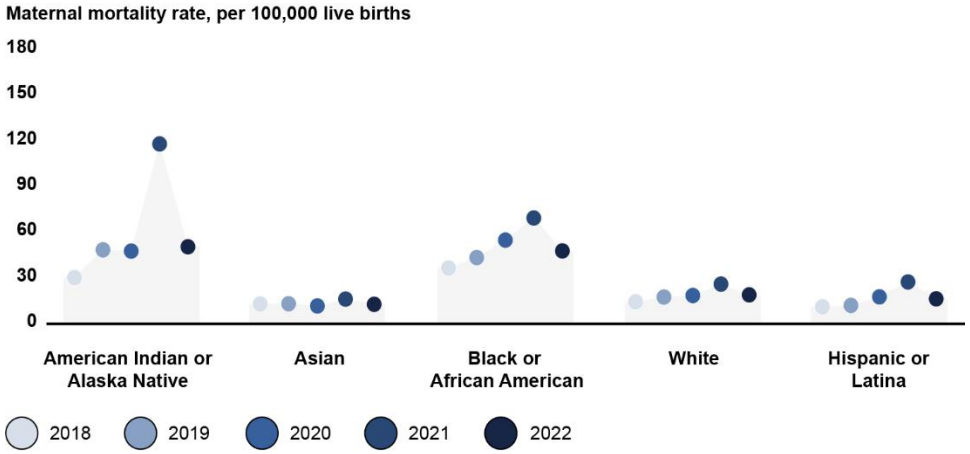
GAO is making two recommendations that (1) HHS ensure the *Maternal Health Blueprint's* performance measurement strategy follows key practices; and (2) CDC establish quantitative targets for the Perinatal Quality Collaborative program's near-term goals. HHS concurred with GAO's recommendations and noted plans to address them.

What GAO Found

Maternal mortality and other adverse outcomes associated with pregnancy or childbirth worsened significantly in 2020 and 2021, as compared with 2018 and 2019, according to Department of Health and Human Services (HHS) data. Disparities in maternal health outcomes persisted during the pandemic for certain groups. For example, the maternal mortality rate among non-Hispanic, Black or African American women was about 2.5 times greater than

non-Hispanic, White women during these years, according to GAO's analysis of HHS data.

Maternal Mortality by Race and Ethnicity, 2018 – 2022



Source: GAO analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics data. | GAO-24-106271

Accessible Data for Maternal Mortality by Race and Ethnicity, 2018 – 2022

Race/Ethnicity	2018	2019	2020	2021	2022
American Indian or Alaska Native	30.9	49.2	48.5	118.7	51.2
Asian	13.3	13.8	12.3	16.8	13.3
Black	37.3	44.0	55.3	69.9	48.4
White	14.9	17.9	19.1	26.6	19.4
Hispanic	11.8	12.6	18.2	28.0	16.9

Source: GAO analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics data. I GAO-24-106271

Notes: A maternal death is the death of a woman that occurs during or within 42 days of pregnancy from any cause related to or aggravated by the pregnancy or its management. All racial groups are not Hispanic or Latina; Hispanic or Latina women may be of any race.

The *White House Blueprint for Addressing the Maternal Health Crisis* was released in June 2022 in response to worsening outcomes and disparities. It highlights specific federal actions and outlines long-term goals for improving maternal health. HHS offices intend to develop a strategy for assessing the performance of these long-term goals. However, as of September 2023, HHS had not indicated whether the strategy will include key practices, such as establishing near-term goals and performance measures, to track the performance of their efforts. Doing so would allow HHS to better assess its efforts to improve maternal health.

The blueprint also identifies key maternal health efforts, such as the Centers for Disease Control and Prevention's (CDC) Perinatal Quality Collaborative program, which supports multidisciplinary teams implementing maternal health quality improvement initiatives. The CDC program has both long- and near-term goals, but the near-term goals lack quantitative targets, such as targets specifying the anticipated number of facilities participating in the Perinatal Quality Collaborative program. Establishing such targets would allow CDC to assess the program's progress to help improve maternal health outcomes.

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Abbreviations

AIM	Alliance for Innovation on Maternal Health
CDC	Centers for Disease Control and Prevention
HHS	Department of Health and Human Services
HRSA	Health Resources and Services Administration
PQC	Perinatal Quality Collaboratives

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U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

February 21, 2024

Congressional Addressees

The U.S. faces a maternal mortality crisis, with mortality rates that exceed every other high-income country. For example, in 2019, the maternal mortality rate in the U.S. (20.1 maternal deaths per 100,000 live births) was more than two times greater than Canada (7.5) and more than five times greater than Australia (3.9).[1] Further, research shows that an increasing number of women experience other adverse maternal health outcomes, such as severe maternal morbidity and mental health conditions, including postpartum depressive symptoms.[2] There are also persistent racial disparities in maternal health outcomes in the U.S. For example, data from the Centers for Disease Control and Prevention (CDC) show that non-Hispanic, Black or African American (Black) women

[1]According to the World Health Organization, a maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. The maternal mortality rate is the number of maternal deaths per 100,000 live births. The maternal mortality rates for other countries are reported in Organization for Economic Cooperation and Development, *Health Status: Maternal and Infant Mortality*, accessed September 22, 2023, https://stats.oecd.org/index.aspx?queryid=30116.

We use the term "women" in this report based on definitions in the data sources, but acknowledge this term does not include all people who may become pregnant, such as people who do not identify as either male or female, and some transgender men.

[2]See, for example, A. Hirai et al., "Trends in Severe Maternal Morbidity in the U.S. Across the Transition to ICD-10-CM/PCS From 2012-2019," *Jama Network Open*, vol. 5, no. 7 (July 28, 2022); B.L. Bauman et al., "Vital Signs: Postpartum Depressive Symptoms and Provider Discussions About Perinatal Depression—United States, 2018," *Morbidity and Mortality Weekly Report*, vol. 69, no. 19 (2020); and Weiss, A.J., Head M.A., and Reid L.D., *Mental Health Disorders Among Delivery Inpatient Stays by Patient Race and Ethnicity, 2020*, HCUP Statistical Brief #302 (Rockville, Md.: Agency for Healthcare Research and Quality, December 2022). Severe maternal morbidity is an unexpected, adverse outcome of labor and delivery that results in significant short- or long-term health consequences, such as kidney failure or hysterectomy.

have experienced maternal deaths at a rate approximately 2.5 times higher than non-Hispanic, White (White) women in recent years.[3]

Further, we and others have reported that maternal health outcomes and disparities worsened during the COVID-19 pandemic.[4] For example, the overall maternal mortality rate increased from 20.1 maternal deaths per 100,000 live births in 2019 to 32.9 in 2021. However, the maternal mortality rate increased more for Black and Hispanic women as compared with White women during those years.[5] We also reported that the COVID-19 pandemic likely exacerbated factors that contribute to disparities in maternal health outcomes, such as access to care.[6]

In response to these issues, in June 2022, the White House released a *Blueprint for Addressing the Maternal Health Crisis in the U.S.*[7] The blueprint outlines various actions the federal government is undertaking or plans to undertake to improve maternal health, including several efforts from the Department of Health and Human Services (HHS) and its component agencies. In addition, HHS agencies and offices support states and local program teams in carrying out key efforts to advance maternal health. For example, one HHS program supports program teams working within states to implement best practices to make the birthing process safer.

[3]See D.L. Hoyert, *Maternal Mortality Rates in the United States, 2021*, Health E-Stats (Hyattsville, Md.: National Center for Health Statistics, March 2023). Throughout this report, we use terms identifying all racial groups to refer to women who are not Hispanic or Latina (Hispanic), while Hispanic women may be of any race. We use the term Black to refer to Black or African American women.

[4]See GAO, *Maternal Health: Outcomes Worsened and Disparities Persisted During the Pandemic*, GAO-23-105871 (Washington, D.C.: Oct. 19, 2022); and D.L. Hoyert, "Maternal Mortality Rates in the United States, 2021; M. Thoma, and E. Declercq, "All-Cause Maternal Mortality in the U.S. Before vs During the COVID-19 Pandemic," *JAMA Network Open* (June 28, 2022); and K. R. Fingar et al., "Effects of the COVID-19 Early Pandemic on Delivery Outcomes among Women with and Without COVID-19 at Birth," *Birth*, vol. 50, no. 4 (Aug. 2, 2023).

[5]The maternal mortality rate among Black women increased from 44.0 maternal deaths per 100,000 live births in 2019 to 69.9 in 2021. The maternal mortality rate among Hispanic women increased from 12.6 in 2019 to 28.0 in 2021; and the maternal mortality rate among White women increased from 17.9 in 2019 to 26.6 in 2021.

[6]See GAO-23-105871.

[7]See The White House, *White House Blueprint for Addressing the Maternal Health Crisis* (Washington, D.C.: June 2022).

The CARES Act includes a provision for us to monitor and oversee federal efforts to address the COVID-19 pandemic, as well as the effect of the pandemic on the health, economy, and public and private institutions of the U.S.[8] In this report we

1. describe what available HHS data show about maternal health during the COVID-19 pandemic;
2. examine the extent to which HHS has used key practices to assess the performance of selected maternal health efforts; and
3. describe how program teams have implemented selected HHS maternal health programs and any related implementation challenges.

To describe what available HHS data show about maternal health during the COVID-19 pandemic, we reviewed data from three of the department's data sets:

- **CDC's National Center for Health Statistics' vital statistics data** contains information the agency collects from death and birth certificates. We analyzed the vital statistics mortality data to calculate numbers and rates (per 100,000 live births) of maternal deaths, late maternal deaths, and maternal deaths that had COVID-19 listed as a contributing cause of death.[9] In addition, we used the vital statistics birth data to calculate numbers and percentages of births with selected characteristics related to prenatal care utilization and delivery.
- **Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project** contains information from discharge records for inpatient hospitalizations. We reviewed data provided by the Agency for Healthcare Research and Quality on national weighted counts and estimated rates of deliveries with severe maternal morbidity, a COVID-19 diagnosis, or both (per 10,000 deliveries).

[8]Pub. L. No. 116-136, § 19010(b), 134 Stat. 281, 580 (2020). The American Rescue Plan Act of 2021 also includes a provision for us to conduct oversight of the COVID-19 response. Pub. L. No. 117-2, § 4002, 135 Stat. 4, 78. All of our reports related to the COVID-19 pandemic are available at https://www.gao.gov/coronavirus. We also received a request to review issues related to maternal health during the COVID-19 pandemic.

[9]According to the World Health Organization, late maternal death is the death of a woman from direct or indirect obstetric causes more than 42 days, but less than 1 year after pregnancy. See appendix I for the *International Classification of Disease, 10th Revision* codes identifying maternal deaths, late maternal deaths, and maternal deaths with COVID-19 listed as a contributing cause.

- **CDC's Pregnancy Risk Assessment Monitoring System survey data** are collected from a set of surveys of women who recently had a live birth that asks about their behaviors, attitudes, and experiences before, during, and shortly after pregnancy. We reviewed data provided by CDC on estimates of maternal depression or depressive symptoms, use of prenatal and postpartum care, and experiences during the COVID-19 pandemic, such as using telehealth.

See appendix I for more details on each of these data sets and our analysis.

For each of these data sets, we reviewed data from the earliest comparable year of available data through the most recent year of available data.[10] For CDC vital statistics and Agency for Healthcare Research and Quality data, we identified trends before and during the COVID-19 pandemic. However, the Pregnancy Risk Assessment Monitoring System data we reviewed include different states and jurisdictions each year; thus, estimates are not directly comparable across years for this data set.[11] We also reviewed data by race and ethnicity, and payer for the delivery or insurance, and compared data across groups to identify disparities.[12] (See app. I for more details.) To assess the reliability of these data, we reviewed relevant documentation (e.g., user guides, survey questionnaires, and published reports), interviewed and reviewed written responses from agency officials, and examined the data for any obvious errors and omissions. We determined that the data we used are sufficiently reliable for the purpose of our reporting objectives. Comparisons between years, racial and ethnic

[10]In general, we analyzed data from 2016 or 2018 through 2021 or 2022, depending on the source. See appendix I for more details.

[11]Only data from participating states and jurisdictions that met a 50 percent response threshold are included in the aggregate data we reviewed for 2018 to 2021. Any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year.

[12]In some cases, we combined multiple racial groups, including people who report more than one race or "other" as "all other races," because the number of cases is too small to report separately due to privacy or reliability concerns. We did not analyze maternal deaths by insurance type, because insurance information cannot be obtained solely using the CDC vital statistics death data. We also analyzed data by age groups. (See app. II for additional data on maternal health outcomes.)

groups, and payer or insurance are statistically significant at the 95 percent confidence level unless otherwise noted.[13]

To examine the extent to which HHS incorporated key practices to assess the performance of its maternal health efforts, we selected three HHS efforts to review. We first selected the *White House Blueprint for Addressing the Maternal Health Crisis,* which HHS officials identified as the agency's primary maternal health strategy document. Next, we selected two HHS programs that are identified as key programs for addressing maternal health in the blueprint and by HHS officials. We selected these programs by identifying those that focus on maternal mortality and severe maternal morbidity broadly, and are implemented by teams in more than 45 states.

- ***Maternal Health Blueprint*** is a multi-year and whole-of-government strategy to combat maternal mortality and morbidity, and reduce racial disparities nationwide. The Office on Women's Health and the Office of the Assistant Secretary for Planning and Evaluation are coordinating an HHS-wide workgroup on maternal health and are the HHS offices responsible for assessing the implementation of the department's efforts in the blueprint.
- **Alliance for Innovation on Maternal Health (AIM)** is a quality improvement program that supports best practices to make birth safer and is administered by the Health Resources and Services Administration (HRSA).
- **Perinatal Quality Collaborative (PQC)** is a program that works to improve the quality of care for mothers and babies through quality improvement initiatives and is administered by CDC.

For each of these efforts, we reviewed relevant agency documents, such as program requirements for AIM and PQC's current performance periods.[14] We also interviewed appropriate office and agency officials to learn more about their current or planned practices for assessing the performance of their efforts, as well as officials from the national-level

[13]Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between estimated values being due to chance alone. See appendix I for more information.

[14]HRSA and CDC provide funding to state and local program teams to implement the AIM and PQC programs, respectively, within states. For purposes of this analysis, we assessed the AIM performance period from September 2023 to August 2027 under the funding opportunity HRSA-23-066, and the PQC performance period from September 2022 to September 2027 under CDC-RFA- DP22-2207.

organizations that provide technical assistance to state and local teams that implement the AIM and PQC programs.[15] Finally, we compared each office and agency's practices or planned practices for assessing the performance of their efforts and programs against GAO's key practices for federal performance management.[16] The key performance management practices include establishing goals that communicate the results that an agency seeks to achieve, establishing performance measures and measuring progress toward goals, and using performance information to assess results.

To describe how selected maternal health programs have been implemented, we interviewed officials from AIM and PQC program teams based in five different states: Illinois, Mississippi, New Jersey, Virginia, and Washington.[17] We selected these teams based on the respective states in which they are located to obtain variation in geographic region, the percent of the population from racial and ethnic groups other than non-Hispanic White, maternal mortality rate, and rurality. We interviewed officials from the program teams about how they implement quality improvement efforts, their work related to disparities and COVID-19, specific initiatives, and challenges they have faced. We also reviewed the program teams' documentation, such as workplans and performance reports submitted to HRSA and CDC.

We conducted this performance audit from September 2022 to February 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to

[15]The AIM Technical Assistance Center is operated by the American College of Obstetricians and Gynecologists, and the National Network of Perinatal Quality Collaboratives is operated by the National Institute for Children's Health Quality.

[16]This criteria is discussed in the following GAO reports: GAO, *Coast Guard: Additional Actions Needed to Improve Commercial Fishing Vessel Safety Efforts,* GAO-23-105289 (Washington, D.C.: Nov. 2, 2022); *Drug Manufacturing: FDA Should Fully Assess Its Efforts to Encourage Innovation*, GAO-23-105650 (Washington, D.C.: Mar. 10, 2023); and *Evidence-Based Policymaking: Practices to Help Manage and Assess the Results of Federal Efforts*, GAO-23-105460 (Washington, D.C.: July 12, 2023). Although GAO-23-105460 describes additional practices that agencies can take to manage and assess their efforts, this report was not published at the time we began our analysis. Therefore, we focused this analysis on the three-step process for agencies' performance management described in GAO-23-105289 and GAO-23-105650.

[17]We use the term "program team" to refer to the teams that implement the PQC and AIM program activities at the state level. Program teams may lead the PQC program, the AIM program, or both programs in their states. Program teams can vary by state, but may include officials from health departments, academic institutions, hospital associations, or other entities.

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

White House Blueprint for Addressing the Maternal Health Crisis

In response to high maternal mortality and morbidity rates in the U.S., and racial disparities in maternal health outcomes, the White House released the *Maternal Health Blueprint* in June 2022. The blueprint was developed in collaboration with more than a dozen federal departments and agencies—including HHS—and lays out specific actions agencies are undertaking or will undertake to address areas such as access to maternal health services and collection of maternal health data.[18] The blueprint states that the actions it identified are intended to decrease rates of maternal mortality and morbidity; reduce the disparities in maternal health outcomes; and improve the overall experience of pregnancy, birth, and the postpartum period for women across the U.S. To ensure responsible entities are making progress with the efforts, HHS's Office on Women's Health and Office of the Assistant Secretary for Planning and Evaluation are responsible for assessing the implementation of HHS's efforts identified in the *Maternal Health Blueprint.*

The blueprint identifies key HHS programs that address maternal health, according to HHS officials, including the AIM and PQC programs, which are overseen by HRSA and CDC, respectively.

AIM program. HRSA administers the AIM program, which supports efforts undertaken by program teams that generally operate within a state to increase access to safe, reliable, quality care, and assist with addressing maternal mortality and severe maternal morbidity. Program teams engage provider organizations, state-based public health systems, consumer groups, and other stakeholders in a national partnership to

[18]Within HHS, multiple agencies and offices work in support of maternal health efforts and data collection, including the Agency for Healthcare Quality and Research, CDC, Centers for Medicare & Medicaid Services, HRSA, the Office of the Assistant Secretary for Planning and Evaluation, and the Office on Women's Health.

develop and help to implement patient safety bundles in birthing facilities across the U.S.[19] Patient safety bundles are sets of evidence-based and best practices intended to address leading known causes of preventable maternal mortality and severe maternal morbidity in the U.S., such as obstetric hemorrhage, severe hypertension in pregnancy, and perinatal mental health conditions. For example, one of the practices in the perinatal mental health bundle is to screen every patient for mental health conditions consistently throughout the perinatal period.

According to HRSA, implementation of patient safety bundles may improve patient outcomes and assist with addressing maternal mortality and severe maternal morbidity. The program teams collect and analyze data that they use to drive continuous improvements in birthing facility practices.

HRSA launched the program in 2014, and as of August 2023, the program was being implemented in 49 states and Washington, D.C. According to HRSA officials, as of August 2023, approximately 74 percent of birthing facilities within the enrolled states and Washington, D.C., were participating in the program. HRSA also funds the AIM Technical Assistance Center to provide technical assistance and capacity building to program teams to support birthing facility engagement, patient safety bundle implementation and sustainability, and data analysis and reporting, according to HRSA officials. For example, the AIM Technical Assistance Center created learning communities on topics such as data support and quality improvement.

PQC program. CDC provides funding and technical support to the PQC program, which supports primarily state-based, multidisciplinary program teams that work to improve measurable outcomes for maternal and infant health. Program teams provide an infrastructure to advance evidence-based clinical practices—such as the AIM patient safety bundles—using quality improvement principles. Program teams are expected to work with clinicians, experts, and stakeholders, including patients and families, to disseminate best practices and optimize resources with the goal of reducing disparities in outcomes and enhancing equitable care. According to CDC documentation, PQCs may also implement initiatives to improve connections between clinical and community settings to address nonmedical factors that influence health outcomes. After identifying an

[19]Our use of the term “facility” throughout the document includes hospitals, birthing facilities, and clinics, as well as any other providers or facilities with which program team officials described engaging for PQC and AIM initiatives.

area for change, program teams provide opportunities for collaborative learning, rapid response data, and quality improvement support to facility staff implementing the initiative.

CDC has supported PQC program teams since 2011. As of September 2023, it funds 36 program teams and provides technical support to a total of 50 program teams.[20] In addition, CDC provides technical support, mentoring, and resources through the National Network of Perinatal Quality Collaboratives to help program teams nationwide make improvements. The national network does this by providing a forum for program teams to share experiences and knowledge that includes webinars, an online community network, and in-person meetings.

The AIM and PQC programs are often implemented by program teams working toward similar goals at the state level, according to CDC and HRSA officials. Program teams support birthing facilities' implementation of PQC and AIM initiatives, for example, by collecting data on the initiatives and providing learning opportunities for facilities. They can vary by state, but may include officials from health departments, academic institutions, hospital associations, or other entities. According to documentation from CDC and HRSA, 21 of the 36 state-based program teams that receive CDC PQC funding also receive HRSA AIM funding. Further, most AIM programs are led by PQC program teams, according to HRSA officials. In addition, the two federal agencies that lead AIM and PQC and the two national-level entities that provide technical assistance to program teams regularly collaborate, according to HRSA officials.

Maternal Mortality and Morbidity Worsened and Use of Prenatal Care Decreased During the COVID-19 Pandemic

Maternal mortality and morbidity worsened early in the COVID-19 pandemic and many women reported feeling more depressed and anxious than usual, according to data from CDC and the Agency for Healthcare Research and Quality. Additionally, although most women

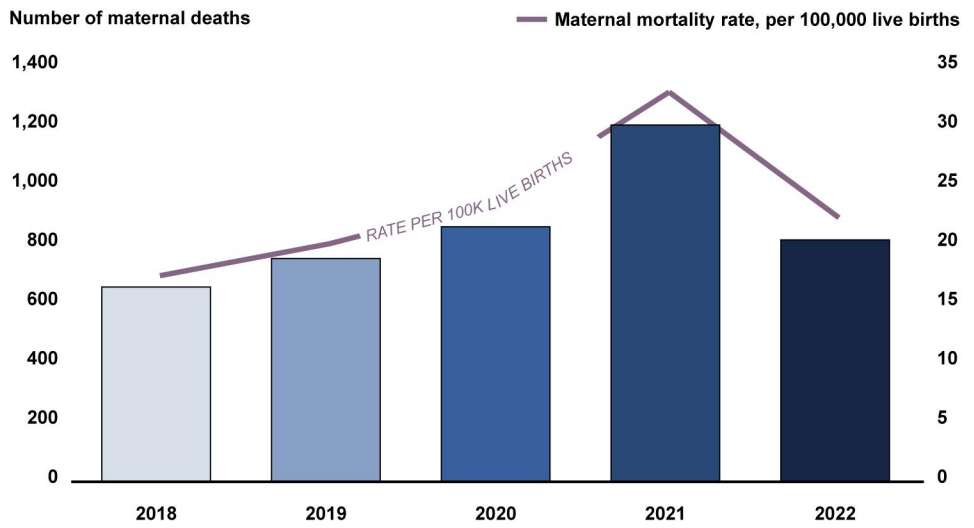
[20]One PQC program team works across both North Dakota and South Dakota, and there are two PQC program teams operating within California. According to CDC officials and documentation, the agency provides direct funding to 36 PQC program teams, but provides technical support to all program teams, including those funded through other sources.

attended prenatal and postpartum visits, attendance at prenatal visits declined in 2020 before returning to pre-pandemic levels in 2021. For all these trends, disparities persisted during the pandemic between some demographic groups, including disparities between Black and White women.

Maternal Mortality and Morbidity Rates Worsened During the Pandemic; Disparities Persisted for Black and American Indian or Alaska Native Women

Maternal mortality. The number and rate of maternal deaths increased significantly during the first 2 years of the COVID-19 pandemic—peaking in 2021 before decreasing in 2022—according to our analysis of CDC's vital statistics data.[21] (See fig. 1.) Specifically, the number of maternal deaths increased from 658 in 2018 to a peak of 1,205 in 2021; the maternal mortality rate increased from 17.4 maternal deaths per 100,000 live births in 2018 to a peak of 32.9 in 2021.

Figure 1: Number and Rate of Maternal Deaths, 2018—2022



Source: GAO analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics data. | GAO-24-106271

Accessible Data for Figure 1: Number and Rate of Maternal Deaths, 2018—2022

[21]The 2022 data were accessed on July 12, 2023; these data are provisional and subject to change.

	2018	2019	2020	2021	2022
Maternal Deaths	658	754	861	1205	817
Maternal Mortality Rate (per 100,000 live births)	17.4	20.1	23.8	32.9	22.3

Source: GAO analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics data. I GAO-24-106271

Notes: According to the World Health Organization, a maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Maternal deaths are assigned to code numbers A34, O00–O95, and O98–O99 of *the International Classification of Disease, 10th Revision.* The 2022 data were accessed on July 12, 2023; these data are provisional and subject to change. The margins of error at the 95 percent confidence level for the maternal deaths and maternal mortality rates were no larger than 68 deaths and 1.9 deaths per 100,000 live births, respectively.

In addition, late maternal deaths—those that occur between 43 days and 1 year after pregnancy—followed a similar trend as maternal deaths, though some annual differences were not statistically significant, according to our analysis of CDC vital statistics data.[22] The rate of late maternal deaths per 100,000 live births increased from 7.3 in 2018 to a peak of 12.6 in 2021, and decreased to 11.4 in 2022.[23]

The number of COVID-19 related maternal deaths—those for which COVID-19 is listed on the death certificate as a cause that contributed to death—was similar to the increase in maternal deaths during the pandemic. About 12 percent of maternal deaths in 2020 and 2022 were related to COVID-19, while 36 percent of maternal deaths were related to COVID-19 in 2021, according to our analysis of CDC vital statistics data. According to CDC, pregnant women may be at higher risk for adverse outcomes from COVID-19, such as pregnancy complications, severe illness, and death, likely due to physiological changes that occur during pregnancy, such as decreased lung capacity and a weakened immune system.[24]

Disparities persisted for American Indian or Alaska Native and Black women who experienced higher maternal mortality rates before and during the pandemic, as compared with Asian, White, and Hispanic

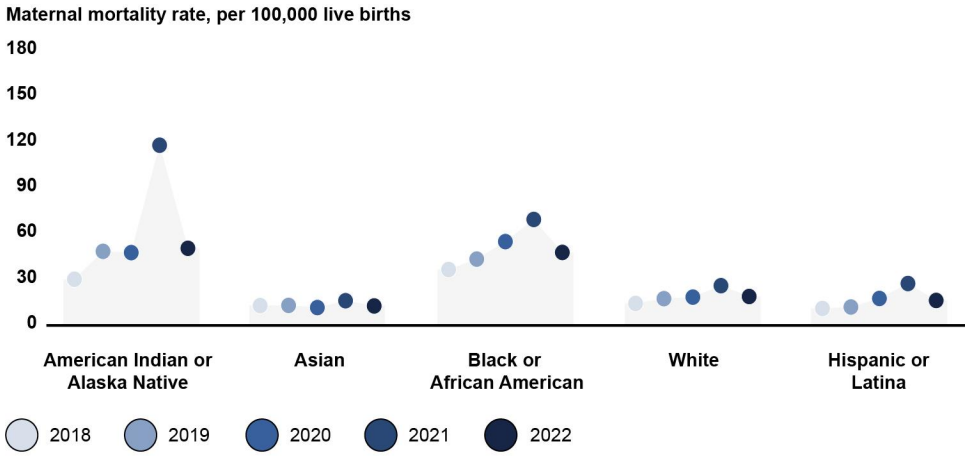
[22]Late maternal deaths are not included in official CDC maternal mortality rates, which include only deaths that occur during or up to 42 days after pregnancy. Differences that are not statistically significant could be due to chance or random variation.

[23]The decrease between 2021 and 2022 was not statistically significant.

[24]See L.D. Zambrano et al., "Update: Characteristics of Symptomatic Women of Reproductive Age with Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status—United States, January 22–October 3, 2020," *Morbidity and Mortality Weekly Report*, vol. 69 (2020).

women, according to our analysis of CDC vital statistics data.[25] (See fig. 2.) For example, in 2019, the maternal mortality rate was 49.2 maternal deaths per 100,000 live births among American Indian or Alaska Native women and 44.0 among Black women; at the peak in 2021, the maternal mortality rate was 118.7 and 69.9, respectively, among these women.[26]

Figure 2: Maternal Mortality Rate (Deaths per 100,000 Live Births), by Race and Ethnicity, 2018—2022



Source: GAO analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics data. | GAO-24-106271

Accessible Data for Figure 2: Maternal Mortality Rate (Deaths per 100,000 Live Births), by Race and Ethnicity, 2018—2022

Race/Ethnicity	2018	2019	2020	2021	2022
American Indian or Alaska Native	30.9	49.2	48.5	118.7	51.2
Asian	13.3	13.8	12.3	16.8	13.3
Black	37.3	44.0	55.3	69.9	48.4
White	14.9	17.9	19.1	26.6	19.4
Hispanic	11.8	12.6	18.2	28.0	16.9

Source: GAO analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics data. I GAO-24-106271

Notes: According to the World Health Organization, a maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Maternal deaths are assigned to code numbers A34, O00–O95,

[25]We also report these data by age in appendix II.

[26]The maternal mortality rate for American Indian or Alaska Native women in 2018 is based on fewer than 20 deaths and should be interpreted with caution.

and O98–O99 of the *International Classification of Disease, 10th Revision.* The 2022 data were accessed on July 12, 2023; these data are provisional and subject to change. American Indian or Alaska Native, Asian, Black or African American, and White are not Hispanic or Latina; Hispanic women may be of any race. Annual numbers for non-Hispanic, Native Hawaiian or Other Pacific Islander and multiracial women were suppressed or not available in published reports in some years because the number of deaths is small. The average maternal mortality rate for the non-Hispanic Native Hawaiian or Other Pacific Islander population was 47.4 deaths per 100,000 live births between 2018 and 2022, and the rate for the non-Hispanic population with more than one race was 13.6 deaths per 100,000 live births between 2018 and 2021. The margins of error at the 95 percent confidence level for the maternal mortality rates for the non-Hispanic American Indian or Alaska Native population were no larger than 49.8 deaths per 100,000 live births; the margins of error for all other racial and ethnic groups were no larger than 7.2 deaths per 100,000 live births. The maternal mortality rate for American Indian or Alaska Native women in 2018 is based on fewer than 20 deaths and should be interpreted with caution.

Regarding late maternal deaths, Black women experienced maternal death at a rate more than twice as high as White and Hispanic women from 2018 to 2022: 21.7 late maternal deaths per 100,000 live births as compared with 8.6 and 7.8, respectively.[27] Black and Hispanic women also had higher rates of COVID-19-related maternal deaths in 2020 through 2022, as compared with White women, according to our analysis of CDC vital statistics data.[28] Specifically, the average COVID-19-related maternal mortality rate during these years was 10.5 per 100,000 live births among Black women, 6.9 among Hispanic women, and 3.9 among White women.

Severe maternal morbidity. Severe maternal morbidity—unexpected adverse outcomes of labor and delivery that results in significant short- or long-term health consequences—was generally increasing in the years prior to the pandemic and increased significantly in 2020, the first year of

[27]The difference in the COVID-19-related maternal mortality rate was not significant between Hispanic and White women in 2022. Data on late maternal deaths for other racial groups were not available for all of the data years due to the small number of deaths and could not be reported separately.

[28]Between 2020 and 2022, the average COVID-19-related maternal mortality rate for American Indian or Alaska Native and Asian women was 23.0 and 2.6 per 100,000 live births, respectively.

the COVID-19 pandemic, according to the Agency for Healthcare Research and Quality data.[29] (See table 1.)

Table 1: Estimated Deliveries with Severe Maternal Morbidity, 2016—2020

Estimates of severe maternal morbidity	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)
Estimated number of deliveries with severe maternal morbidity	27,260 (25,828, 28,692)	26,495 (25,118, 27,872)	27,860 (26,378, 29,342)	28,570 (26,981, 30,159)	30,445 (28,780, 32,110)
Estimated rate of severe maternal morbidity per 10,000 deliveries	72.0 (69.2, 74.9)	71.5 (68.7, 74.4)	76.7 (73.6, 79.7)	79.7 (76.4, 83.0)	88.2 (84.4, 91.9)

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample 2016-2020. | GAO-24-106271

Notes: Severe maternal morbidity is an unexpected adverse outcome of labor and delivery that results in significant short- or long-term health consequences. These data reflect national estimates based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years where a procedure or diagnosis code indicating severe maternal morbidity appears on the discharge record. These data exclude cases where blood transfusions are the sole indicator of severe maternal morbidity, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. The 95 percent confidence intervals provide information on the relative precision of a national estimate. Non-overlap between confidence intervals suggests a statistically significant difference between estimates.

In addition, as of November 2022, the Agency for Healthcare Research and Quality provided 2021 Healthcare Cost and Utilization Project data from 26 states and Washington, D.C., through an online tool; of these, 24 states and Washington, D.C., reported a higher rate of severe maternal morbidity in 2021 as compared with 2020.[30]

Further, disparities persisted for Black women, who experienced the highest rates of severe maternal morbidity before and during the pandemic, when compared with other racial and ethnic groups, according

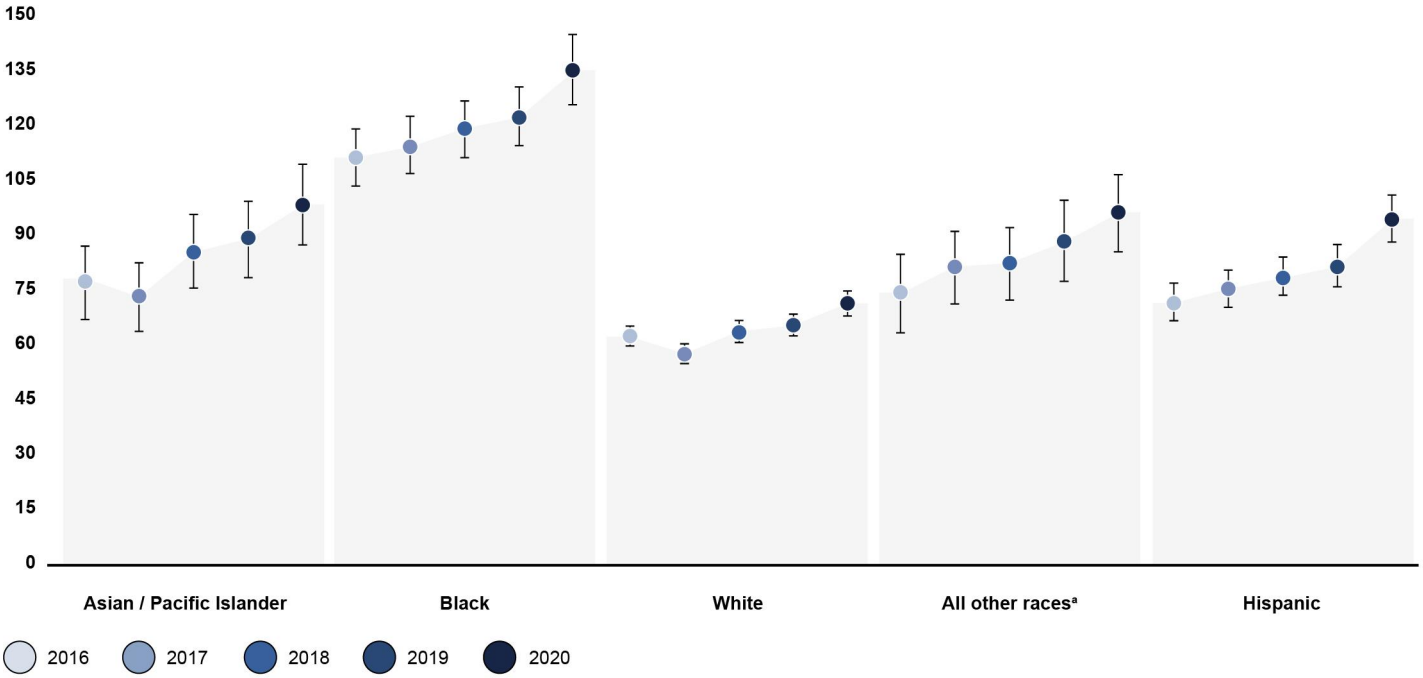
[29]In this report, severe maternal morbidity refers only to cases that occur during in-hospital deliveries for females aged 12 to 55 years and excludes cases where blood transfusions are the sole indicator, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. According to one study, one in seven cases of severe maternal morbidity among women with private insurance and about one in six cases of severe maternal morbidity among women with Medicaid occur after delivery discharge. See J. Chen et al., "Assessment of Incidence and Factors Associated With Severe Maternal Morbidity After Delivery Discharge Among Women in the U.S.," *JAMA Network Open* (2021).

See appendix I for more detail on severe maternal morbidity, and appendix II for additional analysis by race and ethnicity, primary expected payer for the delivery, and age.

[30]See Agency for Healthcare Research and Quality, *Healthcare Cost and Utilization Project*, "Fast Stats," accessed January 9, 2023, https://datatools.ahrq.gov/hcup-fast-stats#downloads.

to these data. (See fig. 3.) Specifically, the estimated rate of severe maternal morbidity for Black women was about twice as high as the estimated rate for White women each year from 2016 to 2020.

Figure 3: Estimated Rate of In-Hospital Deliveries with Severe Maternal Morbidity by Race and Ethnicity, 2016—2020



Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample, 2016-2020. | GAO-24-106271

Accessible Data for Figure 3: Estimated Rate of In-Hospital Deliveries with Severe Maternal Morbidity by Race and Ethnicity, 2016—2020

	2016			2017			2018			2019			2020		
Race/Ethnicity	**lower**	**Estimate**	**upper**	**lower**	**Estimate**	**upper**	**lower**	**Estimate**	**upper**	**lower**	**Estimate**	**upper**	**lower**	**Estimate**	**upper**
Asian / Pacific Islander	66	77	87	63	73	82	75	85	96	78	89	99	87	98	109
Black	103	111	119	106	114	123	111	119	127	114	122	131	125	135	145
White	59	62	65	54	57	60	60	63	66	62	65	68	67	71	75
All other races	63	74	85	71	81	91	72	82	92	77	88	99	85	96	106
Hispanic	66	71	77	70	75	80	73	78	84	75	81	87	88	94	101

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample, 2016-2020. I GAO-24-106271

Notes: Severe maternal morbidity is an unexpected adverse outcome of labor and delivery that results in significant short- or long-term health consequences. These data reflect national estimates based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years where a procedure or diagnosis code indicating severe maternal morbidity appears on the discharge record. These data exclude cases where blood transfusions are the sole indicator of severe maternal morbidity, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. Vertical bars represent 95 percent confidence levels, which provide information on the relative precision of a national estimate.

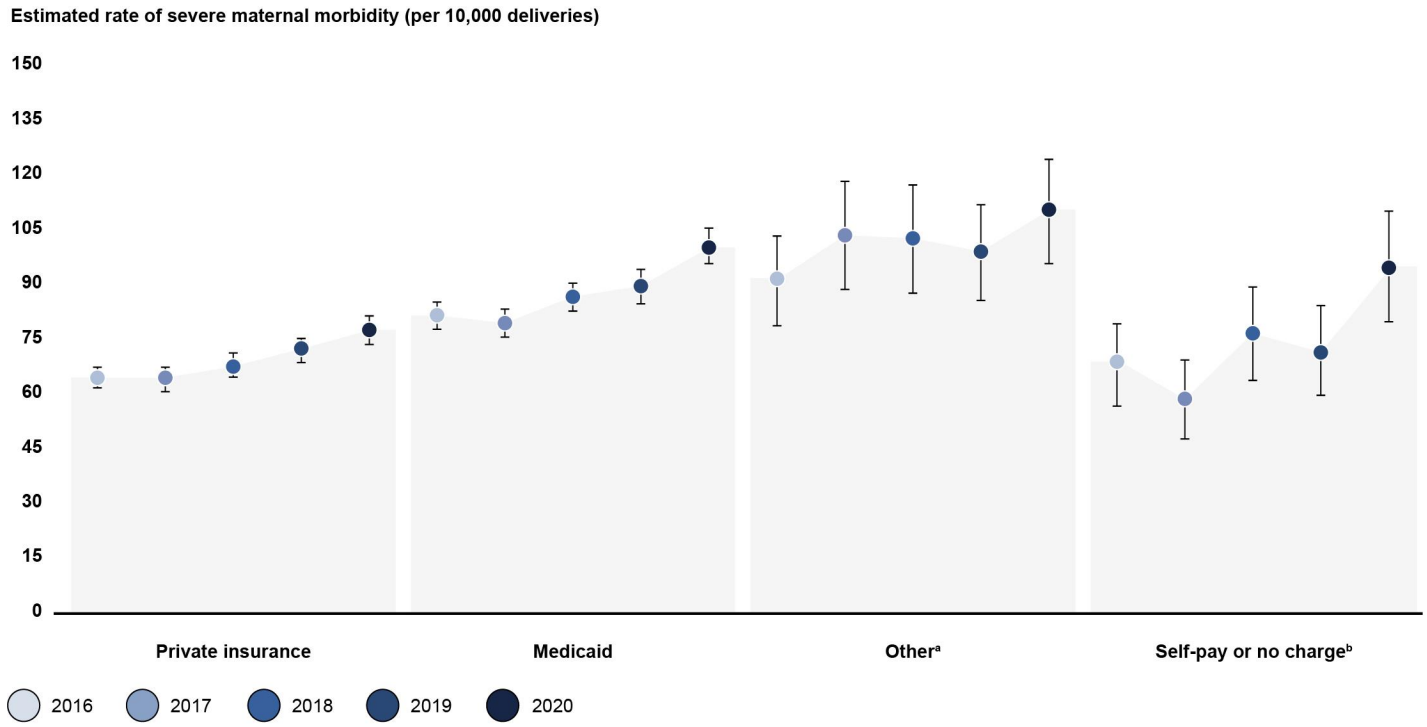
Non-overlap between confidence intervals suggests a statistically significant difference between estimates. Asian/Pacific Islander, Black or African American (Black), White, and all other race groups are not Hispanic or Latina (Hispanic); Hispanic women may be of any race.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race.

In addition, women with Medicaid or other government programs as the expected payer for their delivery experienced the highest rates of severe maternal morbidity each year from 2016 to 2020, as compared with those with private insurance, according to Agency for Healthcare Research and Quality data.[31] Specifically, from 2016 to 2020, the estimated rate of severe maternal morbidity was about 1.2 to 1.6 times higher for women with Medicaid or other government insurance as compared with those with private insurance as their expected payer, and increased significantly for those with Medicaid in 2020. (See fig. 4.)

[31]Expected payer is the primary payer the hospital expects to pay the hospital bill, according to Agency for Healthcare Research and Quality documentation; however, agency officials noted that the actual payer for the bill could be different. Other government payers include other federal and state health programs, such as those from the Indian Health Service and military health care coverage.

Figure 4: Estimated Rate of In-Hospital Deliveries with Severe Maternal Morbidity by Expected Payer, 2016—2020



Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample, 2016-2020. | GAO-24-106271

Accessible Data for Figure 4: Estimated Rate of In-Hospital Deliveries with Severe Maternal Morbidity by Expected Payer, 2016—2020

	2016			2017			2018			2019			2020		
Expected Payer	lower	Estimate	upper	lower	Estimate	upper	lower	Estimate	upper	lower	Estimate	upper	lower	Estimate	upper
Private	61	64	67	60	64	67	64	67	71	68	72	75	73	77	81
Medicaid	77	81	85	75	79	83	82	86	90	84	89	94	95	100	105
None	56	68	79	47	58	69	63	76	89	59	71	84	79	94	110
Other	78	91	103	88	103	118	87	102	117	85	99	112	95	110	124

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample, 2016-2020. I GAO-24-106271

Notes: Severe maternal morbidity is an unexpected outcome of labor and delivery that results in significant short- or long-term health consequences. These data reflect national estimates based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years where a procedure or diagnosis code indicating severe maternal morbidity appears on the discharge record. These data exclude cases where blood transfusions are the sole indicator of severe maternal morbidity, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. Vertical bars represent 95 percent confidence levels, which provide information on the relative precision of a national estimate. Non-overlap between confidence intervals suggests a statistically significant difference between estimates. Expected payer is the primary payer the hospital expects to pay the hospital bill, according to Agency for Healthcare Research and Quality documentation.

[a]Other payers in this data source include other government payers, such as the Indian Health Service and military health care coverage.

[b]The self-pay or no charge category in this data source includes those who self-pay, have no charge or expected payment, or receive charity care, and may include other payers such as government programs for the indigent.

Severe maternal morbidity was more common when a COVID-19 diagnosis was present, and certain groups were more likely to have COVID-19 diagnosis at delivery. Specifically, the estimated rate of deliveries with severe maternal morbidity in 2020 was about five times higher when a COVID-19 diagnosis was present (442 per 10,000 deliveries) than without (83 per 10,000 deliveries), according to Agency for Healthcare Research and Quality data. [32] Hispanic women were about three times as likely to be diagnosed with COVID-19 at delivery as compared with White and Asian or Pacific Islander women.[33] Women with Medicaid as the expected payer for their delivery were about twice as likely to be diagnosed with COVID-19 at delivery as compared with women with private insurance.

About 17 Percent of Women Reported Depression During Pregnancy in 2021; More Women Reported Feeling Anxious Due to the COVID-19 Pandemic

According to data from CDC's Pregnancy Risk Assessment Monitoring System survey of women who recently gave birth, the percentage of respondents who reported having depression during pregnancy ranged from about 14 percent in 2018 to about 17 percent in 2021.[34] In addition, around 7 to 8 percent reported always or often feeling down, hopeless, or depressed after pregnancy, while around 9 to 10 percent reported always

[32]The 95 percent confidence interval for deliveries with severe maternal morbidity and a COVID-19 diagnosis is between 397.0 and 487.2. The 95 percent confidence interval for deliveries with severe maternal morbidity and without a COVID-19 diagnosis is between 79.8 and 86.9.

[33]Women from all other racial groups were twice as likely to be diagnosed with COVID-19 at delivery as compared with White and Asian or Pacific Islander women. See appendix II for more information, including data by age.

[34]See appendix II for annual percentages and 95 percent confidence intervals. The states and jurisdictions included in the data we reviewed vary from year to year, because only data from those that met a 50 percent response threshold are included in the aggregate data. Any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. See appendix I for more information.

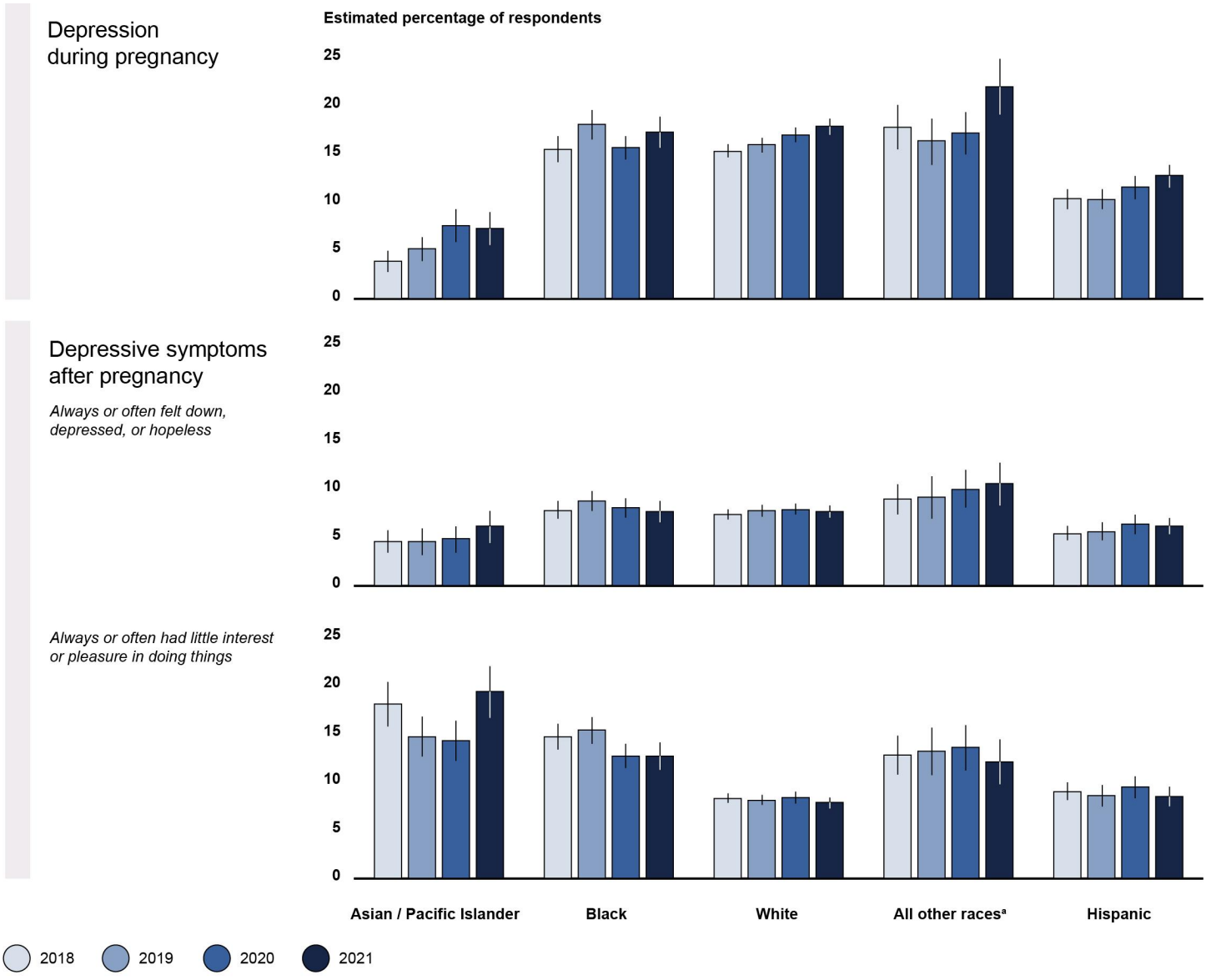
or often having little interest or pleasure in doing things after pregnancy during those years.[35]

During those years, fewer Asian or Pacific Islander and Hispanic respondents reported having depression during pregnancy, as compared with other racial and ethnic groups, according to these data. Similarly, in 2018 and 2019, fewer Asian or Pacific Islander and Hispanic women reported always or often feeling down, hopeless, or depressed after pregnancy. However, the estimated percentage was lower for only Asian or Pacific Islander women in 2020 and was similar across all races and ethnicities in 2021. A smaller percentage of White and Hispanic women reported always or often having little interest or pleasure in doing things after pregnancy each year from 2018 through 2021. Also, respondents with Medicaid were consistently more likely to report depression during pregnancy or depressive symptoms after pregnancy than those with private insurance from 2018 to 2021.[36] (See figs. 5 and 6.)

[35]See appendix II for annual estimated percentages and 95 percent confidence intervals.

[36]Insurance is the type of insurance the respondent reported having during pregnancy for prenatal care or after pregnancy. Respondents who reported not having any prenatal care are excluded from data on depression during pregnancy, according to CDC officials. We also report these data by age in appendix II.

Figure 5: Estimated Percentage of Respondents Who Reported Depression during Pregnancy and Depressive Symptoms after Pregnancy by Race and Ethnicity, 2018—2021



Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Accessible Data for Figure 5: Estimated Percentage of Respondents Who Reported Depression during Pregnancy and Depressive Symptoms after Pregnancy by Race and Ethnicity, 2018—2021

na	na	low er	201 8	upp er	low er	201 9	upp er	low er	202 0	upp er	low er	202 1	uppe r
Depression During Pregnancy	Asian / Pacific Islander	2.8	3.9	5.0	3.9	5.2	6.4	5.9	7.6	9.3	5.6	7.3	9.0
Depression During Pregnancy	Black	14.1	15.5	16.9	16.5	18.1	19.6	14.4	15.7	17.0	15.6	17.3	18.9
Depression During Pregnancy	White	14.6	15.3	16.0	15.2	16.0	16.7	16.2	17.0	17.8	17.0	17.9	18.7
Depression During Pregnancy	All other races	15.5	17.8	20.1	13.9	16.4	18.8	15.0	17.2	19.4	19.1	22.0	24.9
Depression During Pregnancy	Hispanic	9.3	10.4	11.4	9.2	10.3	11.5	10.4	11.6	12.8	11.5	12.8	14.0
Depressive Symptoms After Pregnancy Always or often felt down, depressed, or hopeless	Asian / Pacific Islander	3.4	4.6	5.8	3.2	4.6	6.0	3.5	4.9	6.2	4.5	6.2	7.8
Depressive Symptoms After Pregnancy Always or often felt down, depressed, or hopeless	Black	6.9	7.8	8.8	7.7	8.8	9.9	7.1	8.1	9.1	6.6	7.7	8.8
Depressive Symptoms After Pregnancy Always or often felt down, depressed, or hopeless	White	6.9	7.4	7.9	7.2	7.8	8.4	7.4	7.9	8.5	7.1	7.7	8.3
Depressive Symptoms After Pregnancy Always or often felt down, depressed, or hopeless	All other races	7.4	9.0	10.6	7.0	9.2	11.4	8.1	10.0	12.0	8.4	10.6	12.8

na	na	low er	201 8	upp er	low er	201 9	upp er	low er	202 0	upp er	low er	202 1	uppe r
Depressive Symptoms After Pregnancy Always or often felt down, depressed, or hopeless	Hispanic	4.7	5.4	6.2	4.7	5.6	6.6	5.4	6.4	7.4	5.4	6.2	7.0
Depressive Symptoms After Pregnancy Always or often had little interest or pleasure in doing things	Asian Pacific Islander	15.8	18.1	20.4	12.7	14.7	16.8	12.2	14.3	16.4	16.7	19.4	22.0
Depressive Symptoms After Pregnancy Always or often had little interest or pleasure in doing things	Black	13.4	14.7	16.1	14.0	15.4	16.7	11.5	12.7	13.9	11.3	12.7	14.1
Depressive Symptoms After Pregnancy Always or often had little interest or pleasure in doing things	White	7.8	8.3	8.8	7.6	8.1	8.7	7.8	8.4	9.0	7.3	7.9	8.4
Depressive Symptoms After Pregnancy Always or often had little interest or pleasure in doing things	All other races	10.8	12.8	14.8	10.7	13.2	15.6	11.2	13.6	15.9	9.8	12.1	14.4
Depressive Symptoms After Pregnancy Always or often had little interest or pleasure in doing things	Hispanic	8.1	9.0	10.0	7.5	8.6	9.7	8.4	9.5	10.6	7.5	8.5	9.5

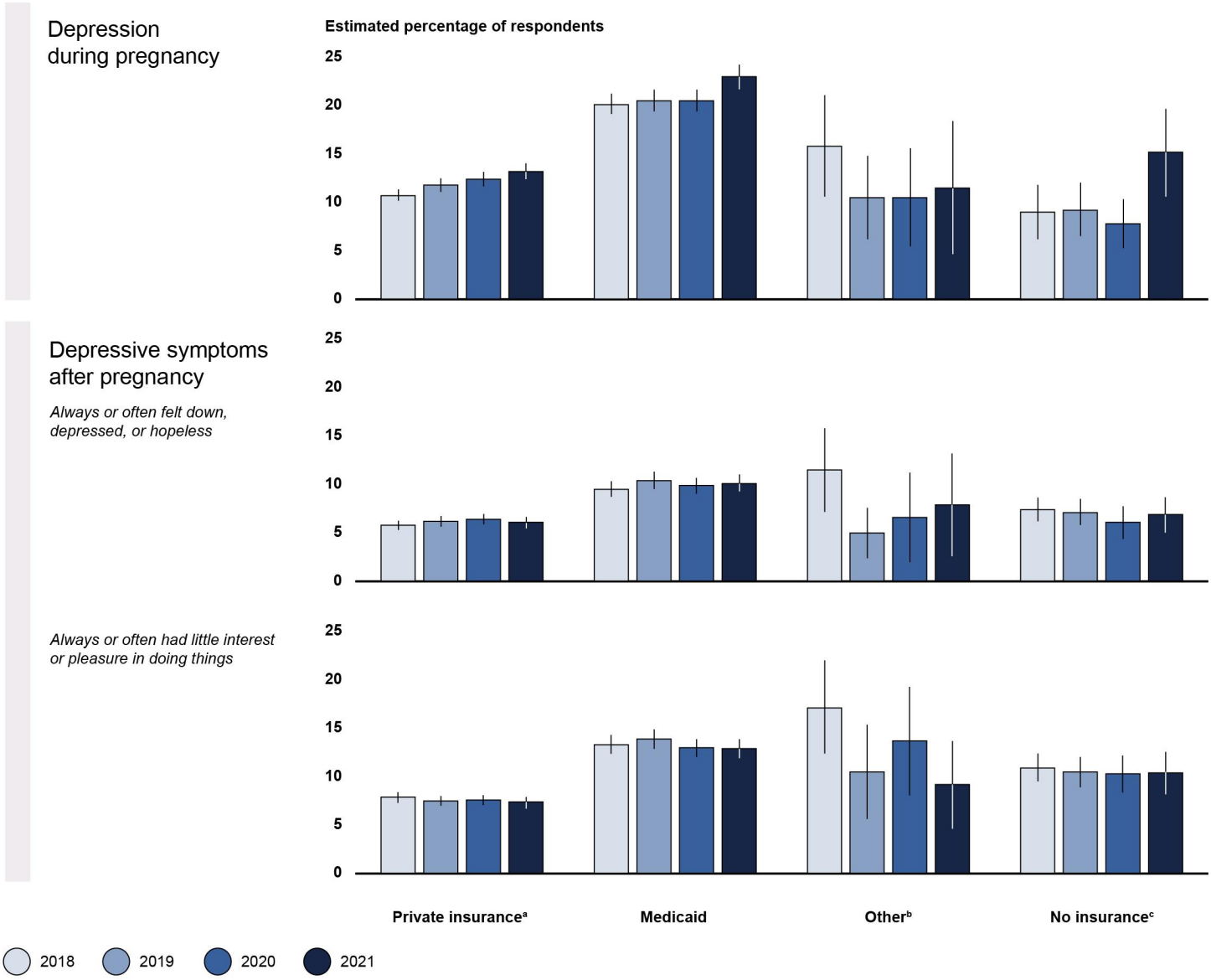
Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. I GA0-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that participate in the Pregnancy Risk Assessment Monitoring System survey and had at least a 50 percent response rate. As a result, the states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. Vertical bars represent 95 percent confidence levels, which provide information on the relative precision of an estimate. Depression

symptoms after pregnancy reflects those who reported experiencing this symptom always or often. Asian/Pacific Islander, Black or African American (Black), White, and all other race groups are not Hispanic or Latina (Hispanic); Hispanic women may be of any race.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race, according to CDC officials.

Figure 6: Estimated Percentage of Respondents Who Reported Depression during Pregnancy and Depressive Symptoms after Pregnancy by Insurance, 2018—2021



Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Accessible Data for Figure 6: Estimated Percentage of Respondents Who Reported Depression during Pregnancy and Depressive Symptoms after Pregnancy by Insurance, 2018—2021

na	na	low er	201 8	upp er	low er	201 9	upp er	low er	202 0	upp er	low er	202 1	uppe r
Depression During Pregnancy	Private insurance	10.1	10.7	11.3	11.1	11.8	12.5	11.7	12.4	13.1	12.5	13.2	14.0
Depression During Pregnancy	Medicaid	19.1	20.1	21.2	19.4	20.5	21.6	19.5	20.5	21.6	21.7	23.0	24.2
Depression During Pregnancy	Other	10.6	15.8	21.1	6.2	10.5	14.8	5.5	10.5	15.6	4.7	11.5	18.4
Depression During Pregnancy	No insurance	6.2	9.0	11.8	6.5	9.2	12.0	5.3	7.8	10.3	10.6	15.2	19.7
Depressive Symptoms After Pregnancy Always or often felt down, depressed, or hopeless	Private insurance	5.3	5.8	6.2	5.7	6.2	6.7	5.9	6.4	6.9	5.6	6.1	6.6
Depressive Symptoms After Pregnancy Always or often felt down, depressed, or hopeless	Medicaid	8.7	9.5	10.3	9.5	10.4	11.3	9.1	9.9	10.7	9.3	10.1	11.0
Depressive Symptoms After Pregnancy Always or often felt down, depressed, or hopeless	Other	7.2	11.5	15.8	2.4	5.0	7.6	2.0	6.6	11.2	2.6	7.9	13.2
Depressive Symptoms After Pregnancy Always or often felt down, depressed, or hopeless	No insurance	6.1	7.4	8.6	5.8	7.1	8.5	4.4	6.1	7.7	5.1	6.9	8.7

na	na	low er	201 8	upp er	low er	201 9	upp er	low er	202 0	upp er	low er	202 1	uppe r
Depressive Symptoms After Pregnancy Always or often had little interest or pleasure in doing things	Private insurance	7.3	7.9	8.4	7.0	7.5	8.0	7.1	7.6	8.1	6.8	7.4	7.9
Depressive Symptoms After Pregnancy Always or often had little interest or pleasure in doing things	Medicaid	12.4	13.3	14.3	12.9	13.9	14.9	12.1	13.0	13.9	11.9	12.9	13.8
Depressive Symptoms After Pregnancy Always or often had little interest or pleasure in doing things	Other	12.3	17.1	22.0	5.6	10.5	15.4	8.1	13.7	19.3	4.7	9.2	13.7
Depressive Symptoms After Pregnancy Always or often had little interest or pleasure in doing things	No insurance	9.5	10.9	12.4	9.0	10.5	12.0	8.4	10.3	12.2	8.2	10.4	12.6

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. I GA0-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that participate in the Pregnancy Risk Assessment Monitoring System survey and had at least a 50 percent response rate. As a result, the states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. Vertical bars represent 95 percent confidence levels, which provide information on the relative precision of an estimate. Depression symptoms after pregnancy reflects those who reported experiencing this symptom always or often. Insurance is the type of insurance respondents reported having during pregnancy for prenatal care or after pregnancy. Respondents who reported not having prenatal care are excluded from data on depression during pregnancy, according to CDC officials.

[a]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[b]Other insurance in this data source includes other state-specific government plans or programs.

[c]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

When asked specifically about the COVID-19 pandemic, about 29 percent of respondents said they felt more depressed than usual due to the pandemic in 2020, according to data from CDC's survey of women who

recently had a live birth.[37] In addition, about half of respondents said they felt more anxious than usual due to the pandemic.[38] We previously reported that, according to selected research, stakeholders, and HHS officials, anxiety, depression, or stress may have worsened for pregnant and postpartum women due to the pandemic—in particular, due to social isolation and fears of COVID-19 infection.[39] In 2021, the percentage of respondents reporting feeling more depressed than usual due to the pandemic was about 26 percent, and the percentage feeling more anxious than usual due to the pandemic was about 46 percent.[40]

Prenatal Visits Decreased Slightly in 2020; Disparities Persisted

Prenatal care. Overall, most women initiated prenatal care in the first 4 months of pregnancy before and during the COVID-19 pandemic, according to our analysis of CDC vital statistics data; however, fewer women who gave birth in 2020 and initiated prenatal within the first 4 months of pregnancy attended the recommended number of prenatal visits as compared with earlier years.[41] (See table 2.)

[37]The 95 percent confidence interval for the percentage of respondents who reported feeling more depressed than usual due to the pandemic is between 27.8 and 30.2 percent in 2020.

The states and jurisdictions that utilized the COVID-19 questionnaire and that are included in the aggregate estimates varies from the core survey. See appendix I for more information.

[38]The 95 percent confidence interval for the percentage of respondents who reported feeling more anxious than usual due to the pandemic is between 49.8 and 52.5 percent in 2020.

[39]See GAO-23-105871.

[40]The 95 percent confidence interval for the percentage of respondents who reported feeling more depressed than usual due to the pandemic is between 24.6 and 26.8 percent in 2021. The 95 percent confidence interval for the percentage of respondents who reported feeling more anxious than usual due to the pandemic is between 44.8 and 47.3 percent in 2021.

[41]We examined the initiation of care in the first 4 months of pregnancy because this is part of the Adequacy of Prenatal Care Utilization Index, a measure used to assess prenatal care utilization in the U.S., including by CDC. According to this index, having at least adequate prenatal care is defined as initiating prenatal care in the first 4 months of pregnancy and attending at least 80 percent of the number of visits recommended by the American College of Obstetricians and Gynecologists, adjusted for gestational age. See appendix I for more information.

Table 2: Percentage of Births by Timing and Attendance of Prenatal Care Visits, 2016—2021

Timing and attendance of prenatal care visits	2016	2017	2018	2019	2020	2021
Initiated prenatal care in the first 4 months of pregnancy	86.3	86.4	86.5	86.4	86.7	87.0
Initiated prenatal care in the first 4 months of pregnancy and attended at least 80 percent of the recommended number of visits	73.6	74.2	74.6	75.1	73.3	74.0

Source: GAO analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics data. | GAO-24-106271

Notes: These measures were based on the Adequacy of Prenatal Care Utilization Index, a measure used to assess prenatal care utilization in the U.S., including by CDC. The number of recommended visits is recommended by the American College of Obstetricians and Gynecologists, adjusted for gestational age. For more information on this index, see J. Martin and M. Osterman, "Changes in Prenatal Care Utilization: United States, 2019–2021," *National Vital Statistics Report*, vol. 72, no. 4 (Hyattsville, Md.: National Center for Health Statistics, May 4, 2023). The margins of error at the 95 percent confidence level for the percentages in this table were no larger than 0.05 percentage points.

According to the National Institutes of Health, an agency within HHS, getting early and regular prenatal care improves the chances of having a healthy pregnancy. However, stay-at-home recommendations, reduced appointment availability, and the desire to minimize the risk of COVID-19 exposure may have resulted in fewer visits for prenatal care in 2020, according to CDC.[42]

According to CDC Pregnancy Risk Assessment Monitoring System survey data, the following reasons were among the most commonly reported for having prenatal appointments canceled or delayed during the pandemic:[43]

- About 16 percent of respondents in 2020 and 7 percent in 2021 said their provider was closed or had reduced hours.[44]

[42]See J. Martin and M. Osterman, "Changes in Prenatal Care Utilization: United States, 2019–2021," *National Vital Statistics Reports*, vol. 72, no. 4 (Hyattsville, Md.: National Center for Health Statistics, May 4, 2023).

[43]The states and jurisdictions that utilized the COVID-19 questionnaire and that are included in the aggregate estimates varies from the core survey. See appendix I for more information.

[44]The 95 percent confidence intervals for the percentage of respondents who said their provider was closed or reduced hours is between 15.1 and 17.1 in 2020 and between 6.3 and 7.6 in 2021.

- About 7 percent of respondents in 2020 and 10 percent in 2021 had to self-isolate due to possible COVID-19 exposure or infection.[45]
- About 8 percent of respondents in 2020 and 7 percent in 2021 had trouble finding care for their children or other family members.[46]

Virtual Prenatal Visits

According to CDC's Pregnancy Risk Assessment Monitoring System survey data, over 30 percent of respondents in 2020 and over 20 percent of respondents in 2021 reported having both in-person and virtual prenatal visits. Of those who did not have a virtual visit in 2020 and 2021, most (about 80 percent) said they prefer in-person visits, and less than 4 percent reported that they lacked technology such as internet or cellular data. See appendix II for more details.

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System data. | GAO-24-106271

Aside from the pandemic, the most common reasons cited by respondents who said they did not get prenatal care as early as they wanted from 2018 through 2021 were not being able to get an appointment when they wanted, not knowing they were pregnant, and their doctor or health plan would not start care earlier.[47]

In addition, our analysis of CDC vital statistics data shows disparities in the timing and use of prenatal care among certain racial and ethnic groups and among different payers, which generally continued in 2020 and 2021.[48] Fewer American Indian or Alaska Native, Black, and Native Hawaiian or Other Pacific Islander women initiated prenatal care in the first 4 months of pregnancy and attended the recommended number of prenatal visits, as compared with White and Asian women. Similarly, fewer women with Medicaid or who self-pay for delivery initiated prenatal care in the first 4 months of pregnancy and attended the recommended number of prenatal visits, as compared with women with private insurance. (See tables 3 and 4.)

[45]The 95 percent confidence intervals for the percentage of respondents who said they had to self-isolate due to possible COVID-19 exposure or infection is between 6.2 and 7.6 in 2020 and between 9.1 and 10.6 in 2021.

[46]The 95 percent confidence intervals for the percentage of respondents who said they had trouble finding care for their children or other family members is between 7.3 and 8.8 in 2020 and between 6.5 and 7.9 in 2021.

[47]This question is not used by all states and jurisdictions participating in the Pregnancy Risk Assessment Monitoring System survey. See appendix I for more information.

[48]The payer is the primary source of payment for the delivery at the time of delivery, according to CDC documentation. We also report these data by age in appendix II.

Table 3: Percentage of Women Who Initiated Prenatal Care in the First 4 Months of Pregnancy and Attended At Least 80 Percent of Recommended Number of Visits by Race and Ethnicity, 2016—2021

Race and ethnicity	2016	2017	2018	2019	2020	2021
American Indian or Alaska Native	59.1	59.7	59.6	60.9	59.1	61.3
Asian	77.5	78.4	79.0	79.1	76.5	77.8
Black	66.4	66.9	67.6	68.2	67.3	68.5
Native Hawaiian or Other Pacific Islander	49.5	50.7	49.4	48.1	47.1	47.2
White	80.5	80.9	81.2	81.8	79.6	80.5
Multiracial	72.8	73.2	73.3	73.6	71.6	73.1
Hispanic	70.8	71.6	71.8	71.6	69.5	69.7

Source: GAO analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics data. | GAO-24-106271

Notes: These measures were based on the Adequacy of Prenatal Care Utilization Index, a measure used to assess prenatal care utilization in the U.S., including by CDC. The number of recommended visits is recommended by the American College of Obstetricians and Gynecologists, adjusted for gestational age. For more information on this index, see J. Martin and M. Osterman, "Changes in Prenatal Care Utilization: United States, 2019–2021," *National Vital Statistics Report*, vol. 72, no. 4 (Hyattsville, Md.: National Center for Health Statistics, May 4, 2023). The margins of error at the 95 percent confidence level for the percentages in this table were no larger than 0.05 percentage points. American Indian or Alaska Native, Asian, Black or African American (Black), Native Hawaiian or Other Pacific Islander, White, and multiracial race groups are not Hispanic or Latina (Hispanic); Hispanic women may be of any race.

Table 4: Percentage of Women Who Initiated Prenatal Care in the First 4 Months of Pregnancy and Attended At Least 80 Percent of Recommended Number of Visits by Payer for the Delivery, 2016—2021

Payer for the delivery	2016	2017	2018	2019	2020	2021
Private insurance	83.9	84.3	84.6	84.8	82.0	82.6
Medicaid	68.9	69.3	69.4	69.5	68.3	69.2
Other[a]	68.9	70.2	70.8	72.9	70.8	70.4
Self-pay[b]	52.6	54.4	54.8	55.4	53.8	54.6

Source: GAO analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics data. | GAO-24-106271

Notes: These measures were based on the Adequacy of Prenatal Care Utilization Index, a measure used to assess prenatal care utilization in the U.S., including by CDC. The number of recommended visits is recommended by the American College of Obstetricians and Gynecologists, adjusted for gestational age. For more information on this index, see J. Martin and M. Osterman, "Changes in Prenatal Care Utilization: United States, 2019–2021," *National Vital Statistics Report*, vol. 72, no. 4 (Hyattsville, Md.: National Center for Health Statistics, May 4, 2023). The margins of error at the 95 percent confidence level for the percentages in this table were no larger than 0.05 percentage points. Payer is the primary source of payment for the delivery.

[a]Other payers in this data source include other federal and state government programs, such the Indian Health Service or military health care coverage, and charity care.

[b]Self-pay in this data source means no third-party payer was identified.

Further, according to our analysis of CDC vital statistics data, about 6 percent of women overall initiated prenatal care late (in the third trimester) or had no prenatal care each year from 2016 through 2021. During these years, more American Indian or Alaska Native, Black, and Native

Hawaiian or Other Pacific Islander women reported having late or no prenatal care each year as compared with White or Asian women. In addition, more women with Medicaid or who self-pay for delivery reported having late or no prenatal care each year compared to women with private insurance. The percentage of women who had late or no prenatal care decreased significantly for those who self-pay in 2020 and 2021, yet significant disparities compared to women with private insurance remained consistent.

Delivery during the COVID-19 Pandemic

According to our analysis of CDC vital statistics data, most women gave birth in hospitals or freestanding birthing centers before and during the COVID-19 pandemic. However, the percentage of home births increased by 22 percent from 2019 to 2020 and another 12 percent from 2020 to 2021.

In addition, most respondents to the CDC Pregnancy Risk Assessment Monitoring System survey reported having a husband or partner present at delivery during the pandemic, while about 2 percent of respondents in 2020 and 1 percent of respondents in 2021 said support people were not allowed in the delivery room during the pandemic. This was significantly higher for non-Hispanic Black or African American and Hispanic women as compared with non-Hispanic White women, and women with Medicaid as compared with those with private insurance during pregnancy.

Source: Centers for Disease Control and Prevention (CDC) data. | GAO-24-106271

Postpartum care. According to CDC's Pregnancy Risk Assessment Monitoring System survey data, most women attended a postpartum visit each year, though disparities exist across racial and ethnic groups and insurance types. Specifically, the estimated percentage of respondents who attended a postpartum visit was 91 percent in 2018 and 2019, 88 percent in 2020, and 91 percent in 2021.[49]

Virtual Postpartum Visits

According to CDC's Pregnancy Risk Assessment Monitoring System survey data, about 11 percent of respondents reported having both in-person and virtual postpartum visits in 2020 and 2021.

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System data. | GAO-24-106271

[49]The 95 percent confidence intervals for the percentage of respondents who attended a postpartum appointment confidence intervals is between 90.1 and 91.0 in 2018, between 90.3 and 91.2 in 2019, between 87.6 and 88.6 in 2020, and between 90.4 and 91.3 in 2021.

The states and jurisdictions included in the data we reviewed vary from year to year, because only data from those that met a 50 percent response threshold are included in the aggregate data. Any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. See appendix I for more information.

According to these data, a larger percentage of White and Asian or Pacific Islander respondents were estimated to have attended a postpartum visit each year as compared with other racial and ethnic groups.[50] Additionally, a larger percentage of respondents with private insurance after pregnancy reported attending a postpartum visit—about 10 to 20 percent greater than other insurance types—each year. (See tables 5 and 6.)

Table 5: Estimated Percentage of Respondents Who Attended a Postpartum Visit by Race and Ethnicity, 2018—2021

Race and ethnicity	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Asian/Pacific Islander	91.8 (90.1, 93.5)	92.8 (91.2, 94.4)	90.0 (88.2, 91.7)	91.5 (89.9, 93.2)
Black	86.7 (85.3, 88.0)	87.9 (86.6, 89.1)	85.0 (83.7, 86.4)	87.4 (86.0, 88.8)
White	92.9 (92.4, 93.4)	92.9 (92.4, 93.5)	91.1 (90.5, 91.7)	93.3 (92.8, 93.9)
All other racesa	86.5 (84.5, 88.6)	87.1 (84.5, 89.8)	84.4 (81.9, 86.8)	87.3 (85.0, 89.6)
Hispanic	86.3 (85.1, 87.4)	86.8 (85.5, 88.2)	82.6 (81.2, 84.0)	86.0 (84.7, 87.3)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that participate in the Pregnancy Risk Assessment Monitoring System survey and had at least a 50 percent response rate. As a result, the states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parentheses and provide information on the relative precision of an estimate. Asian/Pacific Islander, Black or African American (Black), White, and all other race groups are not Hispanic or Latina (Hispanic); Hispanic women may be of any race.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race, according to CDC officials.

Table 6: Estimated Percentage of Respondents Who Attended a Postpartum Visit by Insurance after Pregnancy, 2018—2021

Insurance after pregnancy	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Private insurancea	95.4 (95.0, 95.8)	95.9 (95.4, 96.3)	93.5 (93.0, 93.9)	95.1 (94.6, 95.5)
Medicaid	84.8 (83.8, 85.8)	84.8 (83.7, 85.9)	83.3 (82.3, 84.3)	86.3 (85.3, 87.2)
Otherb	86.4 (82.2, 90.5)	84.1 (78.6, 89.6)	72.9 (65.4, 80.5)	86.3 (80.6, 92.1)
No insurancec	83.5 (81.8, 85.3)	82.1 (80.1, 84.1)	74.7 (71.8, 77.6)	78.5 (75.6, 81.4)

Source: Centers for Disease Control and Prevention, Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that participate in the Pregnancy Risk Assessment Monitoring System survey and had at least a 50 percent response rate. As a result, the states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are

[50]We also report these data by age group in appendix II.

noted in parentheses and provide information on the relative precision of an estimate. Insurance after pregnancy is the type of insurance respondents reported having after pregnancy.

[a]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[b]Other insurance in this data source includes other state-specific government plans or programs.

[c]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

The most common reasons that respondents from seven participating states and jurisdictions provided for not attending a postpartum visit were they "felt fine" and did not think they needed to attend, or they had "too many things going on," according to CDC Pregnancy Assessment Monitoring System data.[51] In 2020, among those who reported "other" reasons for not attending a postpartum visit, 26 respondents said they did not attend a postpartum visit due to a COVID-19 pandemic-related reason, according to CDC officials. (See app. II for more details.)

HHS Has Not Used Some Key Practices to Assess Performance of Selected Maternal Health Efforts

We found HHS offices and agencies have taken steps to assess the performance of the *Maternal Health Blueprint's* implementation—HHS's guiding strategy document for improving maternal health—as well as the AIM and PQC programs. HRSA has taken steps and has plans to use key performance management practices to assess the AIM program's performance. However, we also found that the offices overseeing the blueprint's implementation and CDC, which oversees the PQC program, are not fully utilizing key performance management practices that could help ensure they are meeting their goals for improving maternal health across the country.

HHS Offices Intend to Assess the *Maternal Health Blueprint's* Performance, but Have Not Provided Information on How They Will Do So

Within HHS, the Office on Women's Health and the Office of the Assistant Secretary for Planning and Evaluation are leading the department's efforts to develop, oversee, and coordinate its strategy for improving

[51]This question is not used by all states and jurisdictions participating in the Pregnancy Risk Assessment Monitoring System survey. See appendix I for more information.

maternal health, including assessing progress for implementation of the *Maternal Health Blueprint's* goals. According to officials, the department intends to assess the progress or performance of the efforts described by the blueprint. However, as of September 2023, the offices had not indicated how they will do so. As a result, it is unclear whether this forthcoming assessment will include some of the key performance management practices we have identified in prior work. (See textbox for key performance management practices.)

Key Performance Management Practices for Federal Agencies

Our previous work has identified performance management as a process by which federal agencies establish key practices to help effectively build and use evidence to manage the performance of activities or programs. Taken as a whole, performance management activities help an agency define what it is trying to achieve, determine how well programs are performing, and identify how to improve results. This process includes the following:

- **Establishing goals that communicate the results that an agency seeks to achieve.** Goals guide the agency's programs and allow decision makers, staff, and stakeholders to assess performance by comparing planned and actual results. Goals cover two different time frames:
    - Long-term goals (also known as strategic goals and objectives) are the desired outcomes for the agency's programs and set a general direction for a program's efforts. To ensure progress can be assessed, each long-term goal is broken down into one or more near-term goals.
    - Near-term goals (also known as performance goals) define the specific results a program is expected to achieve in the near-term, and include quantitative targets and time frames against which performance can be measured.
- **Establishing performance measures and measuring progress toward goals.** Performance measures are concrete, objective, observable conditions that allow the agency to assess the progress made toward achieving each near-term goal. Agencies collect evidence, which includes performance information, such as performance measures, to measure actual performance toward results.
- **Using performance information.** Agencies use performance measures and information to regularly assess results and inform decisions to ensure further progress toward achieving goals.

Source: GAO. | GAO-24-106271

The blueprint presents priorities and highlights specific federal actions for programs that will work toward improving maternal health and advancing equity. It establishes five long-term goals that, according to HHS officials,

also reflect the department's key priorities for improving maternal health.[52] (See table 7.)

Table 7: Long-Term Goals for the Maternal Health Blueprint Assessment

Goals
Increase access to and coverage of comprehensive high-quality maternal health services, including behavioral health services
Ensure those giving birth are heard and are decision makers in accountable systems of care
Advance data collection, standardization, harmonization, transparency, and research
Expand and diversify the perinatal workforce
Strengthen economic and social supports for people before, during, and after pregnancy

Source: White House *Blueprint for Addressing the Maternal Health Crisis*, interviews with Office on Women's Health and Assistant Secretary for Planning and Evaluation officials, and prior GAO reports. | GAO-24-106271

Note: Long-term goals are the desired outcomes for the agency's programs and set a general direction for a program's efforts.

Officials from the Office on Women's Health and the Office of the Assistant Secretary for Planning and Evaluation said they are developing a performance measurement strategy in collaboration with agency partners to assess the nation's progress in addressing the maternal health crisis and are preparing a report that will provide an update on HHS initiatives, such as those in the blueprint. Officials said they worked with a contractor during fiscal year 2023 to identify measures that could be included in the performance measurement strategy. The measurement strategy may include topics related to maternal health outcomes, access to care and coverage of services, and health-related social needs, according to the officials.

However, as of September 2023, officials from the Office on Women's Health and the Office of the Assistant Secretary for Planning and Evaluation said they had not yet made a final decision as to what would be included as part of their performance measurement strategy. These officials also said they are developing a report for Congress that they anticipate will be publicly released by Spring 2024, which will include

[52]Each of the *Maternal Health Blueprint*'s long-term goals has associated "actions" that identify how HHS and other agencies can work to achieve the goals and relate to specific federal activities or programs. For example, under the long-term goal "Advance data collection, standardization, harmonization, transparency, and research," one action is to improve data collection in states, hospitals, health centers, and insurance programs to support better surveillance and quality measurement, and to improve outcomes. One example listed under this action is CDC launching new questions in the Pregnancy Risk Assessment Monitoring System data set about an individual's experience before, during, and after pregnancy, such as experiences of discrimination and respectful care.

updates on HHS actions described in the blueprint, as well as the measurement strategy.

Without information on what the strategy will include, it is not clear whether the strategy will incorporate key performance management practices identified in our past work such as near-term goals with quantitative targets and time frames to define intended results, and associated performance measures to assess progress.[53] Incorporating such practices into this assessment would help the Office on Women's Health and Office of the Assistant Secretary for Planning and Evaluation ensure its assessment will be effective and allow the department to make needed improvements as warranted.

HRSA Has Incorporated Key Performance Practices for the Alliance for Innovation on Maternal Health Program

Based on our review of program documentation and interviews with agency officials, we found HRSA has incorporated and intends to use the three key performance management practices: establishing long-term and near-term goals, establishing performance measures, and using performance information to assess results. If implemented as described by agency officials, this will allow the agency to monitor implementation of AIM patient safety bundles, which agency officials said help improve the quality of maternal health care service delivery.[54]

Health Equity in Alliance for Innovation on Maternal Health (AIM) Patient Safety Bundles

As of October 2023, AIM has eight patient safety bundles—sets of evidence-based and best practices intended to address leading known causes of preventable maternal mortality and severe maternal morbidity—for program teams to implement. Each AIM patient safety bundle includes a section on respectful, equitable, and supportive care. For example, the Sepsis in Obstetric Care bundle reminds providers to engage in open, transparent, and empathetic communication with pregnant and postpartum individuals and their support networks about their diagnosis and recommended treatment plan, in alignment with the patient's health literacy, culture, language, and accessibility needs.

[53]See GAO-23-105289, GAO-23-105460, and GAO-23-105650.

[54]For purposes of this analysis, we focused our review of HRSA's performance management efforts on the AIM funding opportunity that awarded AIM program teams for the performance period from September 2023 through August 2027. According to the funding documentation, the award is intended to increase the reach and quality of patient safety bundle implementation and address challenges AIM program teams have identified previously, such as those related to data quality and collection. Prior to September 2023, some AIM program teams received funding through the American College of Obstetricians and Gynecologists' AIM technical assistance award to support bundle implementation, according to HRSA officials.

Source: AIM program documentation from Health Services and Resources Administration and American College of Obstetricians and Gynecologists. | GAO-24-106271

HRSA established three long-term goals that identify desired outcomes for the AIM program, according to program documentation and officials. HRSA officials said that given the high rates of maternal mortality and severe maternal morbidity in the U.S., AIM's long-term goals are related to the program's overall objective of increasing access to safe, reliable, and quality care through the implementation of AIM patient safety bundles and the collection of data to help address potential disparities in maternal health.

Alliance for Innovation on Maternal Health (AIM) Technical Assistance Center

The AIM Technical Assistance Center provides support to AIM program teams throughout the U.S. Specifically, this includes creating toolkits, offering trainings and peer learning opportunities, and supporting program teams' data capacity by addressing challenges in data quality, timeliness, collection, and reporting. In addition, the AIM Technical Assistance Center assists program teams with the long-term sustainability of AIM patient safety bundles within birthing facilities to help move bundle implementation into standard practice.

Source: Health Resources and Services Administration's AIM program documentation. | GAO-24-106271

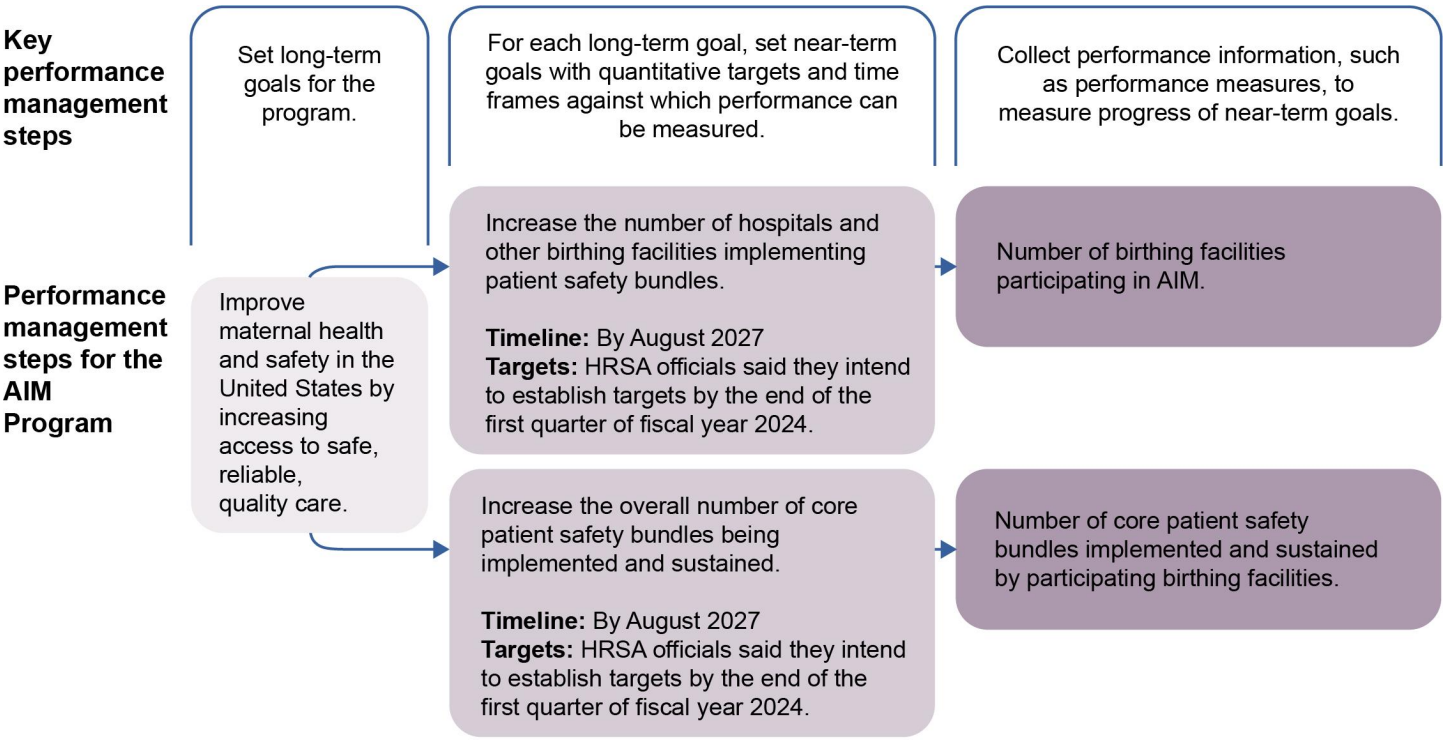
In addition, HRSA established two near-term goals against which performance can be measured, according to program documentation and officials. According to HRSA officials, the time frame for the near-term goals is the performance period for the current funding cycle, September 2023 through August 2027. Officials said they intend to set targets for the near-term goals by the end of the first quarter of the fiscal year 2024 funding cycle, after holding an initial meeting to discuss setting baseline targets with the AIM program teams that were awarded funding in September 2023. Officials said they had not originally established quantitative targets when they established their goals, because they needed to identify baseline performance information from AIM program teams, which had not been selected at that time, to inform the targets.[55] Officials said that setting baseline information would help them to review individual program teams' abilities to implement AIM patient safety bundles.

HRSA also collects two quantitative measures to measure progress against the near-term goals, including the number of facilities participating in AIM, according to program documentation and officials. AIM program

[55]According to officials, the baseline information and any targets would depend on which program teams were awarded funding. Program teams enrolled in AIM at different periods, and therefore earlier enrollees are more established and at a different stage of implementation compared to AIM program teams that enrolled later.

teams are expected to report these measures, among other information, to HRSA biannually.[56] According to HRSA officials, these performance measures align with the near-term goals, and are designed to assess expansion of the AIM program. See figure 7 for an example of the alignment among key performance management practices.

Figure 7: Example of Linkages between Long-Term Goals, Near-Term Goals, and Performance Measures for the Alliance for Innovation on Maternal Health (AIM) Program



Source: GAO analysis of information from Health Resources and Services Administration (HRSA) officials, AIM program documentation, and GAO reports. | GAO-24-106271

[56]Program teams are also required to submit data on the AIM patient safety bundles—such as severe maternal health outcomes based on race and ethnicity—to an AIM program data portal, according to program documentation. HRSA officials said the information submitted to this data portal is intended to help program teams and birthing facilities be more aware of racial and ethnic disparities to address the potential causes of disparities. Further, HRSA officials said AIM program teams report performance information to HRSA in voluntary statements that allow the program teams to review and analyze the data collected. According to HRSA officials, the statements describe accomplishments based on the data teams collected about AIM patient safety bundle implementation.

Accessible Text for Figure 7: Example of Linkages between Long-Term Goals, Near-Term Goals, and Performance Measures for the Alliance for Innovation on Maternal Health (AIM) Program

Category	Category steps
Key performance management steps	• Set long-term goals for the program. • For each long-term goal, set near-term goals with quantitative targets and time frames against which performance can be measured. • Collect performance information, such as performance measures, to measure progress of near- term goals.
Performance management steps for the AIM program (one of two)	• Improve maternal health and safety in the United States by increasing access to safe, reliable, quality care. • Increase the number of hospitals and other birthing facilities implementing patient safety bundles. • Timeline: By August 2027 • Targets: HRSA officials said they intend to establish targets by the end of the first quarter of fiscal year 2024. • Number of birthing facilities participating in AIM.
Performance management steps for the AIM program (two of two)	• Improve maternal health and safety in the United States by increasing access to safe, reliable, quality care. • Increase the overall number of core patient safety bundles being implemented and sustained. • Timeline: By August 2027 • Targets: HRSA officials said they intend to establish targets by the end of the first quarter of fiscal year 2024. • Number of core patient safety bundles implemented and sustained by participating birthing facilities.

Source: GAO analysis of information from Health Resources and Services Administration (HRSA) officials, AIM program documentation, and GAO reports. I GAO-24-106271

Note: HRSA officials stated that both performance measures relate to both near-term goals shown in this figure, because as the number of participating facilities increases, it simultaneously increases the discrete number of AIM patient safety bundles being implemented.

HRSA officials said they plan to review the performance measures collected from AIM program teams to understand how the program is progressing and to identify any challenges. For example, officials said they would identify strategies to address program growth if the near-term goals are not showing progress, such as if they do not see an increase in the number of birthing facilities implementing patient safety bundles.

CDC Has Incorporated Some Key Performance Practices for the Perinatal Quality Collaborative Program, but Near-Term Goals Do Not Have Targets

Based on our review of program documentation and interviews with agency officials, we found that CDC has incorporated some performance management practices for the PQC program, such as establishing goals.

However, the agency has not established quantitative targets for each of the program's near-term goals, which would allow the agency to improve how it assesses PQC program performance.[57]

Perinatal Quality Collaborative (PQC) Programs and COVID-19

In September 2021, CDC provided supplemental funding to some PQCs to address COVID-19 related challenges such as to support implementation of best practices for increasing efforts to reduce COVID-19 vaccine hesitancy, as well as increasing equitable access and administration of the vaccine.

Source: Centers for Disease Control and Prevention (CDC) PQC documentation. | GAO-24-106271

National Network of Perinatal Quality Collaboratives

The National Network of Perinatal Quality Collaboratives provides technical assistance and capacity building to all Perinatal Quality Collaborative (PQC) program teams nationwide. For example, they conduct an annual review of all PQCs that is used to help program teams with implementation of quality improvement initiatives and increase participation of facilities. Stakeholders from the National Network of Perinatal Quality Collaboratives said information from this annual assessment allows them to offer more tailored technical assistance and trainings to PQC program teams.

Source: Centers for Disease Control and Prevention's PQC documentation and interviews with National Network of PQCs officials. | GAO-24-106271

CDC established one long-term goal that defines desired outcomes for the PQC program, and five associated near-term goals, according to program documentation and officials. The goals are intended to help increase the capacity of PQC program teams to conduct quality improvement initiatives and ensure equitable distribution of benefits from the initiatives, according to program documentation. According to CDC officials, the time frame for the key near-term goals is the performance

[57]For purposes of this analysis, we focused our review of CDC's performance management efforts on the PQC funding opportunity for the performance period from September 2022 through September 2027. According to officials, this funding was awarded to 36 PQC program teams operating within 37 states, with one program team working across North Dakota and South Dakota. This funding represents an expansion in the number of PQCs funded by CDC; according to officials, CDC funded 13 PQCs under the previous funding agreement. Other PQC program teams are not funded by CDC, but can receive funding from other federal agencies, state agencies, private foundations, and hospital associations, among others.

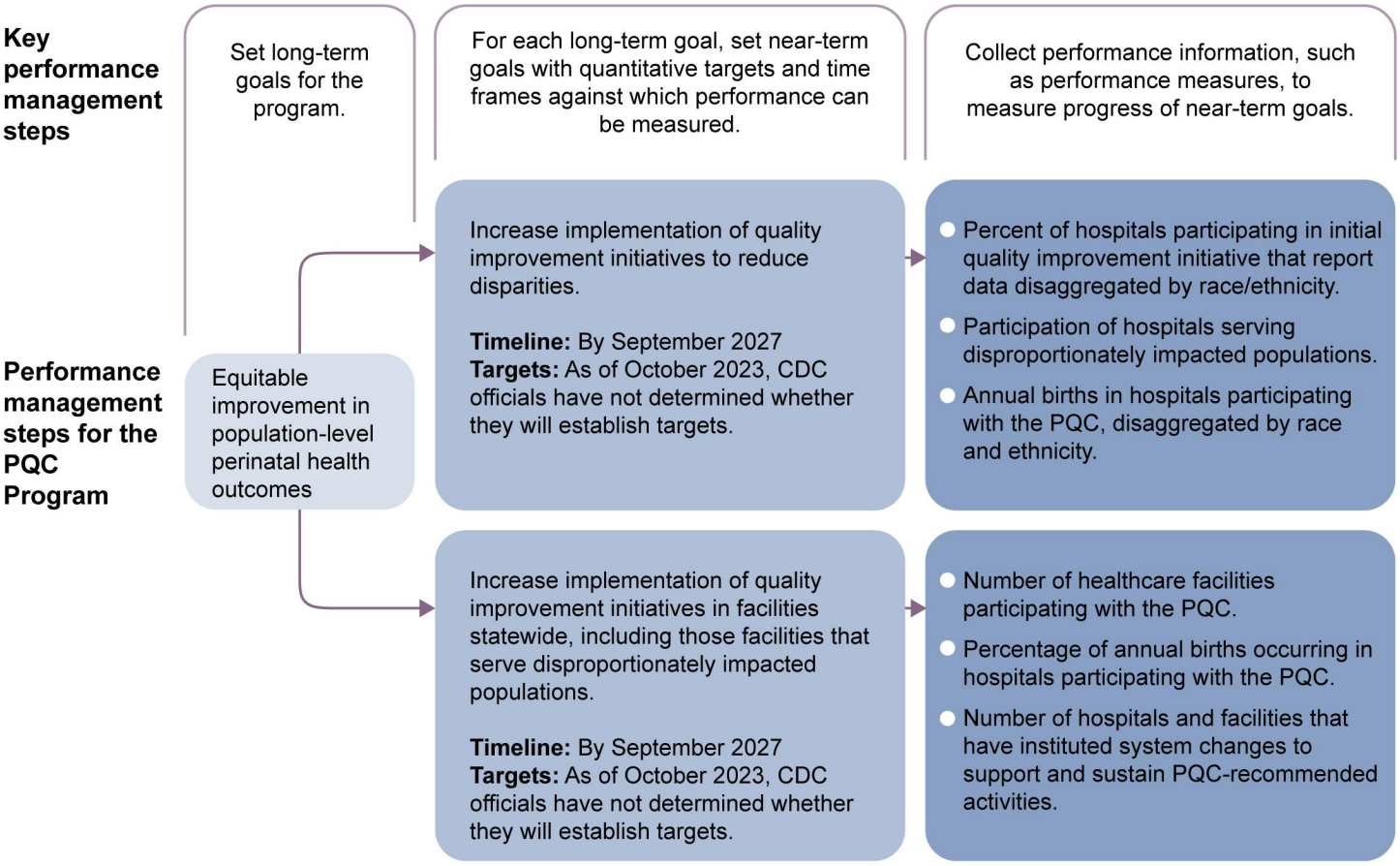
period for the current funding cycle, September 2022 through September 2027.[58]

CDC also collects performance measures from program teams, among other performance information, to assess the PQC program, according to program documentation. PQC program teams are required to report these performance measures to CDC annually in a performance report.[59] See figure 8 for an example of the alignment among key performance management practices.

[58]Program teams are expected to meet three of the five near-term goals during the current period of performance (September 2022 to September 2027), according to PQC program requirements in the funding opportunity. CDC does not expect program teams to meet two near-term goals during the current period of performance. According to officials, they included these two near-term goals to convey their importance in achieving the program's objectives and it remains important for program teams to undertake activities related to these goals. However, CDC guidance outlines requirements for the types of goals that require performance measures, which these two near-term goals do not meet, according to officials.

[59]PQC requirements in the funding opportunity state that the annual performance report also includes narratives highlighting any successes the PQC's quality improvement initiatives had related to improving perinatal care and outcomes.

Figure 8: Example of Long-Term Goal, Near-Term Goals, and Performance Measures for the Perinatal Quality Collaborative (PQC) Program



Source: GAO analysis of information from Centers for Disease Control and Prevention (CDC) officials, PQC program documentation, and GAO reports. | GAO-24-106271

Accessible Text for Figure 8: Example of Long-Term Goal, Near-Term Goals, and Performance Measures for the Perinatal Quality Collaborative (PQC) Program

Category	Category steps
Key performance management steps	• Set long-term goals for the program. • For each long-term goal, set near-term goals with quantitative targets and time frames against which performance can be measured. • Collect performance information, such as performance measures, to measure progress of near-term goals.

Category	Category steps
Performance management steps for PQC program (one of two)	• Equitable improvement in population-level perinatal health outcomes • Increase implementation of quality improvement initiatives to reduce disparities. • Timeline: By September 2027 • Targets: As of October 2023, CDC officials have not determined whether they will establish targets. • Percent of hospitals participating in initial quality improvement initiative that report data disaggregated by race/ethnicity. • Participation of hospitals serving disproportionately impacted populations. • Annual births in hospitals participating with the PQC, disaggregated by race and ethnicity.
Performance management steps for PQC program (two of two)	• Equitable improvement in population-level perinatal health outcomes • Increase implementation of quality improvement initiatives in facilities statewide, including those facilities that serve disproportionately impacted populations. • Timeline: By September 2027 • Targets: As of October 2023, CDC officials have not determined whether they will establish targets. • Number of healthcare facilities participating with the PQC. • Percentage of annual births occurring in hospitals participating with the PQC. • Number of hospitals and facilities that have instituted system changes to support and sustain PQC-recommended activities.

Source: GAO analysis of information from Centers for Disease Control and Prevention (CDC) officials, PQC program documentation, and GAO reports. I GAO-24-106271

Notes: According to the PQC program documentation, for these performance measures, a hospital is a licensed institution with at least six beds whose primary function is to provide diagnostic and therapeutic patient services for medical conditions, has an organized physician staff, and provides continuous nursing services under the supervision of registered nurses. A facility is defined as any health care entity other than a hospital, which may include free-standing birth centers, community health centers, outpatient provider practices, and local emergency medical services, and urgent care centers.

CDC officials said the agency plans to use the performance information collected from PQC program teams to assess opportunities for improvement and provide feedback to teams, such as how to improve data quality, and refine technical assistance. However, according to our review of PQC program documentation, the near-term goals do not have quantitative targets, such as targets that specify the anticipated number of health care facilities participating with PQC activities. As of October 2023, CDC officials had not determined whether they will establish targets for the near-term goals, because they were reviewing the initial year of baseline information from PQC program teams.

Our prior work describes how establishing quantitative targets for near-term goals can help agencies measure program performance and progress.[60] Establishing targets for the PQC programs' near-term goals would enable CDC to better define expected performance and results, against which the agency can compare actual PQC program performance. With this, the agency would be better positioned to assess how well this key maternal health quality improvement program is working to meet its program goals.

Selected PQC and AIM Program Teams' Structures, Activities, and Reported Challenges

Selected PQC and AIM Programs' Structures and Activities

Officials from the selected PQC and AIM program teams we reviewed discussed the structures through which they implement their maternal health activities, and the high levels of integration across the two program teams operating within the same state.[61] For instance, three PQC program teams we reviewed are fully integrated with the AIM program at the state level and lead implementation of the AIM bundles in their state. In other cases, separate teams lead the two programs, but collaborate closely with each other. (See table 8.) Program team officials also said they collaborate with a range of partners, such as the state Medicaid agency or health department.

Table 8: Selected Perinatal Quality Collaborative (PQC) and Alliance for Innovation on Maternal Health (AIM) Program Teams

PQC program team	Year PQC first received funding from the Centers for Disease Control and Prevention	AIM program team	Year enrolled in AIM
Northwestern University (Illinois)	2014	Northwestern University (Illinois)	2015
Mississippi Public Health Institute	2017	Mississippi State Department of Health	2016
New Jersey Hospital Association	2017	New Jersey Hospital Association	2016
Virginia Commonwealth University	2017	Virginia Commonwealth University	2017

[60]See GAO-23-105289, GAO-23-105460, and GAO-23-105650.

[61]We use the term "program team" to refer to the teams that implement the PQC and AIM program activities at the state level. Program teams may lead the PQC program, the AIM program, or both programs in their states.

PQC program team	Year PQC first received funding from the Centers for Disease Control and Prevention	AIM program team	Year enrolled in AIM
Washington State Department of Health	2022	Washington State Hospital Association	2019

Source: Interviews with and written responses from AIM and PQC program team officials, program team documentation, and documentation from the AIM Technical Assistance Center. | GAO-24-106271

Note: The program team listed is the entity that led the program as of July 2023.

Program teams work to support implementation of patient safety bundles in facilities in their areas—sets of evidence-based and best practices that may improve patient outcomes and assist with addressing maternal mortality and severe maternal morbidity, according to HRSA—among other initiatives.[62] The program teams in our review implemented between two and four patient safety bundles each in their states at participating hospitals and other birthing facilities. Collectively, this represented five of the eight total available bundles, as of May 2023, according to documentation from the AIM Technical Assistance Center.[63] See table 9 for examples of program teams' activities to implement patient safety bundles.

Table 9: Examples of Activities to Implement Patient Safety Bundles by Selected Perinatal Quality Collaborative (PQC) and Alliance for Innovation on Maternal Health (AIM) Program Teams

Program team	Activity
Northwestern University (Illinois)	From 2016 through 2017, the PQC facilitated and supported birthing facilities' implementation of an initiative based on the AIM bundle to reduce maternal hypertension. This initiative helped participating facilities to increase the percentage of women with severe maternal hypertension treated within 60 minutes from 41 percent to 85 percent, and decrease the risk of death associated with hypertension from 15 percent to 9 percent among pregnant and postpartum women at birthing facilities participating in the initiative, according to program team officials and documentation.
Mississippi State Department of Health	From 2019 to 2022, the PQC supported birthing facilities' implementation of the AIM hypertension bundle. This helped to increase the percentage of participating facilities with established unit policies and procedures to respond to hypertensive emergencies from 24 percent to 88 percent, according to documentation from the AIM Technical Assistance Center.

[62]The program teams in our review implemented AIM bundles or other initiatives to address maternal health issues in their areas, according to program team officials and program teams' reports describing their activities, and documentation from the AIM Technical Assistance Center. For example, one program team developed videos telling patients' stories of how providers improved the patients' outcomes.

[63]The patient safety bundles are the primary building blocks of the AIM program's efforts to address the leading known causes of preventable severe maternal morbidity and mortality in the U.S., according to the AIM Technical Assistance Center. In total, there are eight bundles that focus on topics such as obstetric hemorrhage, severe hypertension in pregnancy, and perinatal mental health conditions, as of October 2023.

Program team	Activity
New Jersey Hospital Association	From 2017 through 2021, the PQC supported birthing hospitals' implementation of the AIM bundle to reduce rates of C-section births. This helped decrease the overall C-section rate for birthing hospitals in the state from 32.31 to 27.77 per 100 births, according to program team documentation.
Virginia Commonwealth University	In 2021, the PQC began implementation of an initiative based on three AIM bundles that addresses maternal health topics from pregnancy through the postpartum period. The topics include hypertension, diabetes, mental health, and others. This initiative had the highest level of birthing facility engagement since the PQC's establishment, according to program team documentation.
Washington State Hospital Association	In 2022, the PQC began implementation of an initiative based on the AIM substance use disorder bundle. According to program team documentation, more than 80 percent of birthing hospitals in the state are participating in the initiative.

Source: Interviews with and written responses from AIM and PQC program team officials and documentation from program teams and the AIM Technical Assistance Center. | GAO-24-106271

Note: AIM patient safety bundles are sets of evidence-based and best practices intended to address leading known causes of preventable maternal mortality and severe maternal morbidity.

Program team officials said they use various sources of information to inform selection of their initiatives, including which bundles to implement. For example, they said they use state Maternal Mortality Review Committee report recommendations and data, input from stakeholders (e.g., hospitals and community advisory boards), and state-based data sources (e.g., state maternal health data center).[64]

Program teams work with birthing facilities to implement PQC and AIM initiatives, according to the program team officials we interviewed and documents we reviewed. For example, their work with birthing facilities to support implementation includes providing toolkits to guide implementation and providing technical assistance through webinars, coaching calls, and site visits. Program team officials also identified factors that supported facility engagement. For example, one program team's report noted that the state hospital association's involvement helped to engage facilities, because they had existing relationships. Officials from another program team said facilities found the team's data reports helpful, because they allow facilities to compare their data to other facilities' data.

Program teams collect data on the implementation of initiatives, such as the number of learning sessions held to increase maternal health-related knowledge or skills, and program results, such as C-section rates. Program teams use these data for such purposes as to assess facilities'

[64]Maternal Mortality Review Committees are multidisciplinary committees that convene at the state or local level to comprehensively review deaths during or within a year of pregnancy, and develop recommendations for action to prevent similar deaths in the future. CDC provides funding to support Maternal Mortality Review Committees in 44 states and two U.S. territories, as of October 2023.

progress in implementing initiatives and to inform technical assistance. For example, one program team official said that birthing facilities were able to sustain improvements from a maternal hypertension initiative because they continued collecting and tracking their data after the initiative ended.

The program teams varied in the extent to which they collect or use data on racial and ethnic disparities. For example, according to reports we reviewed from one program team, the team implemented an initiative to improve care for pregnant and postpartum women with opioid use disorder and was able to use data to show the resulting reduction in the disparity in receipt of medication-assisted treatment between Black and White individuals giving birth.[65] Other program teams were in earlier stages of using data on race and ethnicity. For example, officials from one program team said they collect data that can be stratified by race and ethnicity, but they have not analyzed these data to determine the connection between their initiatives and reductions in disparities in maternal health outcomes.

Program Team Calls with Birthing Facilities during COVID-19

According to an official from the Illinois Perinatal Quality Collaborative program team, the program team held regular calls to support birthing facilities during the COVID-19 pandemic. During these calls, the program team held panel discussions with leaders about maternal health topics, such as data and obstetric cases from birthing facilities. The state health department also shared information and resources during the calls. According to a program team official, the regular COVID-19 calls helped facilities to develop strategies and to create a quick response to the pandemic. The program team official said that the state health department surveyed birthing hospitals and found that 98 percent of birthing hospitals attended the calls and were getting information about how to manage the pandemic from the calls.

Source: Interview with an Illinois Perinatal Quality Collaborative program team official. | GAO-24-106271

Selected Program Teams Reported Challenges

According to program team officials we interviewed and documentation we reviewed, program teams experienced challenges implementing the PQC and AIM initiatives. For example:

- **Data challenges,** such as lack of consensus among clinicians on data definitions, incomplete data from facilities, and the use of different data systems. For example, officials from one program team said that they may calculate C-section rates differently than the state

[65]Medication-assisted treatment—which combines behavioral therapy and the use of certain medications, such as buprenorphine—has been shown to be effective at reducing the misuse of or addiction to opioids and increasing treatment retention.

department of health due to differences in time periods covered by the data sources. An official from another program team noted it can be difficult for facilities to report the program metrics from electronic medical records, because facilities use a different data system than the program's data system.

- **Staffing challenges for program teams,** such as staff turnover, insufficient staff, and existing staff not having time to complete certain tasks, including data review. For example, one program team official said their team had 100 percent staff turnover when the entity leading the program changed. Officials from a different program team said they have not had a full-time employee dedicated to their program, which negatively affects their ability to operate the program and provide technical assistance to facilities.
- **Facility engagement challenges,** such as facilities' need to prioritize other efforts; closure of birthing facilities or labor and delivery units; lack of facility leadership support; and facility workforce issues, such as staff turnover or staffing shortages. For example, officials from one program team said that when facilities have too many competing priorities, quality improvement initiatives, such as those supported by program teams, tend to be one of the first activities cut. Another program team surveyed facilities about their implementation of patient safety bundles and found that at least one facility stopped implementing each of the program's patient safety bundles due to workforce issues and other priorities.
- **Collaboration challenges** with other maternal health efforts, such as competition between partners for resources or work on certain topics and competing priorities. For example, one program team official said it can be difficult to find time to collaborate when the team is busy meeting grant requirements. Officials from another program team said it takes significant time and resources to maintain partnerships, such as when they need to cultivate new relationships due to staff turnover.

The COVID-19 pandemic exacerbated some of these challenges and affected program teams' ability to implement program initiatives, according to program team officials we interviewed and program team reports we reviewed. For example, one program team report noted that staff turnover resulting from COVID-19 has had a negative effect on facilities' ability to remain engaged or reengage in program initiatives. Program team officials said their programs and facilities paused or slowed existing initiatives, including certain tasks like data entry, or delayed starting new initiatives to prioritize the pandemic response. However, at the time of our interviews, program teams had resumed or were planning to resume these activities. For example, officials from one program team

said they were nearing completion of one of their initiatives when the pandemic began. However, the officials said that facilities needed more time to achieve the initiative goals so the program team extended the initiative until facilities could refocus on it.

According to program team officials and documentation, program teams were able to support facilities during the pandemic with activities such as hosting calls or webinars to provide information on COVID-19. Officials from one program team said some facilities applied what they learned from the program team's patient family advisory council learning activities to their COVID-19 responses to guide decisions about visitation hours and policies around labor and childbirth. An official from another program team said that in addition to providing COVID-19 webinars and calls for birthing facilities, the program team developed a webpage that housed maternal health-related COVID-19 information, which they updated as the American College of Obstetricians and Gynecologists or CDC published new information and as facilities developed resources or protocols.

Officials from HHS, the National Network of Perinatal Quality Collaboratives, and the AIM Technical Assistance Center said they support program teams in addressing challenges by providing technical assistance, such as holding monthly meetings with program teams, engaging subject matter experts, and sharing how other program teams have addressed such challenges. In addition, HRSA awarded additional funding to AIM program teams in 2023 to assist in addressing implementation challenges teams identified. Officials from CDC, HRSA, the National Network of Perinatal Quality Collaboratives, and the AIM Technical Assistance Center also said they provided targeted support to program teams during the COVID-19 pandemic. For example, officials from the National Network of Perinatal Quality Collaboratives said they held regular calls with PQC program teams to share information on COVID-19. Officials from the AIM Technical Assistance Center said that due to staff turnover during the COVID-19 pandemic, they created a video to explain the AIM program to new facility staff and encourage their participation.

Conclusions

With among the highest maternal mortality rate of any high-income country in the world, the U.S. is facing a maternal health crisis. Equally troubling are the increasing rate of severe maternal morbidity, prevalence of depression during and after pregnancy, and persistent disparities

among certain groups, notably among Black women and those with Medicaid. Further, the COVID-19 pandemic exacerbated these outcomes and disparities. To address these disparities and improve maternal outcomes, several HHS offices and agencies are implementing maternal health efforts outlined in the *Maternal Health Blueprint,* including the AIM and PQC programs.

Importantly, the Office on Women's Health and Office of the Assistant Secretary for Planning and Evaluation are working toward establishing a performance measurement strategy to assess progress toward achieving the blueprint's goals. As these offices complete this strategy, it will be important for them to incorporate key performance measurement practices—including near-term goals and performance measures—to help ensure the assessment will be effective.

Similarly, CDC has incorporated key performance measurement practices into how it assesses the PQC program, such as developing long- and near-term goals. However, it has not fully incorporated a key practice: ensuring that near-term goals have quantitative targets. Adding such elements would help ensure CDC's ability to measure the performance of PQC program teams' and to compare against expected results.

By incorporating additional key performance management practices across these two efforts, HHS would be better situated to understand the effect their efforts are having on maternal health outcomes and more strategically address the maternal health crisis.

Recommendations for Executive Action

We are making the following two recommendations to HHS:

The Secretary of Health and Human Services should ensure that the Office on Women's Health and Office of the Assistant Secretary for Planning and Evaluation performance strategy includes key performance management practices—including near-term goals with quantitative targets and time frames to define intended results and associated performance measures for the near-term goals—to assess the performance of HHS's maternal health efforts against the *Maternal Health Blueprint's* goals. (Recommendation 1)

The Director of CDC should ensure that the Perinatal Quality Collaborative program establishes quantitative targets for its near-term

goals to provide a basis for comparing planned and actual results. (Recommendation 2)

Agency Comments

We provided a draft of this report to HHS for review and comment. HHS concurred with both of our recommendations and described efforts to address the recommendations. HHS's comments are reproduced in appendix III. HHS also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees the Secretary of the Health and Human Services, and other interested parties. 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 Alyssa M. Hundrup at (202) 512-7114 or hundrupa@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.

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Director, Health Care

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The Honorable Susan M. Collins
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The Honorable Ron Wyden
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Committee on Finance
United States Senate

The Honorable Bernard Sanders
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The Honorable Bill Cassidy
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The Honorable Robin L. Kelly
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House of Representatives

The Honorable Gwen Moore
House of Representatives

The Honorable Ayanna Pressley

House of Representatives

The Honorable Lauren Underwood
House of Representatives

Appendix I: Scope and Methodology for Data Analysis

This appendix provides additional details regarding our analysis or review of the Department of Health and Human Services' (HHS) agencies' data on maternal health. To describe what available HHS data show about maternal health during the COVID-19 pandemic, we reviewed data from three HHS agencies' sources: (1) Centers for Disease Control and Prevention's (CDC) National Vital Statistics System; (2) Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project; and (3) CDC's Pregnancy Risk Assessment Monitoring System.

CDC's National Vital Statistics System. We analyzed data from the National Vital Statistics System to identify maternal deaths and information related to live births, such as prenatal care utilization. We used the vital statistics mortality data and diagnostic code numbers A34, O00–O95, and O98–O99 of *the International Classification of Disease, 10th Revision* to identify maternal deaths, and diagnostic code number O96 to identify late maternal deaths, which are based on the underlying cause of death listed on the death certificate.[1] In addition, we used multiple cause-of-death code U07.1 to identify maternal deaths where COVID-19 was listed as a contributing cause of death on the death certificate from 2020 through 2022.

We obtained the mortality data from CDC WONDER and published CDC reports when the data were not available on WONDER.[2] We also

[1]Underlying cause of death is defined as "the disease or injury which initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury."

[2]See Centers for Disease Control and Prevention, National Center for Health Statistics, *Provisional Multiple Cause of Death by Single Race 2018 - Present*, CDC WONDER, accessed November 2, 2023, https://wonder.cdc.gov/mcd-icd10-provisional.html. Data are compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Provisional data are available for years 2022 and later; final data are available for 2018-2021.

See S.L. Murphy et al., "Deaths: Final Data for 2018," *National Vital Statistics Reports*, vol. 69, no. 13 (Hyattsville, Md.: National Center for Health Statistics, 2020).

See J.Q. Xu et al., "Deaths: Final Data for 2019," *National Vital Statistics Reports*; vol. 70, no. 08 (Hyattsville, Md.: National Center for Health Statistics, 2021).

obtained the natality file data and used the CDC births report when the data were not available on WONDER to identify the number of live births, and used this to calculate the mortality rate—the number of deaths per 100,000 live births.[3] We analyzed mortality data starting in 2018, because of changes in data collection and coding for maternal deaths that were revised as of 2018 through 2022, the most recent full year of data.[4] We analyzed these data by the women's race and ethnicity and age to calculate the number and rate of deaths for each group and year.[5]

We also analyzed the natality data, which are based on birth certificate data, to identify the total number of live births and to calculate the percentage of births with selected characteristics. First, we examined the month prenatal care was initiated to calculate the percentage of births for which the mother initiated prenatal care in the first trimester, second trimester, or that had late or no prenatal care. We also examined Adequacy of Prenatal Care Utilization Index, a measure that CDC reports, to calculate the percentage of births for which the mother initiated prenatal care in the first 4 months of pregnancy, and attended at least 80 percent of the number of prenatal visits recommended by the American College of Obstetricians and Gynecologists, adjusted for gestational age.[6] Additionally, we used the location of birth to calculate the percentage of births occurring in hospitals or birthing facilities, free standing birth centers, clinics or doctors' offices, at home, or somewhere else. We used

See K.D. Kochanek et al., "Deaths: Final Data for 2020," *National Vital Statistics Reports*, vol. 72, no. 10 (Hyattsville, Md.: National Center for Health Statistics, 2023).

[3]See B.E. Hamilton, J.A. Martin, and M. Osterman, *Births: Provisional Data for 2022*, Vital Statistics Rapid Release, no. 28 (Hyattsville, Md.: National Center for Health Statistics, June 2023).

[4]The 2022 mortality data were accessed on July 12, 2023; these data are provisional and subject to change. Provisional data provide an early estimate of deaths before the release of final data that are fully reviewed by CDC. Maternal death counts may be revised when updates to death certificates are received from jurisdictions and when data are reviewed for coding and accuracy. Final mortality data for a given year are typically released 11 months after the end of the calendar year.

[5]We did not analyze maternal deaths by insurance type, because insurance information cannot be obtained solely using the CDC vital statistics death data.

[6]The Adequacy of Prenatal Care Utilization Index defines this as "adequate" care. Additionally, attending at least 110 percent of the recommended number of visits is considered "adequate-plus." We combined these groups to calculate the percentage of women who attended at least 80 percent of the recommended visits, which is inclusive of those who attended 110 percent or more, and refer to this as the "recommended number of visits."

the method of delivery to calculate the percentage of births that had a vaginal or cesarean delivery.[7]

We analyzed birth data from 2016, because of changes in coding of race as of 2016, through 2021, the most recent year of final data at the time of our analysis. For each year, we calculated the percentage of births with selected characteristics by racial and ethnic group, age, and primary payer for the delivery. [8]

In addition, we analyzed the vital statistics data to determine statistical significance at the 95 percent level.[9] The counts, percentages, and rates from the vital statistics data are not subject to sampling error, but may be affected by random variation. We calculated the 95 percent confidence intervals for these data to quantify the random variation. If the confidence intervals do not overlap, then the difference between the estimates is statistically significant at the 95 percent confidence level. For the death data, the confidence intervals do overlap, then we calculated the z-score; $z <= 1.96$ suggests that the difference between those estimates is statistically significant. We tested counts and rates based on fewer than 100 deaths using the confidence interval overlap method.

Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project. We reviewed data provided by the Agency for Healthcare Research and Quality from the Healthcare Cost and Utilization Project on national weighted counts of deliveries, national weighted counts, and estimated rates (per 10,000 deliveries) of deliveries with severe maternal morbidity, a COVID-19 diagnosis, or both. These data are from the National Inpatient Sample, a database that contains a stratified sample of inpatient discharge records representing approximately 20 percent of all community hospital discharges (excluding rehabilitation and long-term care) in the U.S. through state data

[7]According to CDC, cesarean delivery is associated with an increased risk of maternal morbidity. CDC has monitored this measure during the COVID-19 pandemic, among others, because the agency said it may be relevant to direct and indirect impacts of COVID-19.

[8]The payer in this data source is the primary source of payment for the delivery at the time of delivery.

[9]Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between estimated values being due to chance alone.

partnerships with the agency.[10] The data include the diagnosis and procedure codes defined by *the International Classification of Diseases, 10th Revision, Clinical Modification/Procedure Coding System* that appear on the inpatient discharge record, among other things.

According to the Agency for Healthcare Research and Quality, deliveries are identified from inpatient discharge records for females aged 12 to 55 years, with any delivery diagnoses, procedure, or diagnoses-related group, excluding abortion. Deliveries with severe maternal morbidity are identified through diagnoses or procedure codes for 20 of the 21 indicators defined by CDC and described in table 10; the data we reviewed exclude cases where blood transfusions are the sole indicator, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to HHS. We also reviewed data on deliveries with a diagnosis for COVID-19 or pneumonia due to COVID-19, based on codes J12.82 or U07.1 of *the International Classification of Diseases, 10th Revision, Clinical Modification/Procedure Coding System* for 2020.

Table 10: List of Severe Maternal Morbidity Indicators

Severe maternal morbidity indicator	Definition
Acute myocardial infarction	A heart attack or acute myocardial infarction occurs when one of the arteries that supplies the heart muscle becomes blocked.
Acute renal failure	Acute renal failure is the rapid loss of the kidneys' ability to remove waste and help balance fluids and electrolytes in the body. Acute kidney damage can be caused by pregnancy complications like placenta abruption or placenta previa.
Adult respiratory distress syndrome	Acute respiratory distress syndrome in adults is a life-threatening lung condition that prevents enough oxygen from getting to the lungs and into the blood.
Air and thrombotic embolism	An air and thrombotic embolism occurs when an air bubble enters and travels through the bloodstream, causing a blockage of an artery.
Amniotic fluid embolism	An amniotic fluid embolism occurs when amniotic fluid enters the bloodstream, and can cause organ dysfunction, excessive bleeding, and cardiovascular collapse.
Aneurysm	An aneurysm is a bulge or "ballooning" in the wall of an artery.
Blood products transfusiona	Blood products transfusion includes transfusion of whole blood or parts of blood, like red blood cells, platelets, or plasma. During delivery, a transfusion may be necessary in a variety of cases and may co-occur with another indicator of severe maternal morbidity.
Cardiac arrest/ventricular fibrillation	Ventricular fibrillation is a severely abnormal heart rhythm (also known as arrhythmia) that is life threatening. During ventricular fibrillation, blood is not pumped from the heart.

[10]For a list of states that partner with Agency for Healthcare Research and Quality on the Healthcare Cost and Utilization Project by year, see https://hcup-us.ahrq.gov/db/availability_public.jsp.

Severe maternal morbidity indicator	Definition
Conversion of cardiac rhythm	Cardioversion is a method to bring an abnormal heart rhythm back to normal. Cardioversion can be done using an electric shock or with drugs.
Disseminated intravascular coagulation	Disseminated intravascular coagulation is a disorder in which proteins that control blood clotting become overactive. Risk factors include pregnancy complications, such as placenta left behind after delivery.
Eclampsia	Eclampsia is the new onset of seizures or coma in a pregnant person with preeclampsia, a complication of pregnancy in which a person has high blood pressure and other findings, including headaches, abdominal pain, and abnormal blood tests. These seizures are not related to an existing brain condition.
Heart failure/arrest during surgery or procedure	Heart failure occurs when the heart is not able to pump enough oxygen-rich blood to the rest of the body efficiently, and heart arrest occurs when the heart suddenly stops beating and blood flow to the rest of the body, including the brain, stops.
Hysterectomy	Hysterectomy is surgery to remove a person's womb. During childbirth, uncontrolled bleeding can necessitate the procedure.
Puerperal cerebrovascular disorders	Suffering a cerebrovascular disorder, or having a stroke, occurs when blood flow to a part of the brain stops. A puerperal stroke occurs in the 6 weeks after delivery.
Pulmonary edema/acute heart failure	A pulmonary edema is an abnormal buildup of fluid in the lungs. It is often caused by congestive heart failure and causes shortness of breath.
Sepsis	Sepsis is an illness in which the body has a severe, inflammatory response to bacteria or other germs.
Severe anesthesia complications	Severe complications from spinal and epidural anesthesia include complications in the cardiac, pulmonary, and central nervous systems.
Shock	Shock is a life-threatening condition that occurs when the body is not getting enough blood flow to provide needed oxygen and nutrients to cells and organs.
Sickle cell disease with crisis	Sickle cell disease occurs when the red blood cells that carry oxygen throughout the body take on a sickle shape. The disease causes painful crises that can last from hours to days and cause pain in the lower back, leg, joints, and chest.
Temporary tracheostomy	A tracheostomy is a procedure to create an opening through the neck into the trachea to place a tube for use as an airway and to remove secretions from the lungs.
Ventilation	A ventilator is a machine that breathes for a person through a breathing tube that is placed in the mouth or in an opening through the neck into the trachea.

Source: Centers for Disease Control and Prevention and National Library of Medicine. | GAO-24-106271

[a]The data we reviewed excluded cases where blood transfusions are the sole indicator, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services.

We reviewed these data from 2016, the first full year of data using revised diagnoses and procedure codes, through 2020, the most recent year of complete national estimates at the time of our analysis.[11] We reviewed estimates by the patient's race and ethnicity, age, and the expected payer

[11]The *International Classification of Diseases, Ninth Revision, Clinical Modification* was updated to the *International Classification of Diseases, 10th Revision, Clinical Modification/Procedure Coding System* in 2015.

for the delivery for each year.[12] In addition, we reviewed confidence intervals for these data to determine statistical significance at the 95 percent level.[13] The 95 percent confidence interval provides information on the relative precision of an estimated value. Non-overlap between two confidence intervals of estimated values suggests that the difference between those estimated values is statistically significant.

CDC's Pregnancy Risk Assessment Monitoring System. We reviewed aggregate data provided by CDC from the Pregnancy Risk Assessment Monitoring System surveys of women who recently had a live birth on respondents' behaviors, attitudes, and experiences before, during, and shortly after pregnancy.[14] Specifically, we reviewed the estimated percentage of respondents who reported having depression during pregnancy, having depressive symptoms after pregnancy, and attending a postpartum visit, which are included in the survey for all participating sites and jurisdictions. We also reviewed data from two additional questions that only certain states and jurisdictions included in their survey: reasons the respondent did not get prenatal care as early as they wanted, and reasons the respondent did not attend a postpartum visit.[15]

[12]Expected payer is the primary payer the hospital expects to pay the hospital bill, according to Agency for Healthcare Research and Quality documentation; however, agency officials noted that the actual payer for the bill could be different.

[13]Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between estimated values being due to chance alone.

[14]Responses to the core survey are obtained from an annual sample of 1,000 to 3,000 women per participating state or jurisdiction, such as Washington, D.C., and New York City, who recently had a live birth. Following CDC guidance, we excluded responses that had fewer than 60 respondents from our tables and analysis, because they may not be reliable, according to CDC. Additionally, responses that had fewer than 30 respondents were suppressed in the data we received from CDC. Data suppression is when a record or certain parts of a record are not included in the published data to ensure that data cannot be re-identified.

[15]Participating states and jurisdictions may choose to include additional questions in their survey from CDC or that they develop. The prenatal care question was asked by the following states and jurisdictions, and included in the aggregate data for years in which the state met the 50 percent response threshold: Alabama, Alaska, Connecticut, Delaware, Florida, Illinois, Indiana, Kansas, Louisiana, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New Mexico, North Carolina, North Dakota, Pennsylvania, South Dakota, Tennessee, Texas, Virginia, Washington, D.C., and Wisconsin. The postpartum visit question was asked by the following states and included in the aggregate data for years in which the state met the 50 percent response threshold: Arizona, Illinois, Iowa, Maryland, Utah, Virginia, and Wisconsin. For a list of states and jurisdictions that met the reporting threshold, see table 11.

CDC also develops supplemental questions to collect data on emerging concerns, such as the COVID-19 pandemic, that participating states and jurisdictions may choose to add to their questionnaire. We reviewed the estimated percentage of respondents who, during the pandemic, reported feeling more depressed or anxious had prenatal care delayed or canceled, had or did not have virtual prenatal and postpartum visits, reported certain reasons for not attending a virtual visit, and had certain people with them at delivery.

We reviewed these data by the respondent's race and ethnicity, age, and the insurance they reported having during pregnancy for prenatal care or after pregnancy. In addition, we reviewed confidence intervals for these data to determine statistical significance at the 95 percent level.[16] The 95 percent confidence interval provides information on the relative precision of an estimated value. Non-overlap between two confidence intervals of estimated values suggests that the difference between those estimated values is statistically significant.

We reviewed these data for each year from 2018, the year CDC revised the response threshold for a state or jurisdiction to be included in the aggregate data to 50 percent, through 2021, the most recent year of available data at the time of our analysis. For the supplemental Maternal COVID-19 Experiences questionnaire, we reviewed aggregate data from all participating sites and jurisdictions, regardless of whether they met the 50 percent response threshold, for 2020 and 2021.[17] The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. (See table 11.)

[16]Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between estimated values being due to chance alone.

[17]According to CDC officials, they included data from all sites and jurisdictions using the supplemental Maternal COVID-19 Experiences questionnaire in order to make use of all available data to inform the agency's emergency response to the pandemic.

Table 11: States and Jurisdictions Included in Aggregate Pregnancy Risk Assessment Monitoring System Data by Year and Questionnaire

Year	States and jurisdictions meeting 50 percent response threshold for core questionnaire	States and jurisdictions using supplemental Maternal COVID-19 Experiences questionnaire
2018	Alabama, Alaska, Arkansas, Colorado, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York City, New York State, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Puerto Rico, Rhode Island, South Dakota, Utah, Vermont, Virginia, Washington, Washington, D.C., West Virginia, Wisconsin, Wyoming	na
2019	Alabama, Alaska, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York City, New York State, North Carolina, North Dakota, Oregon, Pennsylvania, Puerto Rico, Rhode Island, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, Washington, D.C., Wisconsin, Wyoming	na
2020	Alabama, Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York City, North Dakota, Oregon, Pennsylvania, Puerto Rico, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, Washington, D.C., West Virginia, Wisconsin, Wyoming	Alaska, Arizona, Arkansas, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Louisiana, Maryland, Massachusetts, Michigan, Missouri, Nebraska, Nevada, New Jersey, New York, New York City , North Carolina, North Dakota, Oregon, Pennsylvania, Puerto Rico, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, D.C., West Virginia, Wyoming.[a]
2021	Alabama, Arkansas, Colorado, Connecticut, Delaware, Georgia, Hawaii, Illinois, Kansas, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, New Mexico, New York City, New York State, North Dakota, Oklahoma, Oregon, Pennsylvania, Puerto Rico, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, Washington, D.C., West Virginia, Wisconsin, Wyoming	Arizona, Georgia, Indiana, Massachusetts, Maryland, North Dakota, Nebraska, New Jersey, Nevada, New York, New York City, Oregon, Puerto Rico, South Carolina, South Dakota, Tennessee, Utah, Virginia, Vermont, Washington, D.C., West Virginia, Wyoming.[b]

Source: Centers for Disease Control and Prevention documentation and written responses from agency officials. | GAO-24-106271

[a]The states that did not meet the 50 percent response rate threshold were Indiana, Nevada, New York, North Carolina, and South Carolina.

[b]The states that did not meet the 50 percent response rate threshold were Arizona, Indiana, Maryland, Nevada, and South Carolina.

Appendix II: Additional Data on Maternal Health Outcomes

This appendix provides additional information on maternal health outcomes, based on our analysis of the Department of Health and Human Services (HHS) data. Specifically, this appendix provides data on

- maternal mortality;
- deliveries with severe maternal morbidity and COVID-19 diagnosis;
- maternal mental health, including anxiety or depression due to the pandemic;
- prenatal care timing and use, including attending virtual visits;
- delivery, including location and method; and
- postpartum care use, including reasons for not attending a postpartum visit and attending virtual visits.

To the extent possible, we present this information by race and ethnicity, primary or expected payer for the delivery or insurance, and age group. In some cases, certain groups are too small to be reported separately (i.e., data are suppressed), and are combined or excluded.[1] This information is noted throughout this appendix. Additionally, because the states and jurisdictions included in the Pregnancy Risk Assessment Monitoring System data we reviewed varied from year to year, estimates are not directly comparable across years in tables 21-24, 28-34, and 41-48.

Table 12: Counts of Maternal Deaths, 2018—2022

na	na	2018 (confidence interval)	2019 (confidence interval)	2020 (confidence interval)	2021 (confidence interval)	2022[a] (confidence interval)
na	Total maternal deaths	658 (608, 708)	754 (700, 808)	861 (803, 919)	1,205 (1,137, 1,273)	817 (761, 873)
Race and ethnicity	Not Hispanic or Latina	na	na	na	na	na

[1]Data suppression is when a record or certain parts of a record are not included in the published data to ensure that data cannot be re-identified.

na	na	2018 (confidence interval)	2019 (confidence interval)	2020 (confidence interval)	2021 (confidence interval)	2022[a] (confidence interval)
Race and ethnicity	American Indian or Alaska Native	9 (4, 17)	14 (8, 23)	13 (7, 22)	31 (21, 44)	13 (7, 22)
Race and ethnicity	Asian	32 (22, 45)	33 (23, 46)	27 (18, 39)	36 (25, 50)	29 (19, 42)
Race and ethnicity	Black or African American	206 (178, 234)	241 (211, 271)	293 (259, 327)	362 (325, 399)	247 (216, 278)
Race and ethnicity	Native Hawaiian or Other Pacific Islander	4 (1, 10)	5 (2, 12)	4 (1, 10)		
Race and ethnicity	White	291 (258, 324)	343 (307, 379)	352 (315, 389)	503 (459, 547)	355 (318, 392)
Race and ethnicity	More than one race	10 (5, 18)		14 (8, 23)	19 (11, 30)	
Race and ethnicity	Hispanic or Latina[b]	105 (85, 125)	112 (91, 133)	158 (133, 183)	248 (217, 279)	158 (133, 183)
Age	Under 20 years old	21 (13, 32)	21 (13, 32)	27 (18, 39)	30 (20, 43)	26 (17, 38)
Age	20-24 years old	75 (59, 94)	90 (72, 111)	87 (70, 107)	133 (110, 156)	86 (69, 106)
Age	25-34 years old	278 (245, 311)	363 (326, 400)	416 (376, 456)	557 (511, 603)	364 (327, 401)
Age	35 years old and up	284 (251, 317)	279 (246, 312)	331 (295, 367)	485 (442, 528)	341 (305, 377)

"—" indicates that data were not available.

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Note: According to the World Health Organization, a maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Maternal deaths are assigned to code numbers A34, O00–O95, and O98–O99 of the *International Classification of Disease, 10th Revision.*

The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone.

[a]The 2022 data were accessed on July 12, 2023; these data are provisional and subject to change.

[b]Hispanic or Latina women may be of any race.

Table 13: Maternal Mortality Rates, 2018—2022

na	na	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)	2022a (confidence intervals)
na	Total maternal mortality rate	17.4 (16.0, 18.7)	20.1 (18.7, 21.6)	23.8 (22.2, 25.4)	32.9 (31.0, 34.7)	22.3 (20.8, 23.8)
Race and ethnicity	Not Hispanic or Latina	na	na	na	na	na
Race and ethnicity	American Indian or Alaska Native	30.9b (14.1, 58.7)	49.2 (26.9, 82.6)	48.5 (25.8, 82.9)	118.7 (80.6, 168.4)	51.2 (27.3, 87.6)

na	na	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)	2022a (confidence intervals)
Race and ethnicity	Asian	13.3 (9.1, 18.8)	13.8 (9.5, 19.4)	12.3 (8.1, 17.9)	16.8 (11.8, 23.3)	13.3 (8.9, 19.0)
Race and ethnicity	Black or African American	37.3 (32.2, 42.4)	44.0 (38.4, 49.5)	55.3 (49.0, 61.6)	69.9 (62.7, 77.1)	48.4 (42.4, 54.4)
Race and ethnicity	Native Hawaiian or Other Pacific Islander	42.2 (11.5, 108.1)	51.2 (16.6, 119.4)	41.6 (11.3, 106.4)	na	na
Race and ethnicity	White	14.9 (13.2, 16.6)	17.9 (16.0, 19.8)	19.1 (17.1, 21.1)	26.6 (24.3, 29.0)	19.4 (17.4, 21.4)
Race and ethnicity	More than one race	11.9 (5.7, 21.9)	na	16.6 (9.1, 27.9)	21.8 (13.2, 34.1)	na
Race and ethnicity	Hispanic or Latinac	11.8 (9.6, 14.1)	12.6 (10.3, 15.0)	18.2 (15.4, 21.1)	28.0 (24.5, 31.5)	16.9 (14.3, 19.5)
Age	Under 20 years old	11.6 (7.2, 17.7)	12.1 (7.5, 18.5)	16.9 (11.1, 24.6)	20.2 (13.6, 28.8)	17.9 (11.7, 26.2)
Age	20-24 years old	10.3 (8.1, 12.9)	12.8 (10.3, 15.7)	13.1 (10.5, 16.1)	20.5 (17.0, 24.0)	13.5 (10.8, 16.7)
Age	25-34 years old	12.7 (11.2, 14.2)	16.7 (15.0, 18.5)	19.9 (18.0, 21.8)	26.0 (23.9, 28.2)	17.1 (15.3, 18.9)
Age	35 years old and up	40.9 (36.2, 45.7)	39.7 (35.1, 44.4)	47.7 (42.6, 52.8)	66.6 (60.7, 72.6)	45.5 (40.6, 50.3)

"—" indicates that data were not available.

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Notes: According to the World Health Organization, a maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Maternal deaths are assigned to code numbers A34, O00–O95, and O98–O99 of the *International Classification of Disease, 10th Revision.* Maternal mortality rate is the number of maternal deaths per 100,000 live births.

The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone.

[a]The 2022 data were accessed on July 12, 2023; these data are provisional and subject to change.

[b]The maternal mortality rate for American Indian or Alaska Native women in 2018 is based on fewer than 20 deaths and should be interpreted with caution.

[c]Hispanic or Latina women may be of any race.

Table 14: Weighted Counts of In-Hospital Deliveries with Severe Maternal Morbidity, 2016—2020

na	na	2016 (standard error)	2017 (standard error)	2018 (standard error)	2019 (standard error)	2020 (standard error)
na	All deliveries with severe maternal morbidity	27,260 (731)	26,495 (703)	27,860 (756)	28,570 (811)	30,445 (849)
Race and ethnicity	Not Hispanic or Latina	na	na	na	na	na

na	na	2016 (standard error)	2017 (standard error)	2018 (standard error)	2019 (standard error)	2020 (standard error)
Race and ethnicity	Asian/Pacific Islander	1,710 (155)	1,630 (128)	1,860 (155)	1,905 (148)	1,965 (144)
Race and ethnicity	Black or African American	5,855 (300)	6,150 (297)	6,210 (294)	6,465 (308)	6,895 (356)
Race and ethnicity	White	11,705 (365)	10,490 (339)	11,690 (378)	11,870 (382)	12,390 (396)
Race and ethnicity	All other races[a]	1,405 (136)	1,555 (117)	1,565 (115)	1,580 (119)	1,645 (108)
Race and ethnicity	Hispanic or Latina[b]	5,235 (281)	5,475 (263)	5,760 (281)	5,875 (302)	6,725 (320)
Expected payer[c]	Private insurance	12,250 (403)	11,950 (424)	12,580 (446)	13,335 (468)	13,915 (473)
Expected payer[c]	Medicaid	13,095 (453)	12,710 (408)	13,265 (434)	13,255 (461)	14,420 (511)
Expected payer[c]	Other[d]	1,260 (97)	1,250 (97)	1,225 (97)	1,210 (94)	1,275 (98)
Expected payer[c]	Self-pay or no charge[e]	635 (59)	545 (60)	740 (71)	740 (71)	775 (75)
Age	Under 20 years old	1,350 (91)	1,370 (86)	1,330 (85)	1,475 (97)	1,280 (87)
Age	20-24 years old	4,550 (188)	4,365 (181)	4,150 (173)	4,270 (178)	4,590 (188)
Age	25-34 years old	14,445 (430)	13,860 (425)	14,760 (442)	14,990 (481)	15,935 (476)
Age	35 years old and up	6,915 (257)	6,900 (261)	7,620 (281)	7,835 (301)	8,640 (323)

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample 2016-2020. | GAO-24-106271

Notes: Severe maternal morbidity is an unexpected adverse outcome of labor and delivery that results in significant short- or long-term health consequences. These data reflect national estimates based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years where a procedure or diagnosis code indicating severe maternal morbidity appears on the discharge record. These data exclude cases where blood transfusions are the sole indicator of severe maternal morbidity, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. Totals may not add across groups due to missing observations for race and ethnicity and expected payer. The standard errors are noted in parenthesis and are a measure of the precision of a statistic. Less precise estimates have larger standard errors, while more precise estimates have smaller standard errors.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those who reported “other” as their race.

[b]Hispanic or Latina women may be of any race.

[c]Expected payer is the primary payer the hospital expects to pay the hospital bill, according to Agency for Healthcare Research and Quality documentation.

[d]Other payers in this data source include other government payers, such as the Indian Health Service and military health care coverage.

[e]The self-pay or no charge category in this data source includes those who self-pay, have no charge or expected payment, or receive charity care, and may include other payers such as government programs for the indigent.

Table 15: Estimated Rate of Severe Maternal Morbidity among In-Hospital Deliveries, 2016—2020

na	na	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)
na	Estimated rate of all deliveries with severe maternal morbidity	72.0 (69.2, 74.9)	71.5 (68.7, 74.4)	76.7 (73.6, 79.7)	79.7 (76.4, 83.0)	88.2 (84.4, 91.9)
Race and ethnicity	Not Hispanic or Latina	na	na	na	na	na
Race and ethnicity	Asian/Pacific Islander	76.6 (66.3, 86.9)	72.7 (63.1, 82.3)	85.3 (75.0, 95.6)	88.5 (77.8, 99.2)	98.1 (86.7, 109.4)
Race and ethnicity	Black or African American	111.1 (103.0, 119.3)	114.4 (106.4, 122.5)	118.8 (110.8, 126.8)	122.3 (114.1, 130.6)	135.2 (125.3, 145.0)
Race and ethnicity	White	62.0 (58.9, 65.0)	57.0 (54.1, 59.9)	63.2 (60.0, 66.5)	65.0 (61.8, 68.2)	70.9 (67.3, 74.6)
Race and ethnicity	All other races[a]	73.7 (62.7, 84.6)	80.7 (70.6, 90.9)	81.7 (71.5, 91.9)	88.1 (76.8, 99.5)	95.7 (84.9, 106.5)
Race and ethnicity	Hispanic or Latina[b]	71.4 (66.0, 76.7)	75.0 (69.7, 80.3)	78.5 (73.0, 83.9)	81.3 (75.3, 87.3)	94.3 (87.6, 100.9)
Expected payer[c]	Private insurance	63.7 (60.6, 66.7)	63.5 (60.2, 66.9)	67.3 (63.8, 70.8)	71.5 (67.8, 75.2)	76.8 (72.9, 80.7)
Expected payer[c]	Medicaid	80.7 (76.6, 84.8)	79.4 (75.5, 83.2)	86.0 (81.8, 90.1)	89.0 (84.5, 93.6)	100.1 (94.8, 105.4)
Expected payer[c]	Other[d]	90.6 (77.7, 103.5)	102.9 (88.1, 117.8)	101.8 (86.8, 116.8)	98.7 (85.1, 112.3)	109.6 (95.0, 124.2)
Expected payer[c]	Self-pay or no charge[e]	67.6 (55.9, 79.3)	57.9 (46.5, 69.4)	75.7 (62.9, 88.5)	71.4 (59.1, 83.7)	94.3 (78.5, 110.0)
Age	Under 20 years old	64.5 (56.6, 72.4)	71.0 (62.5, 79.6)	75.0 (66.1 ,84.0)	87.1 (76.5, 97.6)	82.0 (71.5, 92.4)
Age	20-24 years old	58.9 (54.6, 63.2)	59.6 (55.2, 64.0)	59.4 (55.0, 63.9)	63.3 (58.6, 68.1)	72.1 (66.9, 77.3)
Age	25-34 years old	66.8 (63.7, 70.0)	65.1 (61.8, 68.4)	70.5 (67.1, 73.8)	72.4 (68.7, 76.1)	79.8 (76.0, 83.6)
Age	35 years and older	107.9 (101.6, 114.3)	106.2 (99.8, 112.5)	114.7 (108.1, 121.4)	117.3 (110.4, 124.2)	130.3 (122.1, 138.4)

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample 2016-2020. | GAO-24-106271

Notes: Severe maternal morbidity is an unexpected adverse outcome of labor and delivery that results in significant short- or long-term health consequences. These data reflect national estimates based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years where a procedure or diagnosis code indicating severe maternal morbidity appears on the discharge record. These data exclude cases where blood transfusions are the sole indicator of severe maternal morbidity, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. The estimated severe maternal morbidity rate is the weighted count of deliveries with a severe maternal morbidity indicator per 10,000 deliveries.The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race.

[b]Hispanic or Latina women may be of any race.

[c]Expected payer is the primary payer the hospital expects to pay the hospital bill, according to Agency for Healthcare Research and Quality documentation.

[d]Other payers in this data source include other government payers, such as the Indian Health Service and military health care coverage.

[e]The self-pay or no charge category in this data source includes those who self-pay, have no charge or expected payment, or receive charity care, and may include other payers such as government programs for the indigent.

Table 16: Estimated Rate of Severe Maternal Morbidity among In-Hospital Deliveries by Indicator, 2016—2020

Severe maternal morbidity indicator	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)
Disseminated intravascular coagulation	19.8 (18.5, 21.2)	20.3 (18.9, 21.7)	20.9 (19.5, 22.3)	21.2 (19.7, 22.7)	22.2 (20.6, 23.9)
Acute renal failure	10.3 (9.4, 11.3)	11.5 (10.5, 12.4)	13.0 (12.0, 14.1)	15.3 (14.0, 16.5)	19.1 (17.5, 20.7)
Adult respiratory distress syndrome	8.7 (8.0, 9.5)	9.2 (8.4, 10.0)	10.2 (9.5, 11.0)	10.1 (9.4, 10.9)	14.3 (13.3, 15.3)
Sepsis	9.0 (8.2, 9.9)	9.4 (8.4, 10.3)	10.6 (9.3, 11.8)	11.1 (9.8, 12.4)	12.9 (11.6, 14.1)
Hysterectomy	11.6 (10.7, 12.6)	11.6 (10.7, 12.6)	12.7 (11.7, 13.7)	12.5 (11.6, 13.5)	12.3 (11.2, 13.3)
Acute heart failure/pulmonary edema	6.1 (5.5, 6.7)	6.2 (5.6, 6.8)	6.6 (6.0, 7.3)	7.3 (6.6, 8.0)	7.6 (6.9, 8.3)
Eclampsia	10.4 (9.5, 11.2)	7.9 (7.2 ,8.7)	7.0 (6.3, 7.6)	6.9 (6.3, 7.6)	7.4 (6.7, 8.1)
Shock	5.7 (5.1, 6.2)	5.5 (5.0, 6.1)	6.8 (6.2, 7.5)	6.9 (6.3, 7.6)	7.3 (6.6, 7.9)
Ventilation	4.9 (4.4, 5.4)	4.8 (4.3, 5.4)	5.2 (4.7, 5.8)	4.7 (4.2, 5.3)	6.0 (5.3, 6.6)
Puerperal cerebrovascular disorder	2.9 (2.5, 3.3)	2.8 (2.4, 3.2)	3.4 (3.0, 3.8)	3.5 (3.1, 3.9)	3.8 (3.3, 4.3)
Air and thrombotic embolism	3.1 (2.7, 3.6)	3.0 (2.6, 3.4)	3.6 (3.2, 4.1)	3.0 (2.6, 3.4)	3.2 (2.8, 3.7)
Sickle cell disease with crisis	1.2 (0.9, 1.5)	1.3 (1.0, 1.6)	1.3 (1.0, 1.6)	1.1 (0.9, 1.4)	1.2 (0.9, 1.5)
Conversion of cardiac rhythm	0.8 (0.6, 1.0)	0.9 (0.6, 1.1)	0.9 (0.7, 1.2)	1.0 (0.8, 1.2)	1.1 (0.8, 1.3)
Cardiac arrest/ventricular fibrillation	0.9 (0.7, 1.2)	0.9 (0.7, 1.2)	1.2 (1.0, 1.5)	1.0 (0.8, 1.3)	1.0 (0.7, 1.2)
Acute myocardial infarction	0.4 (0.2, 0.5)	0.3 (0.2, 0.4)	0.4 (0.2, 0.5)	0.5 (0.3, 0.7)	0.7 (0.5, 0.9)
Amniotic fluid embolism	0.5 (0.4, 0.7)	0.6 (0.4, 0.8)	0.6 (0.4, 0.8)	0.6 (0.5, 0.8)	0.5 (0.3, 0.7)
Severe anesthesia complication	0.8 (0.6, 1.0)	0.6 (0.4, 0.8)	0.7 (0.5, 0.9)	0.8 (0.6, 1.0)	0.4 (0.2, 0.5)
Aneurysm	0.2 (0.1, 0.4)	0.3 (0.2, 0.5)	0.4 (0.3, 0.6)	0.4 (0.2, 0.5)	0.4 (0.2, 0.5)
Temporary tracheostomy	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)	0.2 (0.1, 0.4)	0.3 (0.2, 0.5)
Heart failure/arrest during surgery or procedure	0.1 (0.1, 0.2)	0.1 (0.0, 0.2)	0.1 (0.1, 0.2)	0.1 (0.0, 0.1)	0.1 (0.0, 0.2)

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample 2016-2020. | GAO-24-106271

Notes: Severe maternal morbidity is an unexpected adverse outcome of labor and delivery that results in significant short- or long-term health consequences. These data reflect national estimates

based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years where a procedure or diagnosis code indicating severe maternal morbidity appears on the discharge record. These data exclude cases where blood transfusions are the sole indicator of severe maternal morbidity, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. The estimated severe maternal morbidity rate is the weighted count of deliveries with a severe maternal morbidity indicator per 10,000 deliveries. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

Table 17: Estimated Rate of 10 Most Common Severe Maternal Morbidity Indicators among In-Hospital Deliveries with and without COVID-19 Diagnosis, 2020

Severe maternal morbidity indicator	Estimated rate with COVID-19 diagnosis (confidence intervals)	Estimated rate without COVID-19 diagnosis (confidence intervals)
Any severe maternal morbidity	442.1 (397.0, 487.2)	83.3 (79.8, 86.9)
Disseminated intravascular coagulation	61.6 (42.5, 80.8)	21.7 (20.1, 23.3)
Acute renal failure	54.0 (38.7, 69.4)	18.6 (17.1, 20.2)
Adult respiratory distress syndrome	310.2 (272.4, 348.1)	10.3 (9.5, 11.1)
Sepsis	113.5 (91.6, 135.4)	11.5 (10.3, 12.7)
Hysterectomy	13.0 (5.8, 20.1)	12.3 (11.2, 13.3)
Acute heart failure/pulmonary edema	19.5 (10.1, 28.8)	7.4 (6.7, 8.1)
Eclampsia	16.2 (8.1, 24.4)	7.3 (6.6, 8.0)
Shock	20.5 (10.6, 30.5)	7.1 (6.4, 7.7)
Ventilation	113.5 (91.9, 135.1)	4.5 (4.0, 5.0)
Puerperal cerebrovascular disorder	8.6 (2.6, 14.7)	3.8 (3.2, 4.3)

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample 2020. | GAO-24-106271

Notes: Severe maternal morbidity is an unexpected adverse outcome of labor and delivery that results in significant short- or long-term health consequences. These data reflect national estimates based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years where a procedure or diagnosis code indicating severe maternal morbidity appears on the discharge record. These data exclude cases where blood transfusions are the sole indicator of severe maternal morbidity, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. The estimated severe maternal morbidity rate is the weighted count of deliveries with a severe maternal morbidity indicator per 10,000 deliveries. COVID-19 diagnoses are reported starting in April 2020. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

Table 18: Estimated Rate of In-Hospital Deliveries with COVID-19 Diagnosis, 2020

na	na	Estimated Rate of COVID-19 diagnosis per 10,000 deliveries (confidence intervals)
na	All deliveries	133.9 (126.0, 141.9)
Race and ethnicity	Not Hispanic or Latina	na
Race and ethnicity	Asian/Pacific Islander	81.9 (68.8, 94.9)

na	na	Estimated Rate of COVID-19 diagnosis per 10,000 deliveries (confidence intervals)
Race and ethnicity	Black or African American	153.2 (139.0, 167.4)
Race and ethnicity	White	74.6 (69.1, 80.1)
Race and ethnicity	All other races[a]	187.6 (156.9, 218.2)
Race and ethnicity	Hispanic or Latina[b]	270.1 (245.5, 294.8)
Expected payer[c]	Private insurance	87.3 (81.3, 93.4)
Expected payer[c]	Medicaid	189.4 (175.5, 203.2)
Expected payer[c]	Other[d]	110.0 (93.0, 127.0)
Expected payer[c]	Self-pay or no charge[e]	222.0 (182.9, 261.0)
Age	Under 20 years old	201.7 (181.0, 222.4)
Age	20-24 years old	168.6 (156.2, 180.9)
Age	25-34 years old	123.7 (116.1, 131.3)
Age	35 years old and up	115.4 (106.6, 124.3)

Source: GAO analysis of Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample 2020. | GAO-24-106271

Notes: These data reflect national estimates based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years with a COVID-19 diagnosis on the discharge record. COVID-19 diagnosis is reported starting in April 2020. Totals may not add across groups due to missing observations for race and ethnicity and expected payer. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. Hispanic or Latina women may be of any race.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race.

[b]Hispanic or Latina women may be of any race.

[c]Expected payer is the primary payer the hospital expects to pay the hospital bill, according to Agency for Healthcare Research and Quality documentation.

[d]Other payers in this data source include other government payers, such as the Indian Health Service and military health care coverage.

[e]The self-pay or no charge category in this data source includes those who self-pay, have no charge or expected payment, or receive charity care, and may include other payers such as government programs for the indigent.

Table 19: Estimated Rate of 10 Most Common Severe Maternal Morbidity Indicators among In-Hospital Deliveries by Race and Ethnicity, 2016—2020

Severe maternal morbidity indicator	Race and ethnicity	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)
Disseminated intravascular coagulation	Not Hispanic or Latina	na	na	na	na	na
Disseminated intravascular coagulation	Asian/Pacific Islander	27.6 (21.7, 33.4)	25.2 (20.1, 30.3)	29.1 (23.7, 34.5)	27.4 (22.1, 32.7)	31.9 (25.4, 38.5)

Severe maternal morbidity indicator	Race and ethnicity	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)
Disseminated intravascular coagulation	Black or African American	22.8 (19.5, 26.1)	26.1 (22.7, 29.4)	26.1 (22.8, 29.5)	28.2 (24.7, 31.7)	26.3 (22.3, 30.2)
Disseminated intravascular coagulation	White	18.7 (17.1, 20.3)	17.9 (16.3, 19.5)	18.4 (16.7, 20.1)	18.3 (16.7, 19.9)	19.9 (18.2, 21.6)
Disseminated intravascular coagulation	All other races[a]	20.2 (15.0, 25.3)	24.7 (18.2, 31.2)	26.1 (19.5, 32.7)	21.5 (16.0, 27.0)	24.1 (18.5, 29.8)
Disseminated intravascular coagulation	Hispanic or Latina[b]	19.3 (16.1, 22.4)	20.6 (17.8, 23.4)	20.4 (17.7, 23.2)	21.0 (17.9, 24.0)	22.7 (19.2, 26.2)
Acute renal failure	Not Hispanic or Latina	na	na	na	na	na
Acute renal failure	Asian/Pacific Islander	8.1 (5.5, 10.6)	10.5 (7.5, 13.5)	14.9 (11.3, 18.5)	17.9 (13.6, 22.2)	15.2 (10.9, 19.6)
Acute renal failure	Black or African American	19.8 (16.7, 22.9)	23.2 (20.0, 26.3)	26.1 (22.6, 29.6)	29.9 (26.0, 33.8)	37.4 (32.6, 42.3)
Acute renal failure	White	7.8 (6.7, 8.8)	8.0 (6.9, 9.0)	9.6 (8.4, 10.7)	11.4 (10.1, 12.7)	15.0 (13.3, 16.7)
Acute renal failure	All other races[a]	11.8 (7.8, 15.8)	10.4 (6.9, 13.9)	16.7 (12.0, 21.4)	13.9 (10.0, 17.8)	20.4 (15.6, 25.1)
Acute renal failure	Hispanic or Latina[b]	9.6 (7.9, 11.3)	12.1 (10.3, 14.0)	11.1 (9.3, 12.9)	14.3 (12.2, 16.4)	16.6 (14.3, 19.0)
Adult respiratory distress syndrome	Not Hispanic or Latina	na	na	na	na	na
Adult respiratory distress syndrome	Asian/Pacific Islander	10.5 (7.6, 13.4)	9.6 (6.7, 12.5)	13.5 (10.1, 16.9)	11.6 (8.4, 14.8)	18.0 (13.7, 22.2)
Adult respiratory distress syndrome	Black or African American	15.8 (13.2, 18.5)	15.8 (13.4, 18.3)	16.5 (14.1, 18.9)	16.7 (14.3, 19.2)	22.6 (19.5, 25.8)
Adult respiratory distress syndrome	White	6.6 (5.8, 7.4)	7.2 (6.3, 8.1)	8.3 (7.3, 9.3)	8.2 (7.2, 9.2)	9.7 (8.5, 10.9)
Adult respiratory distress syndrome	All other races[a]	8.7 (5.8, 11.5)	10.1 (6.9, 13.3)	10.4 (7.3, 13.6)	11.7 (8.2, 15.2)	14.5 (10.4, 18.7)
Adult respiratory distress syndrome	Hispanic or Latina[b]	9.0 (7.4, 10.6)	9.1 (7.6, 10.6)	10.1 (8.4, 11.9)	9.6 (7.9, 11.3)	18.6 (16.2, 20.9)
Sepsis	Not Hispanic or Latina	na	na	na	na	na
Sepsis	Asian/Pacific Islander	14.3 (9.8, 18.9)	16.5 (11.6, 21.3)	18.1 (12.3, 23.9)	17.4 (12.2, 22.6)	23.7 (17.9, 29.5)
Sepsis	Black or African American	13.1 (10.8, 15.4)	12.9 (10.7, 15.2)	13.5 (11.0, 16.0)	16.3 (13.6, 19.0)	18.1 (15.4, 20.9)
Sepsis	White	6.9 (6.0, 7.8)	6.2 (5.3, 7.1)	7.9 (6.8, 9.1)	7.1 (6.0, 8.3)	8.0 (6.9, 9.0)

Severe maternal morbidity indicator	Race and ethnicity	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)
Sepsis	All other races[a]	8.7 (5.6, 11.7)	10.1 (7.0, 13.3)	8.4 (5.2, 11.5)	16.7 (11.4, 22.0)	15.4 (11.1, 19.7)
Sepsis	Hispanic or Latina[b]	10.7 (8.8, 12.6)	12.1 (10.0, 14.3)	13.6 (11.3, 15.8)	14.3 (12.1, 16.6	17.9 (15.3, 20.6)
Hysterectomy	Not Hispanic or Latina	na	na	na	na	na
Hysterectomy	Asian/Pacific Islander	17.5 (13.6, 21.4)	14.0 (10.6, 17.5)	14.0 (10.7, 17.3)	14.9 (11.3, 18.4)	16.0 (12.0, 19.9)
Hysterectomy	Black or African American	13.0 (10.8, 15.2)	15.5 (13.1, 18.0)	16.5 (13.8, 19.1)	16.7 (13.9, 19.4)	15.0 (12.4, 17.6)
Hysterectomy	White	9.9 (8.8, 11.0)	9.1 (8.1, 10.2)	10.0 (8.8, 11.2)	10.1 (9.0, 11.2)	10.4 (9.2, 11.7)
Hysterectomy	All other races[a]	12.1 (8.5, 15.6)	14.8 (10.7, 18.9)	14.6 (10.8, 18.5)	12.3 (8.8, 15.8)	11.6 (8.1, 15.2)
Hysterectomy	Hispanic or Latina[b]	14.0 (12.0, 16.1)	13.5 (11.5, 15.4)	16.1 (13.9, 18.4)	14.9 (12.6, 17.1)	14.1 (12.0, 16.2)
Acute heart failure/ pulmonary edema	Not Hispanic or Latina	na	na	na	na	na
Acute heart failure/ pulmonary edema	Asian/Pacific Islander	6.5 (3.7, 9.3)	8.7 (5.6, 11.8)	6.9 (4.2, 9.6)	8.6 (5.7, 11.5)	6.0 (3.6, 8.4)
Acute heart failure/ pulmonary edema	Black or African American	13.7 (11.3, 16.0)	12.5 (10.0, 14.9)	13.6 (11.2, 15.9)	14.1 (11.6, 16.6)	15.4 (12.8, 18.0)
Acute heart failure/ pulmonary edema	White	4.4 (3.8, 5.1)	4.7 (4.0, 5.4)	5.5 (4.7, 6.3)	6.0 (5.1, 6.9)	6.1 (5.3, 7.0)
Acute heart failure/ pulmonary edema	All other races[a]	7.3 (4.3, 10.4)	4.7 (2.6, 6.8)	6.5 (3.9, 9.1)	7.8 (5.0, 10.6)	7.3 (4.5, 10.0)
Acute heart failure/ pulmonary edema	Hispanic or Latina[b]	4.7 (3.6, 5.8)	5.3 (4.1, 6.4)	4.9 (3.7, 6.1)	4.7 (3.6, 5.8)	6.3 (5.0, 7.7)
Eclampsia	Not Hispanic or Latina	na	na	na	na	na
Eclampsia	Asian/Pacific Islander	5.6 (3.2, 8.0)	3.8 (1.8, 5.7)	4.1 (2.3, 6.0)	3.0 (1.3, 4.7)	3.0 (1.3, 4.7)
Eclampsia	Black or African American	17.8 (15.1, 20.6)	14.4 (11.9, 16.9)	12.3 (10.2, 14.5)	11.4 (9.2, 13.5)	14.2 (11.9, 16.6)
Eclampsia	White	9.0 (7.9, 10.1)	6.2 (5.4, 7.0)	5.8 (4.9, 6.6)	5.9 (5.0, 6.7)	5.3 (4.5, 6.1)
Eclampsia	All other races[a]	11.8 (8.4, 15.2)	9.6 (6.3, 12.9)	7.0 (4.5, 9.6)	8.9 (5.7, 12.1)	10.5 (6.9, 14.0)
Eclampsia	Hispanic or Latina[b]	10.0 (8.3, 11.6)	8.0 (6.5, 9.5)	7.2 (5.8, 8.6)	7.3 (6.0, 8.7)	8.8 (7.2, 10.5)
Shock	Not Hispanic or Latina	na	na	na	na	na
Shock	Asian/Pacific Islander	8.7 (6.0, 11.5)	6.9 (4.4, 9.4)	12.8 (9.4, 16.3)	14.2 (10.6, 17.8)	15.2 (11.5, 18.9)
Shock	Black or African American	6.5 (4.9, 8.2)	7.9 (6.2, 9.6)	8.7 (6.9, 10.5)	9.8 (8.0, 11.7)	11.7 (9.5, 13.9)
Shock	White	5.0 (4.2, 5.7)	4.5 (3.8, 5.2)	5.0 (4.3, 5.8)	5.4 (4.6, 6.1)	5.7 (4.9, 6.5)
Shock	All other races[a]	4.5 (2.4, 6.5)	6.5 (4.0, 9.0)	6.8 (4.2, 9.3)	5.3 (3.0, 7.6)	7.0 (4.2, 9.7)
Shock	Hispanic or Latina[b]	6.3 (5.1, 7.6)	6.0 (4.8, 7.3)	7.6 (6.1, 9.1)	7.1 (5.7, 8.5)	6.0 (4.6, 7.3)

Severe maternal morbidity indicator	Race and ethnicity	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)
Ventilation	Not Hispanic or Latina	na	na	na	na	na
Ventilation	Asian/Pacific Islander	6.3 (4.0, 8.6)	4.5 (2.4, 6.5)	6.4 (4.0, 8.8)	5.1 (3.0, 7.2)	5.5 (3.2, 7.8)
Ventilation	Black or African American	8.3 (6.5, 10.1)	9.5 (7.6, 11.3)	9.7 (7.8, 11.6)	8.9 (7.0, 10.8)	11.9 (9.7, 14.0)
Ventilation	White	3.7 (3.1, 4.3)	3.7 (3.1, 4.4)	3.8 (3.1, 4.4)	3.3 (2.7, 3.9)	3.7 (3.0, 4.3)
Ventilation	All other races[a]	5.0 (2.8, 7.2)	4.7 (2.6, 6.8)	4.4 (2.3, 6.6)	5.6 (3.2, 8.0)	7.6 (4.6, 10.5)
Ventilation	Hispanic or Latina[b]	5.7 (4.5, 6.9)	4.8 (3.7, 5.9)	5.7 (4.4, 6.9)	5.1 (3.9, 6.4)	6.7 (5.4, 7.9)
Puerperal cerebrovascular disorder	Not Hispanic or Latina	na	na	na	na	na
Puerperal cerebrovascular disorder	Asian/Pacific Islander	1.8 (0.6, 3.0)	2.2 (0.9, 3.6)	1.6 (0.4, 2.8)	3.0 (1.2, 4.8)	3.2 (1.4, 5.1)
Puerperal cerebrovascular disorder	Black or African American	4.6 (3.2, 5.9)	4.2 (2.9, 5.4)	5.9 (4.4, 7.4)	4.5 (3.2, 5.9)	5.9 (4.2, 7.5)
Puerperal cerebrovascular disorder	White	2.6 (2.1, 3.2)	2.5 (2.0, 3.0)	2.9 (2.4, 3.5)	3.4 (2.8, 4.0)	3.1 (2.5, 3.7)
Puerperal cerebrovascular disorder	All other races[a]	3.4 (1.6, 5.2)	3.6 (1.8, 5.5)	5.7 (3.3, 8.2)	3.6 (1.7, 5.6)	4.7 (2.3, 7.0)
Puerperal cerebrovascular disorder	Hispanic or Latina[b]	2.8 (1.9, 3.7)	2.9 (2.0, 3.7)	2.8 (1.9, 3.7)	3.2 (2.2, 4.1)	4.2 (3.1, 5.3)

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample 2016-2020. | GAO-24-106271

Notes: Severe maternal morbidity is an unexpected adverse outcome of labor and delivery that results in significant short- or long-term health consequences. These data reflect national estimates based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years where a procedure or diagnosis code indicating severe maternal morbidity appears on the discharge record. These data exclude cases where blood transfusions are the sole indicator of severe maternal morbidity, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. The estimated severe maternal morbidity rate is the weighted count of deliveries with a severe maternal morbidity indicator per 10,000 deliveries. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race.

[b]Hispanic or Latina women may be of any race.

Table 20: Estimated Rate of 10 Most Common Severe Maternal Morbidity Indicators among In-Hospital Deliveries by Expected Payer for the Delivery, 2016—2020

Severe maternal morbidity indicator	Expected payer	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)
Disseminated intravascular coagulation	Private insurance	20.2 (18.6, 21.9)	21.0 (19.2, 22.9)	20.7 (18.9, 22.5)	21.2 (19.4, 23.0)	21.8 (19.9, 23.7)
Disseminated intravascular coagulation	Medicaid	19.1 (17.0, 21.1)	19.5 (17.8, 21.3)	21.0 (19.2, 22.9)	21.4 (19.2, 23.5)	22.6 (20.1, 25.2)
Acute renal failure	Private insurance	8.4 (7.3, 9.5)	10.2 (9.0, 11.3)	10.9 (9.6, 12.3)	14.5 (13.0, 16.0)	17.2 (15.3, 19.1)
Acute renal failure	Medicaid	12.3 (10.9, 13.7)	12.6 (11.2, 14.0)	15.1 (13.5, 16.7)	15.9 (14.3, 17.6)	21.4 (19.3, 23.5)
Adult respiratory distress syndrome	Private insurance	6.3 (5.5, 7.1)	7.4 (6.5, 8.4)	8.5 (7.6, 9.5)	8.3 (7.3, 9.2)	10.5 (9.3, 11.6)
Adult respiratory distress syndrome	Medicaid	11.3 (10.1, 12.6)	11.3 (10.1, 12.6)	11.8 (10.5, 13.1)	12.1 (10.8, 13.4)	18.9 (17.2, 20.5)
Sepsis	Private insurance	6.8 (5.8, 7.8)	8.2 (6.9, 9.4)	8.9 (7.4, 10.4)	9.0 (7.5, 10.4)	9.4 (8.1, 10.7)
Sepsis	Medicaid	11.4 (10.1, 12.8)	11.1 (9.9, 12.4)	12.6 (11.1, 14.1)	13.9 (12.0, 15.8)	16.6 (14.6, 18.5)
Hysterectomy	Private insurance	10.4 (9.2, 11.5)	10.0 (8.9, 11.1)	11.4 (10.3, 12.6)	10.9 (9.7, 12.0)	10.6 (9.4, 11.9)
Hysterectomy	Medicaid	13.3 (11.9, 14.7)	13.1 (11.7, 14.4)	14.4 (12.8, 15.9)	14.6 (13.1, 16.2)	14.1 (12.5, 15.6)
Acute heart failure/ pulmonary edema	Private insurance	5.1 (4.3, 5.8)	5.0 (4.2, 5.8)	5.4 (4.6, 6.2)	6.1 (5.2, 6.9)	5.6 (4.8, 6.4)
Acute heart failure/ pulmonary edema	Medicaid	7.1 (6.1, 8.1)	7.1 (6.1, 8.1)	7.7 (6.7, 8.7)	8.4 (7.3, 9.5)	9.7 (8.5, 10.9)
Eclampsia	Private insurance	8.5 (7.5, 9.5)	5.7 (4.9, 6.5)	4.9 (4.2, 5.7)	5.1 (4.3, 5.8)	5.8) (4.9, 6.7)
Eclampsia	Medicaid	12.8 (11.5, 14.1)	10.5 (9.2, 11.8)	9.2 (8.1, 10.3)	9.3 (8.1, 10.5)	9.2 (8.1, 10.4)
Shock	Private insurance	4.8 (4.1, 5.5)	5.0 (4.3, 5.7)	6.4 (5.6, 7.2)	6.4 (5.5, 7.2)	6.5 (5.7, 7.4)
Shock	Medicaid	6.6 (5.7, 7.5)	6.1 (5.3, 7.0)	7.1 (6.1, 8.0)	7.6 (6.6, 8.6)	7.8 (6.8, 8.8)
Ventilation	Private insurance	3.6 (3.0, 4.2)	3.8 (3.1, 4.4)	4.2 (3.5, 4.8)	3.6 (3.0, 4.2)	3.9 (3.3, 4.6)
Ventilation	Medicaid	6.4 (5.5, 7.3)	5.9 (5.0, 6.8)	6.0 (5.2, 6.8)	6.0 (5.1, 6.9)	8.4 (7.4, 9.5)
Puerperal cerebrovascular disorder	Private insurance	2.9 (2.4, 3.4)	2.8 (2.2, 3.3)	3.0 (2.4, 3.5)	2.9 (2.3, 3.4)	3.4 (2.7, 4.0)
Puerperal cerebrovascular disorder	Medicaid	2.7 (2.1, 3.3)	2.9 (2.3, 3.5)	3.6 (2.9, 4.3)	3.9 (3.2, 4.7)	4.0 (3.2, 4.7)

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, National Inpatient Sample 2016-2020. | GAO-24-106271

Notes: Severe maternal morbidity is an unexpected adverse outcome of labor and delivery that results in significant short- or long-term health consequences. These data reflect national estimates based on a sample of discharge records for in-hospital deliveries for females aged 12 to 55 years where a procedure or diagnosis code indicating severe maternal morbidity appears on the discharge record. These data exclude cases where blood transfusions are the sole indicator of severe maternal morbidity, because it may not always reflect severe maternal morbidity in the absence of other indicators, according to the Department of Health and Human Services. The estimated severe maternal morbidity rate is the weighted count of deliveries with a severe maternal morbidity per 10,000 deliveries. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. Expected payer is the primary payer the hospital expects to pay the hospital bill, according to Agency for Healthcare Research and Quality documentation. Data for no charge and other types of payers, such as those who self-pay, charity care, and other government payers (such as the Indian Health Service and military health care coverage) were suppressed due to small numbers in order to ensure privacy.

Table 21: Estimated Percentage of Respondents Who Reported Having Depression During Pregnancy, 2018—2021

Estimated percentage of respondents

na	na	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
na	All respondents	14.1 (13.5, 14.6)	14.8 (14.2, 15.4)	15.2 (14.7, 15.8)	16.5 (15.8, 17.1)
Race and ethnicity	Not Hispanic or Latina	na	na	na	na
Race and ethnicity	Asian/Pacific Islander	3.9 (2.8, 5.0)	5.2 (3.9, 6.4)	7.6 (5.9, 9.3)	7.3 (5.6, 9.0)
Race and ethnicity	Black or African American	15.5 (14.1, 16.9)	18.1 (16.5,19.6)	15.7 (14.4,17.0)	17.3 (15.6, 18.9)
Race and ethnicity	White	15.3 (14.6, 16.0)	16.0 (15.2, 16.7)	17.0 (16.2, 17.8)	17.9 (17.0, 18.7)
Race and ethnicity	All other races[a]	17.8 (15.5, 20.1)	16.4 (13.9, 18.8)	17.2 (15.0, 19.4)	22.0 (19.1, 24.9)
Race and ethnicity	Hispanic or Latina[b]	10.4 (9.3, 11.4)	10.3 (9.2, 11.5)	11.6 (10.4, 12.8)	12.8 (11.5, 14.0)
Insurance during pregnancy[c]	Private insurance[d]	10.7 (10.1, 11.3)	11.8 (11.1, 12.5)	12.4 (11.7, 13.1)	13.2 (12.5, 14.0)
Insurance during pregnancy[c]	Medicaid	20.1 (19.1, 21.2)	20.5 (19.4, 21.6)	20.5 (19.5, 21.6)	23.0 (21.7, 24.2)
Insurance during pregnancy[c]	Other[e]	15.8 (10.6, 21.1)	10.5 (6.2, 14.8)	10.5 (5.5, 15.6)	11.5 (4.7, 18.4)
Insurance during pregnancy[c]	No insurance[f]	9.0 (6.2, 11.8)	9.2 (6.5, 12.0)	7.8 (5.3, 10.3)	15.2 (10.6, 19.7)
Age	Under age 20	21.4 (18.5, 24.2)	23.5 (20.2, 26.9)	23.3 (20.3, 26.4)	27.3 (23.5, 31.1)
Age	Age 20-24	20.6 (19.1, 22.0)	22.3 (20.6, 24.0)	21.2 (19.7, 22.7)	23.3 (21.5, 25.1)
Age	Age 25-34	12.8 (12.2, 13.4)	13.3 (12.6, 14.0)	14.3 (13.6, 15.0)	15.4 (14.7, 16.2)

na	na	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Age	Age 35 and older	9.7 (8.8 ,10.6)	10.1 (9.1, 11.1)	11.0 (10.0, 12.1)	11.8 (10.6, 12.9)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that participate in the Pregnancy Risk Assessment Monitoring System survey and had at least a 50 percent response rate. As a result, the states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race, according to CDC officials.

[b]Hispanic or Latina women may be of any race.

[c]Insurance during pregnancy is the type of insurance respondents reported having for prenatal care. As a result, respondents who reported not having prenatal care are excluded from this section, according to CDC officials.

[d]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[e]Other insurance in this data source includes other state-specific government plans or programs.

[f]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

Table 22: Estimated Percentage of Respondents Who Reported Depressive Symptoms After Pregnancy, 2018—2021

Estimated percentage of respondents

		Respondents reporting always or often feeling down, hopeless, or depressed since delivery			
na	**na**	**2018 (confidence intervals)**	**2019 (confidence intervals)**	**2020 (confidence intervals)**	**2021 (confidence intervals)**
na	All respondents	7.1 (6.7, 7.4)	7.5 (7.0, 7.9)	7.6 (7.2, 8.0)	7.5 (7.0, 7.9)
Race and ethnicity	Not Hispanic or Latina	na	na	na	na
Race and ethnicity	Asian/Pacific Islander	4.6 (3.4, 5.8)	4.6 (3.2, 6.0)	4.9 (3.5, 6.2)	6.2 (4.5, 7.8)
Race and ethnicity	Black or African American	7.8 (6.9, 8.8)	8.8 (7.7, 9.9)	8.1 (7.1, 9.1)	7.7 (6.6, 8.8)
Race and ethnicity	White	7.4 (6.9, 7.9)	7.8 (7.2, 8.4)	7.9 (7.4, 8.5)	7.7 (7.1, 8.3)
Race and ethnicity	All other races[a]	9.0 (7.4, 10.6)	9.2 (7.0, 11.4)	10.0 (8.1, 12.0)	10.6 (8.4, 12.8)
Race and ethnicity	Hispanic or Latina[b]	5.4 (4.7, 6.2)	5.6 (4.7, 6.6)	6.4 (5.4, 7.4)	6.2 (5.4, 7.0)
Insurance after pregnancy[c]	Private insurance[d]	5.8 (5.3, 6.2)	6.2 (5.7, 6.7)	6.4 (5.9, 6.9)	6.1 (5.6, 6.6)

na	na	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Insurance after pregnancy[c]	Medicaid	9.5 (8.7, 10.3)	10.4 (9.5, 11.3)	9.9 (9.1, 10.7)	10.1 (9.3, 11.0)
Insurance after pregnancy[c]	Other[e]	11.5 (7.2, 15.8)	5.0 (2.4, 7.6)	6.6 (2.0, 11.2)	7.9 (2.6, 13.2)
Insurance after pregnancy[c]	No insurance[f]	7.4 (6.1, 8.6)	7.1 (5.8, 8.5)	6.1 (4.4, 7.7)	6.9 (5.1, 8.7)
Age	Under age 20	10.8 (8.8, 12.8)	11.4 (8.9, 13.9)	13.3 (10.7, 16.0)	12.2 (9.6, 14.9)
Age	Age 20-24	10.6 (9.5, 11.7)	11.4 (10.1, 12.6)	10.1 (9.0, 11.2)	10.7 (9.4, 11.9)
Age	Age 25-34	6.3 (5.8, 6.7)	6.6 (6.1, 7.1)	7.1 (6.6, 7.7)	7.1 (6.5, 7.6)
Age	Age 35 and older	5.2 (4.5, 5.9)	5.5 (4.7, 6.3)	5.4 (4.6, 6.2)	5.1 (4.4, 5.9)

Respondents reporting always or often having little interest or pleasure in doing things they usually enjoyed since delivery

na	All respondents	10.1 (9.6, 10.5)	9.9 (9.4, 10.3)	9.8 (9.4, 10.3)	9.4 (8.9, 9.9)
Race and ethnicity	Not Hispanic or Latina	na	na	na	na
Race and ethnicity	Asian/Pacific Islander	18.1 (15.8, 20.4)	14.7 (12.7, 16.8)	14.3 (12.2, 16.4)	19.4 (16.7, 22.0)
Race and ethnicity	Black or African American	14.7 (13.4, 16.1)	15.4 (14.0, 16.7)	12.7 (11.5, 13.9)	12.7 (11.3, 14.1)
Race and ethnicity	White	8.3 (7.8, 8.8)	8.1 (7.6, 8.7)	8.4 (7.8, 9.0)	7.9 (7.3, 8.4)
Race and ethnicity	All other races[a]	12.8 (10.8, 14.8)	13.2 (10.7, 15.6)	13.6 (11.2, 15.9)	12.1 (9.8, 14.4)
Race and ethnicity	Hispanic or Latina[b]	9.0 (8.1, 10.0)	8.6 (7.5, 9.7)	9.5 (8.4, 10.6)	8.5 (7.5, 9.5)
Insurance after pregnancy[c]	Private insurance[d]	7.9 (7.3, 8.4)	7.5 (7.0, 8.0)	7.6 (7.1, 8.1)	7.4 (6.8, 7.9)
Insurance after pregnancy[c]	Medicaid	13.3 (12.4, 14.3)	13.9 (12.9, 14.9)	13.0 (12.1, 13.9)	12.9 (11.9, 13.8)
Insurance after pregnancy[c]	Othere	17.1 (12.3, 22.0)	10.5 (5.6, 15.4)	13.7 (8.1, 19.3)	9.2 (4.7, 13.7)
Insurance after pregnancy[c]	No insurance[f]	10.9 (9.5, 12.4)	10.5 (9.0, 12.0)	10.3 (8.4, 12.2)	10.4 (8.2, 12.6)
Age	Under age 20	16.4 (13.7, 19.2)	15.5 (12.6, 18.5)	17.0 (14.1, 20.0)	14.4 (11.5, 17.3)
Age	Age 20-24	13.4 (12.2, 14.6)	14.2 (12.8, 15.6)	12.5 (11.3, 13.7)	12.4 (11.1, 13.8)
Age	Age 25-34	9.1 (8.5, 9.6)	9.0 (8.5, 9.6)	9.2 (8.6, 9.8)	9.0 (8.4, 9.6)
Age	Age 35 and older	8.4 (7.5, 9.3)	7.2 (6.4, 8.0)	7.8 (6.9, 8.7)	7.2 (6.3, 8.1)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that participate in the Pregnancy Risk Assessment Monitoring System survey and had at

least a 50 percent response rate. As a result, the states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race, according to CDC officials.

[b]Hispanic or Latina women may be of any race.

[c]Insurance after pregnancy is the type of insurance respondents reported having after pregnancy.

[d]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[e]Other insurance in this data source includes other state-specific government plans or programs.

[f]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

Table 23: Estimated Percentage of Respondents Who Reported Feeling More Depressed Than Usual Due to the COVID-19 Pandemic, 2020—2021

Estimated percentage of respondents

na	na	2020 (confidence intervals)	2021 (confidence intervals)
na	All respondents	29.0 (27.8, 30.2)	25.7 (24.6, 26.8)
Race and ethnicity	Not Hispanic or Latina	na	na
Race and ethnicity	Asian/Pacific Islander	24.8 (20.4, 29.3)	17.9 (14.1, 21.6)
Race and ethnicity	Black or African American	26.3 (23.5, 29.2)	24.0 (20.6, 27.4)
Race and ethnicity	White	31.2 (29.5, 32.9)	26.9 (25.3, 28.5)
Race and ethnicity	All other races[a]	29.7 (23.5, 35.9)	31.0 (25.8, 36.2)
Race and ethnicity	Hispanic or Latina[b]	25.8 (23.2, 28.3)	24.8 (22.7, 26.8)
Insurance during pregnancy[c]	Private insurance[d]	28.1 (26.5, 29.7)	23.8 (22.5, 25.2)
Insurance during pregnancy[c]	Medicaid	31.4 (29.2, 33.5)	29.1 (26.9, 31.2)
Insurance during pregnancy[c]	Other[e]	26.6 (14.6, 38.6)	21.7 (11.9, 31.5)
Insurance during pregnancy[c]	No insurance[f]	20.0 (13.5, 26.5)	23.2 (16.0, 30.5)
Age	Under age 20	25.9 (19.4, 32.5)	28.2 (21.2, 35.2)
Age	Age 20 – 24	31.0 (27.8, 34.1)	26.6 (23.7, 29.5)
Age	Age 25 – 34	28.8 (27.2, 30.3)	25.6 (24.2, 27.1)
Age	Age 35 and older	28.3 (25.9, 30.8)	24.6 (22.4, 26.8)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions

included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race, according to CDC officials.

[b]Hispanic or Latina women may be of any race.

[c]Insurance during pregnancy is the type of insurance respondents reported having for prenatal care. As a result, respondents who reported not having prenatal care are excluded from this section, according to CDC officials.

[d]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[e]Other insurance in this data source includes other state-specific government plans or programs.

[f]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

Table 24: Estimated Percentage of Respondents Who Reported Feeling More Anxious Than Usual Due to the COVID-19 Pandemic, 2020—2021

Estimated percentage of respondents

na	na	2020 (confidence intervals)	2021 (confidence intervals)
na	All respondents	51.1 (49.8, 52.5)	46.1 (44.8, 47.3)
Race and ethnicity	Not Hispanic or Latina	Na	na
Race and ethnicity	Asian/Pacific Islander	41.9 (37.0, 46.7)	34.1 (29.8, 38.5)
Race and ethnicity	Black or African American	42.7 (39.3, 46.0)	39.5 (35.7, 43.3)
Race and ethnicity	White	56.3 (54.5, 58.1)	50.8 (49.0, 52.5)
Race and ethnicity	All other races[a]	52.2 (45.5, 58.8)	52.1 (46.4, 57.8)
Race and ethnicity	Hispanic or Latina[b]	46.1 (43.1, 49.0)	41.1 (38.7, 43.5)
Insurance during pregnancy[c]	Private insurance[d]	55.1 (53.4, 56.9)	49.5 (47.9, 51.0)
Insurance during pregnancy[c]	Medicaid	48.1 (45.8, 50.4)	42.6 (40.2, 44.9)
Insurance during pregnancy[c]	Other[e]	41.0 (27.8, 54.2)	35.5 (24.2, 46.9)
Insurance during pregnancy[c]	No insurance[f]	36.6 (28.3, 44.8)	37.4 (28.8, 46.0)
Age	Under age 20	37.1 (29.8, 44.3)	35.4 (27.7, 43.0)
Age	Age 20 - 24	44.8 (41.5, 48.2)	40.9 (37.6, 44.2)
Age	Age 25 - 34	52.6 (50.9, 54.4)	47.2 (45.6, 48.9)
Age	Age 35 and older	54.8 (52.1, 57.6)	48.6 (46.0, 51.2)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19

Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race, according to CDC officials.

[b]Hispanic or Latina women may be of any race.

[c]Insurance during pregnancy is the type of insurance respondents reported having for prenatal care. As a result, respondents who reported not having prenatal care are excluded from this section, according to CDC officials.

[d]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[e]Other insurance in this data source includes other state-specific government plans or programs.

[f]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

Table 25: Percentage of Births by Timing of First Prenatal Visit by Mother's Race and Ethnicity, 2016—2021

Percentage of births

Timing of first prenatal visit	Mother's race and ethnicity	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
First trimester	Not Hispanic or Latina	na	na	na	na	na	na
First trimester	American Indian or Alaska Native	63.0 (62.4, 63.5)	63.4 (62.9, 64.0)	62.6 (62.1, 63.2)	63.7 (63.2, 64.3)	64.0 (63.4, 64.6)	65.8 (65.2, 66.4)
First trimester	Asian	80.6 (80.4, 80.7)	81.1 (81.0, 81.3)	81.8 (81.7, 82.0)	82.1 (82.0, 82.3)	82.4 (82.2, 82.5)	83.5 (83.3, 83.6)
First trimester	Black or African American	66.5 (66.4, 66.7)	66.6 (66.5, 66.7)	67.1 (67.0, 67.2)	67.6 (67.5, 67.7)	68.4 (68.3, 68.5)	69.7 (69.6, 69.8)
First trimester	Native Hawaiian or Other Pacific Islander	51.9 (50.9, 52.9)	52.5 (51.5, 53.5)	51.0 (49.9, 52.0)	50.0 (49.0, 51.0)	51.9 (50.9, 53.0)	51.5 (50.5, 52.6)
First trimester	White	82.3 (82.2, 82.3)	82.4 (82.4, 82.5)	82.5 (82.4, 82.5)	82.8 (82.7, 82.9)	82.8 (82.8, 82.9)	83.2 (83.2, 83.3)
First trimester	Multiracial	74.7 (74.4, 75.0)	74.8 (74.5, 75.1)	74.7 (74.4, 75.0)	75.0 (74.7, 75.3)	75.5 (75.2, 75.8)	76.6 (76.3, 76.9)
First trimester	Hispanic or Latina[a]	72.0 (71.9, 72.0)	72.3 (72.2, 72.4)	72.7 (72.6, 72.8)	72.1 (72.0, 72.2)	72.3 (72.2, 72.3)	72.5 (72.4, 72.6)
Second trimester	Not Hispanic or Latina	na	na	na	na	na	na
Second trimester	American Indian or Alaska Native	24.5 (24.0, 25.0)	24.0 (23.5, 24.4)	24.3 (23.8, 24.8)	23.3 (22.8, 23.8)	22.9 (22.4, 23.4)	21.7 (21.2, 22.2)
Second trimester	Asian	14.0 (13.8, 14.1)	13.8 (13.6, 13.9)	13.3 (13.2, 13.5)	12.9 (12.7, 13.0)	13.4 (13.2, 13.5)	12.4 (12.3, 12.6)

Timing of first prenatal visit	Mother's race and ethnicity	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Second trimester	Black or African American	23.5 (23.4, 23.6)	23.2 (23.1, 23.3)	23.0 (22.9, 23.1)	22.8 (22.7, 22.9)	22.6 (22.4, 22.7)	21.1 (21.0, 21.3)
Second trimester	Native Hawaiian or Other Pacific Islander	28.9 (28.0, 29.8)	27.9 (27.0, 28.8)	28.8 (27.9, 29.7)	29.5 (28.6, 30.4)	28.5 (27.6, 29.4)	27.4 (26.5, 28.4)
Second trimester	White	13.4 (13.4, 13.5)	13.1 (13.1, 13.2)	13.1 (13.0, 13.1)	12.7 (12.6, 12.7)	12.7 (12.6, 12.7)	12.2 (12.2, 12.3)
Second trimester	Multiracial	18.6 (18.3, 18.9)	18.2 (17.9, 18.5)	18.1 (17.8, 18.3)	17.8 (17.6, 18.1)	17.6 (17.3, 17.9)	16.4 (16.1, 16.6)
Second trimester	Hispanic or Latina[a]	20.3 (20.2, 20.4)	20.0 (19.9, 20.1)	19.6 (19.5, 19.7)	19.6 (19.5, 19.7)	19.8 (19.7, 19.9)	19.1 (19.1, 19.2)
Late or no prenatal care	Not Hispanic or Latina	na	na	na	na	na	na
Late or no prenatal care	American Indian or Alaska Native	12.5 (12.1, 12.9)	12.6 (12.2, 13.0)	13.1 (12.7, 13.4)	13.0 (12.6, 13.4)	13.1 (12.6, 13.5)	12.5 (12.1, 12.9)
Late or no prenatal care	Asian	5.4 (5.4, 5.5)	5.1 (5.0, 5.2)	4.9 (4.8, 5.0)	5.0 (4.9, 5.1)	4.3 (4.2, 4.3)	4.1 (4.0, 4.2)
Late or no prenatal care	Black or African American	10.0 9.9, 10.1)	10.2 (10.1, 10.3)	9.9 (9.8, 10.0)	9.6 (9.5, 9.7)	9.1 (9.0, 9.1)	9.1 (9.1, 9.2)
Late or no prenatal care	Native Hawaiian or Other Pacific Islander	19.2 (18.4, 20.0)	19.6 (18.8, 20.4)	20.2 (19.4, 21.1)	20.5 (19.7, 21.3)	19.6 (18.7, 20.4)	21.0 (20.2, 21.9)
Late or no prenatal care	White	4.3 (4.3, 4.4)	4.5 (4.4, 4.5)	4.5 (4.4, 4.5)	4.5 (4.5, 4.6)	4.5 (4.5, 4.6)	4.6 (4.5, 4.6)
Late or no prenatal care	Multiracial	6.7 (6.5, 6.9)	7.0 (6.8, 7.2)	7.2 (7.0, 7.4)	7.1 (7.0, 7.3)	6.9 (6.7, 7.0)	7.0 (6.9, 7.2)
Late or no prenatal care	Hispanic or Latina[a]	7.7 (7.7, 7.8)	7.7 (7.7, 7.8)	7.7 (7.6, 7.7)	8.2 (8.2, 8.3)	7.9 (7.9, 8.0)	8.4 (8.3, 8.4)

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Notes: The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone. Percentages and 95 percent confidence intervals were rounded to the tenth decimal place at the end of the calculation.

[a]Hispanic or Latina women may be of any race.

Table 26: Percentage of Births by Timing of First Prenatal Visit by Payer for the Delivery, 2016—2021

Percentage of births

Timing of first prenatal visit	Payer	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
First trimester	Private insurance	87.0 (86.9, 87.0)	87.1 (87.1, 87.2)	87.2 (87.1, 87.2)	87.2 (87.2, 87.3)	87.0 (86.9, 87.0)	87.1 (87.0, 87.1)
First trimester	Medicaid	68.1 (68.0, 68.2)	68.3 (68.2, 68.4)	68.4 (68.4, 68.5)	68.3 (68.2, 68.4)	68.6 (68.6, 68.7)	69.7 (69.6, 69.8)

Timing of first prenatal visit	Payer	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
First trimester	Other[a]	75.0 (74.8, 75.2)	76.0 (75.8, 76.2)	75.6 (75.4, 75.8)	78.1 (77.9, 78.4)	78.5 (78.3, 78.7)	77.4 (77.2, 77.7)
First trimester	Self-pay[b]	54.8 (54.6, 55.0)	55.1 (54.9, 55.4)	55.7 (55.4, 55.9)	55.1 (54.9, 55.4)	54.6 (54.4, 54.9)	54.6 (54.3, 54.9)
Second trimester	Private insurance	10.3 (10.3, 10.4)	10.1 (10.1, 10.2)	10.1 (10.1, 10.2)	9.9 (9.9, 10.0)	10.0 (10.0, 10.1)	9.9 (9.8, 9.9)
Second trimester	Medicaid	23.3 (23.2, 23.4)	22.9 (22.9, 23.0)	22.7 (22.7, 22.8)	22.6 (22.5, 22.6)	22.5 (22.5, 22.6)	21.2 (21.2, 21.3)
Second trimester	Other[a]	16.8 (16.6, 17.0)	16.2 (16.0, 16.4)	16.4 (16.2, 16.6)	14.9 (14.7, 15.1)	15.1 (14.9, 15.3)	15.4 (15.2, 15.6)
Second trimester	Self-pay[b]	25.4 (25.2, 25.6)	25.4 (25.2, 25.6)	24.8 (24.6, 25.0)	25.2 (25.0, 25.4)	27.0 (26.8, 27.2)	27.1 (26.9, 27.3)
Late or no prenatal care	Private insurance	2.7 (2.7, 2.7)	2.8 (2.7, 2.8)	2.7 (2.7, 2.7)	2.9 (2.8, 2.9)	3.0 (2.9, 3.0)	3.1 (3.0, 3.1)
Late or no prenatal care	Medicaid	8.6 (8.6, 8.7)	8.8 (8.8, 8.8)	8.8 (8.8, 8.9)	9.1 (9.1, 9.2)	8.8 (8.8, 8.9)	9.0 (9.0, 9.1)
Late or no prenatal care	Other[a]	8.2 (8.1, 8.3)	7.8 (7.6, 7.9)	8.0 (7.8, 8.1)	6.9 (6.8, 7.1)	6.4 (6.3, 6.6)	7.2 (7.0, 7.3)
Late or no prenatal care	Self-pay[b]	19.8 (19.6, 20.0)	19.5 (19.3, 19.7)	19.6 (19.4, 19.8)	19.7 (19.5, 19.9)	18.4 (18.2, 18.6)	18.3 (18.1, 18.5)

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Notes: The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone. Percentages and 95 percent confidence intervals were rounded to the tenth decimal place at the end of the calculation. Payer is the primary source of payment for the delivery.

[a]Other payers in this data source include other federal and state government programs, such as the Indian Health Service or military health care coverage, and charity care.

[b]Self-pay in this data source means no third-party payer was identified.

Table 27: Percentage of Births by Timing of First Prenatal Visit by Mother's Age, 2016—2021

Percentage of births

Timing of first prenatal visit	Mother's age	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
First trimester	Under age 20	61.2 (61.0, 61.4)	61.2 (61.0, 61.4)	61.2 (61.0, 61.5)	61.1 (60.9, 61.3)	61.5 (61.2, 61.7)	61.6 (61.4, 61.9)
First trimester	Age 20 - 24	70.3 (70.2, 70.4)	70.5 (70.4, 70.6)	70.9 (70.8, 71.0)	71.0 (70.9, 71.1)	71.4 (71.3, 71.5)	72.3 (72.1, 72.4)
First trimester	Age 25 - 34	79.9 (79.8, 79.9)	79.9 (79.8, 80.0)	79.9 (79.8, 80.0)	79.9 (79.9, 80.0)	80.0 (79.9, 80.0)	80.5 (80.4, 80.5)

Timing of first prenatal visit	Mother's age	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
First trimester	Age 35 and older	81.1 (81.0, 81.2)	81.0 (80.9, 81.1)	81.0 (80.9, 81.1)	81.0 (80.9, 81.1)	80.7 (80.6, 80.8)	81.0 (80.9, 81.1)
Second trimester	Under age 20	27.6 (27.4, 27.8)	27.4 (27.2, 27.6)	27.1 (26.9, 27.3)	26.8 (26.6, 27.0)	26.5 (26.3, 26.8)	25.6 (25.4, 25.9)
Second trimester	Age 20 - 24	21.7 (21.7, 21.8)	21.3 (21.2, 21.4)	21.0 (20.9, 21.1)	20.7 (20.6, 20.8)	20.5 (20.4, 20.6)	19.4 (19.3, 19.5)
Second trimester	Age 25 - 34	14.7 (14.7, 14.8)	14.6 (14.6, 14.7)	14.6 (14.6, 14.7)	14.4 (14.4, 14.5)	14.6 (14.5, 14.6)	14.0 (13.9, 14.0)
Second trimester	Age 35 and older	13.9 (13.8, 14.0)	13.9 (13.8, 14.0)	13.9 (13.8, 14.0)	13.8 (13.7, 13.8)	14.2 (14.1, 14.2)	13.8 (13.8, 13.9)
Late or no prenatal care	Under age 20	11.2 (11.1, 11.3)	11.4 (11.3, 11.6)	11.7 (11.5, 11.8)	12.1 (12.0, 12.3)	12.0 (11.9, 12.2)	12.7 (12.6, 12.9)
Late or no prenatal care	Age 20 - 24	8.0 (7.9, 8.1)	8.2 (8.1, 8.2)	8.1 (8.1, 8.2)	8.3 (8.3, 8.4)	8.1 (8.0, 8.1)	8.3 (8.3, 8.4)
Late or no prenatal care	Age 25 - 34	5.4 (5.4, 5.4)	5.5 (5.5, 5.5)	5.5 (5.5, 5.5)	5.6 (5.6, 5.7)	5.5 (5.4, 5.5)	5.6 (5.5, 5.6)
Late or no prenatal care	Age 35 and older	5.0 (4.9, 5.0)	5.1 (5.1, 5.2)	5.1 (5.0, 5.2)	5.2 (5.2, 5.3)	5.1 (5.1, 5.2)	5.2 (5.1, 5.2)

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Note: The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone. Percentages and 95 percent confidence intervals were rounded to the tenth decimal place at the end of the calculation.

Table 28: Estimated Percentage of Respondents Reporting Selected Reasons for Not Getting Prenatal Care as Early as They Wanted, 2018—2021

Estimated percentage of respondents

Reasons respondents reported for not getting prenatal care as early as they wanted	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
I couldn't get an appointment when I wanted one	42.5 (39.8, 45.3)	40.3 (37.4, 43.1)	44.1 (41.2, 47.0)	46.5 (43.5, 49.6)
I didn't have enough money or insurance to pay for my visits	21.3 (19.0, 23.6)	26.3 (23.6, 29.0)	20.8 (18.3, 23.2)	16.2 (13.8, 18.6)
I didn't have any transportation to get to the clinic or doctor's office	11.1 (9.3, 12.9)	11.1 (9.2, 13.0)	8.7 (7.0, 10.4)	8.0 (6.2, 9.7)
My doctor or my health plan would not start care as early as I wanted	27.4 (24.9, 29.9)	27.4 (24.7, 30.2)	29.4 (26.6, 32.2)	32.9 (29.9, 35.9)

Reasons respondents reported for not getting prenatal care as early as they wanted	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
I had too many other things going on	17.6 (15.4, 19.9)	20.4 (17.9, 22.9)	15.4 (13.2, 17.6)	15.9 (13.5, 18.2)
I couldn't take time off from work or school	9.6 (7.9, 11.4)	9.2 (7.4, 11.0)	7.7 (6.1, 9.3)	6.6 (5.1, 8.1)
I didn't have my Medicaid card	17.0 (14.9, 19.1)	19.4 (17.0, 21.7)	16.9 (14.6, 19.2)	13.2 (11.0, 15.4)
I didn't have anyone to take care of my children	6.9 (5.4, 8.4)	6.9 (5.4, 8.4)	7.5 (5.9, 9.2)	6.9 (5.3, 8.5)
I didn't know that I was pregnant	36.7 (34.0, 39.3)	35.5 (32.8, 38.3)	33.2 (30.4, 36.0)	25.1 (22.5, 27.8)
I didn't want anyone else to know I was pregnant	10.4 (8.6, 12.2)	11.8 (9.8, 13.7)	8.9 (7.2, 10.6)	8.9 (7.1, 10.8)
I didn't want prenatal care	4.0 (2.8, 5.2)	4.5 (3.2, 5.9)	3.6 (2.7, 4.6)	4.6 (3.2, 6.0)

Source: Centers for Disease Control and Prevention, Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that participate in the Pregnancy Risk Assessment Monitoring System survey and had at least a 50 percent response rate. As a result, the states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

Table 29: Estimated Percentage of Respondents Reporting Selected Reasons for Prenatal Appointment Cancellations or Delays during COVID-19 Pandemic, 2020—2021

Estimated percentage of respondents

Reasons respondents reported for canceled or delayed prenatal appointments during the COVID-19 pandemic	2020 (confidence intervals)	2021 (confidence intervals)
My appointments were canceled or delayed because my provider's office was closed or had reduced hours	16.1 (15.1, 17.1)	7.0 (6.3, 7.6)
I canceled or delayed because I was afraid of being exposed to COVID-19 during the appointment	7.6 (6.9, 8.3)	3.4 (3.0, 3.9)
I canceled or delayed because I lost my health insurance during the COVID-19 pandemic	1.2 (0.9, 1.5)	1.0 (0.7, 1.3)
I canceled or delayed because I had problems finding care for my children or other family members	8.1 (7.3, 8.8)	7.2 (6.5, 7.9)
I canceled or delayed because I worried about taking public transportation and had no other way to get there	2.7 (2.3, 3.1)	2.4 (2.0, 2.8)
My appointments were canceled or delayed because I had to self-isolate due to possible COVID-19 exposure or infection	6.9 (6.2, 7.6)	9.9 (9.1, 10.6)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the

combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

Table 30: Estimated Percentage of Respondents Who Attended Prenatal Visits In-Person or Virtually during COVID-19 Pandemic, 2020—2021

Estimated percentage of respondents

Type of visit	2020 (confidence intervals)	2021 (confidence intervals)
In-person only	66.9 (65.8, 68.1)	75.8 (74.8, 76.8)
Virtual only	1.3 (1.0, 1.5)	1.2 (0.9, 1.5)
Both in-person and virtual	30.6 (29.4, 31.7)	21.1 (20.2, 22.1)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

About 1 percent and 2 percent of respondents reported not attending any prenatal visits in 2020 and 2021, respectively.

Table 31: Estimated Percentage of Respondents Who Attended Prenatal Visits In-Person, Virtually, or Both during the COVID-19 Pandemic by Race and Ethnicity, 2020—2021

Estimated percentage of respondents

Type of visit	Race and ethnicity	2020 (confidence intervals)	2021 (confidence intervals)
In-person only	Not Hispanic or Latina	na	na
In-person only	Asian/Pacific Islander	57.6 (52.8, 62.3)	64.5 (60.1, 68.8)
In-person only	Black or African American	68.5 (65.5, 71.6)	78.6 (75.7, 81.5)
In-person only	White	68.0 (66.4, 69.6)	77.4 (76.0, 78.8)
In-person only	All other races[a]	64.8 (58.6, 71.0)	73.6 (68.8, 78.5)
In-person only	Hispanic or Latina[b]	65.7 (62.9, 68.4)	73.8 (71.7, 75.9)
Both in-person and virtual	Not Hispanic or Latina	na	na
Both in-person and virtual	Asian/Pacific Islander	37.2 (32.7, 41.8)	31.2 (26.9, 35.4)
Both in-person and virtual	Black or African American	28.9 (26.0, 31.9)	18.4 (15.7, 21.1)
Both in-person and virtual	White	30.5 (28.9, 32.1)	20.9 (19.6, 22.2)
Both in-person and virtual	All other races[a]	31.3 (25.3, 37.3)	23.6 (18.9, 28.3)

Type of visit	Race and ethnicity	2020 (confidence intervals)	2021 (confidence intervals)
Both in-person and virtual	Hispanic or Latina[b]	30.2 (27.6, 32.8)	20.4 (18.6, 22.2)
Virtual only	Not Hispanic or Latina	na	na
Virtual only	Asian/Pacific Islander	2.8 (0.8, 4.8)	1.0 (0.4, 1.5)
Virtual only	Black or African American	1.5 (0.8, 2.3)	0.6 (0.2, 0.9)
Virtual only	White	0.6 (0.4, 0.8)	0.6 (0.4, 0.8)
Virtual only	All other races[a]	1.1 (0.4, 1.8)	0.8 (0.0, 2.1)
Virtual only	Hispanic or Latina[b]	2.6 (1.7, 3.5)	3.0 (2.1, 3.9)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. About 1 percent of respondents reported not attending any prenatal visits each year.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race, according to CDC officials.

[b]Hispanic or Latina women may be of any race.

Table 32: Estimated Percentage of Respondents Who Attended Prenatal Visits In-Person, Virtually, or Both during the COVID-19 Pandemic by Insurance during Pregnancy, 2020—2021

Estimated percentage of respondents

Type of visit	Insurance during pregnancy	2020 (confidence intervals)	2021 (confidence intervals)
In-person only	Private insurance[a]	65.6 (64.0, 67.2)	76.4 (75.1, 77.6)
In-person only	Medicaid	69.4 (67.3, 71.5)	76.1 (74.1, 78.0)
In-person only	Other[b]	67.5 (55.3, 79.7)	81.1 (73.4, 88.7)
In-person only	No insurance[c]	74.6 (68.2, 81.0)	73.1 (65.4, 80.7)
Both in-person and virtual	Private insurance[a]	33.4 (31.8, 34.9)	22.4 (21.1, 23.6)
Both in-person and virtual	Medicaid	28.0 (26.0, 30.0)	20.4 (18.6, 22.2)
Both in-person and virtual	Other[b]	31.1 (19.0, 43.3)	13.6 (7.7, 19.5)
Both in-person and virtual	No insurance[c]	18.0 (12.4, 23.6)	18.6 (11.7, 25.5)
Virtual only	Private insurance[a]	0.8 (0.5, 1.0)	0.6 (0.4, 0.9)
Virtual only	Medicaid	1.7 (1.1, 2.3)	1.9 (1.3, 2.5)
Virtual only	Other[b]	0.5 (0.0, 1.6)	0.8 (0.0, 1.6)
Virtual only	No insurance[c]	2.2 (0.6, 3.8)	2.3 (0.4, 4.1)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. Insurance during pregnancy is the type of insurance respondents reported having for prenatal care. As a result, respondents who reported not having prenatal care are excluded from this section, according to CDC officials. About 1 percent and 2 percent of respondents reported not attending any prenatal visits in 2020 and 2021, respectively.

[a]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[b]Other insurance in this data source includes other state-specific government plans or programs.

[c]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

Table 33: Estimated Percentage of Respondents Who Attended Prenatal Visits In-Person, Virtually, or Both during the COVID-19 Pandemic by Age, 2020—2021

Estimated percentage of respondents

Type of visit	Age	2020 (confidence intervals)	2021 (confidence intervals)
In-person only	Under age 20	74.2 (68.0, 80.3)	80.5 (74.9, 86.0)
In-person only	Age 20 - 24	72.0 (69.1, 74.9)	80.0 (77.4, 82.7)
In-person only	Age 25 - 34	65.9 (64.4, 67.5)	76.0 (74.7, 77.3)
In-person only	Age 35 and older	64.2 (61.6, 66.7)	71.5 (69.3, 73.7)
Both in-person and virtual	Under age 20	23.5 (17.5, 29.6)	17.2 (11.8, 22.6)
Both in-person and virtual	Age 20 - 24	24.5 (21.7, 27.2)	16.3 (13.9, 18.7)
Both in-person and virtual	Age 25 - 34	32.0 (30.4, 33.5)	20.9 (19.7, 22.1)
Both in-person and virtual	Age 35 and older	33.2 (30.7, 35.7)	26.0 (23.8, 28.1)
Virtual only	Under age 20	0.6 (0.2, 1.0)	1.1 (0.2, 1.9)
Virtual only	Age 20 - 24	1.8 (0.9, 2.8)	1.9 (1.0, 2.7)
Virtual only	Age 25 - 34	1.2 (0.8, 1.5)	1.2 (0.8, 1.5)
Virtual only	Age 35 and older	1.2 (0.7, 1.7)	0.8 (0.4, 1.2)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. About 1 percent and 2 percent of respondents reported not attending any prenatal visits in 2020 and 2021, respectively.

Table 34: Estimated Percentage of Respondents Reporting Selected Reasons for Not Attending a Virtual Prenatal Visit during the COVID-19 Pandemic, 2020—2021

Estimated percentage of respondents

Reasons for not attending virtual prenatal appointment	2020 (confidence intervals)	2021 (confidence intervals)
Lack of availability of virtual appointments from my provider	29.5 (27.9, 31.1)	29.0 (27.5, 30.5)
Lack of an available telephone to use for appointments	3.5 (2.9, 4.2)	3.2 (2.6, 3.7)
Lack of enough cellular data or cellular minutes	1.9 (1.4, 2.5)	1.5 (1.1, 2.0)
Lack of a computer or device	3.4 (2.7, 4.1)	2.7 (2.1, 3.3)
Lack of internet service or had unreliable internet	3.3 (2.6, 3.9)	3.1 (2.5, 3.8)
Lack of a private or confidential space to use	2.1 (1.5, 2.7)	1.9 (1.4, 2.4)
I preferred seeing my health care provider in person	78.1 (76.7, 79.6)	80.1 (78.8, 81.4)
Other reason	19.5 (17.9, 21.0)	16.8 (15.5, 18.2)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. About 1 percent and 2 percent of respondents reported not attending any prenatal visits in 2020 and 2021, respectively.

Table 35: Percentage of Births by Location by Mother's Race and Ethnicity, 2016—2021

Percentage of births

Location of delivery	Mother's race and ethnicity	2016 (confidence interva!ls)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Hospital	Not Hispanic or Latina	na	na	na	na	na	na
Hospital	American Indian or Alaska Native	99.0 (98.9, 99.1)	99.1 (99.0, 99.2)	99.0 (98.9, 99.1)	99.0 (98.8, 99.1)	98.7 (98.5, 98.8)	98.5 (98.4, 98.7)
Hospital	Asian	99.5 (99.5, 99.6)	99.5 (99.5, 99.5)	99.5 (99.5, 99.5)	99.5 (99.5, 99.5)	99.4 (99.4, 99.4)	99.3 (99.3, 99.4)
Hospital	Black or African American	99.4 (99.3, 99.4)	99.3 (99.2, 99.3)	99.2 (99.2, 99.3)	99.2 (99.2, 99.2)	98.9 (98.9, 99.0)	98.8 (98.7, 98.8)
Hospital	Native Hawaiian or Other Pacific Islander	99.3 (99.1, 99.5)	99.2 (99.0, 99.3)	99.4 (99.2, 99.6)	99.2 (99.0, 99.3)	99.1 (98.9, 99.2)	98.7 (98.5, 99.0)
Hospital	White	97.6 (97.6, 97.6)	97.6 (97.6, 97.6)	97.5 (97.5, 97.6)	97.5 (97.5, 97.5)	97.1 (97.1, 97.1)	96.8 (96.8, 96.8)
Hospital	Multiracial	98.3 (98.2, 98.4)	98.3 (98.2, 98.4)	98.3 (98.2, 98.4)	98.3 (98.2, 98.4)	97.9 (97.8, 98.0)	97.6 (97.5, 97.7)

Location of delivery	Mother's race and ethnicity	2016 (confidence interva!ls)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Hospital	Hispanic or Latina[a]	99.4 (99.4, 99.4)	99.4 (99.4, 99.4)	99.4 (99.3, 99.4)	99.3 (99.3, 99.3)	99.2 (99.2, 99.2)	99.1 (99.1, 99.1)
Freestanding birth center	Not Hispanic or Latina	na	na	na	na	na	na
Freestanding birth center	American Indian or Alaska Native	0.3 (0.2, 0.3)	0.2 (0.2, 0.3)	0.2 (0.2, 0.3)	0.3 (0.3, 0.4)	0.3 (0.3, 0.4)	0.4 (0.4, 0.5)
Freestanding birth center	Asian	0.1 (0.1, 0.2)	0.2 (0.1, 0.2)	0.1 (0.1, 0.2)	0.2 (0.1, 0.2)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)
Freestanding birth center	Black or African American	0.2 (0.1, 0.2)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.3 (0.3, 0.3)
Freestanding birth center	Native Hawaiian or Other Pacific Islander	na	0.2 (0.1, 0.3)	na	na	0.3 (0.2, 0.4)	0.3 (0.2, 0.4)
Freestanding birth center	White	0.8 (0.8, 0.8)	0.8 (0.8, 0.8)	0.8 (0.8, 0.8)	0.8 (0.8, 0.8)	0.9 (0.9, 0.9)	0.9 (0.9, 1.0)
Freestanding birth center	Multiracial	0.6 (0.6, 0.7)	0.6 (0.5, 0.6)	0.6 (0.5, 0.6)	0.6 (0.6, 0.7)	0.7 (0.7, 0.8)	0.8 (0.7, 0.8)
Freestanding birth center	Hispanic or Latina[a]	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)	0.2 (0.2, 0.3)	0.3 (0.3, 0.3)	0.3 (0.3, 0.3)
Home	Not Hispanic or Latina	na	na	na	na	na	na
Home	American Indian or Alaska Native	0.6 (0.5, 0.7)	0.5 (0.4, 0.6)	0.6 (0.5, 0.6)	0.5 (0.4, 0.6)	0.8 (0.7, 0.9)	0.9 (0.8, 1.0)
Home	Asian	0.3 (0.3, 0.3)	0.3 (0.3, 0.3)	0.3 (0.3, 0.3)	0.3 (0.3, 0.3)	0.3 (0.3, 0.4)	0.4 (0.4, 0.4)
Home	Black or African American	0.4 (0.4, 0.4)	0.4 (0.4, 0.5)	0.5 (0.5, 0.5)	0.5 (0.5, 0.5)	0.7 (0.7, 0.7)	0.8 (0.8, 0.8)
Home	Native Hawaiian or Other Pacific Islander	0.5 (0.3, 0.6)	0.5 (0.3, 0.6)	0.3 (0.2, 0.4)	0.6 (0.4, 0.7)	0.5 (0.4, 0.7)	0.8 (0.6, 0.9)
Home	White	1.5 (1.5, 1.5)	1.5 (1.5, 1.5)	1.5 (1.5, 1.6)	1.6 (1.5, 1.6)	1.9 (1.9, 1.9)	2.1 (2.0, 2.1)
Home	Multiracial	1.0 (0.9, 1.1)	1.0 (1.0, 1.1)	1.0 (1.0, 1.1)	1.0 (0.9, 1.1)	1.3 (1.2, 1.4)	1.5 (1.4, 1.6)
Home	Hispanic or Latina[a]	0.3 (0.3, 0.3)	0.3 (0.3, 0.4)	0.4 (0.3, 0.4)	0.4 (0.4, 0.4)	0.5 (0.5, 0.5)	0.5 (0.5, 0.6)

"—" indicates that data are suppressed due to small counts.

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Notes: Less than 1 percent of births occurred in other locations not reported in this table, including clinics or doctor offices. The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone. Percentages and 95 percent confidence intervals were rounded to the tenth decimal place at the end of the calculation.

[a]Hispanic or Latina women may be of any race.

Table 36: Percentage of Births by Location of Delivery by Payer for the Delivery, 2016—2021

Percentage of births

Location of delivery	Payer	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Hospital	Private insurance	99.0 (99.0, 99.1)	99.1 (99.0, 99.1)	99.1 (99.1, 99.1)	99.1 (99.1, 99.1)	99.0 (99.0, 99.0)	99.0 (99.0, 99.0)
Hospital	Medicaid	99.4 (99.4, 99.4)	99.4 (99.4, 99.4)	99.4 (99.3, 99.4)	99.3 (99.3, 99.3)	99.2 (99.2, 99.2)	99.1 (99.1, 99.2)
Hospital	Other[a]	98.4 (98.4, 98.5)	98.4 (98.3, 98.4)	98.2 (98.2, 98.3)	98.2 (98.1, 98.2)	97.9 (97.8, 98.0)	97.7 (97.6, 97.8)
Hospital	Self-pay[b]	81.8 (81.6, 82.0)	81.2 (81.0, 81.4)	80.6 (80.4, 80.8)	80.2 (80.0, 80.4)	74.1 (73.9, 74.3)	69.0 (68.8, 69.3)
Freestanding birth center	Private insurance	0.5 (0.5, 0.5)	0.5 (0.5, 0.5)	0.5 (0.5, 0.5)	0.5 (0.5, 0.5)	0.5 (0.5, 0.5)	0.5 (0.5, 0.5)
Freestanding birth center	Medicaid	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.3 (0.3, 0.3)
Freestanding birth center	Other[a]	0.3 (0.3, 0.4)	0.3 (0.3, 0.4)	0.4 (0.3, 0.4)	0.4 (0.3, 0.4)	0.4 (0.4, 0.5)	0.5 (0.4, 0.5)
Freestanding birth center	Self-pay[b]	3.8 (3.7, 3.9)	4.1 (4.0, 4.2)	4.4 (4.3, 4.5)	4.4 (4.3, 4.5)	5.2 (5.1, 5.4)	5.9 (5.8, 6.0)
Home	Private insurance	0.4 (0.4, 0.4)	0.4 (0.4, 0.4)	0.4 (0.4, 0.4)	0.4 (0.4, 0.4)	0.4 (0.4, 0.5)	0.4 (0.4, 0.4)
Home	Medicaid	0.3 (0.3, 0.3)	0.3 (0.3, 0.4)	0.4 (0.3, 0.4)	0.4 (0.4, 0.4)	0.4 (0.4, 0.5)	0.5 (0.5, 0.5)
Home	Other[a]	1.1 (1.1, 1.2)	1.2 (1.1, 1.2)	1.3 (1.3, 1.4)	1.3 (1.3, 1.4)	1.5 (1.5, 1.6)	1.6 (1.5, 1.7)
Home	Self-pay[b]	13.5 (13.4, 13.7)	13.9 (13.8, 14.1)	14.1 (14.0, 14.3)	14.5 (14.3, 14.7)	19.3 (19.1, 19.6)	23.5 (23.2, 23.7)

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Notes: Less than 2 percent of births occurred in other locations not reported in this table, including clinics or doctor offices. The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone. Percentages and 95 percent confidence intervals were rounded to the tenth decimal place at the end of the calculation. Payer is the primary source of payment for the delivery.

[a]Other payers in this data source include other federal and state government programs, such as the Indian Health Service or military health care coverage, and charity care.

[b]Self-pay in this data source means no third-party payer was identified.

Table 37: Percentage of Births by Location of Delivery by Mother's Age, 2016—2021

Percentage of births

Location of delivery	Mother's age	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Hospital	Under age 20	99.6 (99.5, 99.6)	99.6 (99.5, 99.6)	99.5 (99.5, 99.6)	99.6 (99.5, 99.6)	99.4 (99.4, 99.5)	99.4 (99.4, 99.4)
Hospital	Age 20 - 24	98.9 (98.9, 98.9)	98.8 (98.8, 98.9)	98.8 (98.8, 98.8)	98.8 (98.7, 98.8)	98.5 (98.5, 98.5)	98.3 (98.3, 98.3)
Hospital	Age 25 - 34	98.2 (98.2, 98.3)	98.2 (98.2, 98.3)	98.2 (98.2, 98.2)	98.2 (98.2, 98.2)	97.9 (97.9, 97.9)	97.6 (97.6, 97.7)
Hospital	Age 35 and older	98.1 (98.0, 98.1)	98.0 (98.0, 98.1)	98.0 (98.0, 98.1)	98.0 (98.0, 98.0)	97.6 (97.6, 97.6)	97.5 (97.5, 97.6)
Freestanding birth center	Under age 20	0.1 (0.1, 0.1)	0.1 (0.1, 0.1)	0.1 (0.1, 0.1)	0.1 (0.1, 0.1)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)
Freestanding birth center	Age 20 - 24	0.3 (0.3, 0.3)	0.4 (0.4, 0.4)	0.4 (0.4, 0.4)	0.4 (0.4, 0.4)	0.5 (0.4, 0.5)	0.5 (0.5, 0.5)
Freestanding birth center	Age 25 - 34	0.6 (0.6, 0.6)	0.6 (0.6, 0.6)	0.6 (0.6, 0.6)	0.6 (0.6, 0.6)	0.7 (0.7, 0.7)	0.7 (0.7, 0.7)
Freestanding birth center	Age 35 and older	0.5 (0.5, 0.5)	0.5 (0.5, 0.5)	0.5 (0.5, 0.6)	0.5 (0.5, 0.6)	0.6 (0.6, 0.6)	0.6 (0.6, 0.6)
Home	Under age 20	0.3 (0.3, 0.3)	0.3 (0.3, 0.3)	0.3 (0.3, 0.3)	0.3 (0.3, 0.3)	0.4 (0.3, 0.4)	0.4 (0.3, 0.4)
Home	Age 20 - 24	0.7 (0.7, 0.7)	0.7 (0.7, 0.7)	0.7 (0.7, 0.7)	0.7 (0.7, 0.8)	0.9 (0.9, 0.9)	1.0 (1.0, 1.0)
Home	Age 25 - 34	1.1 (1.0, 1.1)	1.1 (1.0, 1.1)	1.1 (1.1, 1.1)	1.1 (1.1, 1.1)	1.3 (1.3, 1.3)	1.5 (1.5, 1.5)
Home	Age 35 and older	1.3 (1.3, 1.3)	1.3 (1.3, 1.4)	1.3 (1.3, 1.4)	1.3 (1.3, 1.4)	1.6 (1.6, 1.7)	1.7 (1.7, 1.8)

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Notes: Less than 1 percent of births occurred in other locations not reported in this table, including clinics or doctor offices. The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone. Percentages and 95 percent confidence intervals were rounded to the tenth decimal place at the end of the calculation.

Table 38: Percentage of Births by Method of Delivery by Mother's Race and Ethnicity, 2016—2021

Percentage of births

Method of delivery	Mother's race and ethnicity	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Vaginal	Not Hispanic or Latina	na	na	na	na	na	na
Vaginal	American Indian or Alaska Native	72.0 (71.5, 72.5)	71.5 (71.0, 72.0)	71.3 (70.8, 71.9)	71.1 (70.6, 71.6)	71.2 (70.7, 71.8)	70.8 (70.3, 71.4)
Vaginal	Asian	66.7 (66.5, 66.9)	66.8 (66.6, 66.9)	67.0 (66.8, 67.1)	67.3 (67.2, 67.5)	67.4 (67.2, 67.6)	66.9 (66.7, 67.1)
Vaginal	Black or African American	64.1 (64.0, 64.2)	64.0 (63.8, 64.1)	63.9 (63.8, 64.0)	64.1 (64.0, 64.2)	63.7 (63.6, 63.8)	63.2 (63.1, 63.3)
Vaginal	Native Hawaiian or Other Pacific Islander	69.5 (68.6, 70.5)	69.0 (68.1, 69.9)	68.9 (68.0, 69.8)	69.8 (68.8, 70.7)	67.7 (66.8, 68.6)	67.5 (66.6, 68.5)
Vaginal	White	69.1 (69.0, 69.1)	69.1 (69.0, 69.1)	69.2 (69.1, 69.3)	69.3 (69.3, 69.4)	69.2 (69.2, 69.3)	69.0 (68.9, 69.0)
Vaginal	Multiracial	70.1 (69.8, 70.4)	70.1 (69.8, 70.4)	69.9 (69.6, 70.2)	70.2 (69.9, 70.5)	70.1 (69.8, 70.4)	69.6 (69.3, 70.0)
Vaginal	Hispanic or Latina[a]	68.3 (68.2, 68.4)	68.2 (68.1, 68.3)	68.4 (68.3, 68.5)	68.7 (68.6, 68.8)	68.6 (68.5, 68.7)	68.4 (68.3, 68.5)
C-section	Not Hispanic or Latina	na	na	na	na	na	na
C-section	American Indian or Alaska Native	28.0 (27.5, 28.5)	28.5 (28.0, 29.0)	28.7 (28.1, 29.2)	28.9 (28.4, 29.4)	28.8 (28.2, 29.3)	29.2 (28.6, 29.7)
C-section	Asian	33.3 (33.1, 33.5)	33.2 (33.1, 33.4)	33.0 (32.9, 33.2)	32.7 (32.5, 32.8)	32.6 (32.4, 32.8)	33.1 (32.9, 33.3)
C-section	Black or African American	35.9 (35.8, 36.0)	36.0 (35.9, 36.2)	36.1 (36.0, 36.2)	35.9 (35.8, 36.0)	36.3 (36.2, 36.4)	36.8 (36.7, 36.9)
C-section	Native Hawaiian or Other Pacific Islander	30.5 (29.5, 31.4)	31.0 (30.1, 31.9)	31.1 (30.2, 32.0)	30.2 (29.3, 31.2)	32.3 (31.4, 33.2)	32.5 (31.5, 33.4)
C-section	White	30.9 (30.9, 31.0)	30.9 (30.9, 31.0)	30.8 (30.7, 30.9)	30.7 (30.6, 30.7)	30.8 (30.7, 30.8)	31.0 (31.0, 31.1)
C-section	Multiracial	29.9 (29.6, 30.2)	29.9 (29.6, 30.2)	30.1 (29.8, 30.4)	29.8 (29.5, 30.1)	29.9 (29.6, 30.2)	30.4 (30.0, 30.7)
C-section	Hispanic or Latina[a]	31.7 (31.6, 31.8)	31.8 (31.7, 31.9)	31.6 (31.5, 31.7)	31.3 (31.2, 31.4)	31.4 (31.3, 31.5)	31.6 (31.5, 31.7)

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Notes: The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone. Percentages and 95 percent confidence intervals were rounded to the tenth decimal place at the end of the calculation.

[a]Hispanic or Latina women may be of any race.

Table 39: Percentage of Births by Method of Delivery by Payer for the Delivery, 2016—2021

Percentage of births

Method of delivery	Payer	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Vaginal	Private insurance	66.9 (66.8, 66.9)	66.9 (66.8, 66.9)	67.0 (67.0, 67.1)	67.2 (67.1, 67.2)	67.1 (67.1, 67.2)	66.7 (66.6, 66.8)
Vaginal	Medicaid	68.4 (68.4, 68.5)	68.3 (68.3, 68.4)	68.3 (68.3, 68.4)	68.6 (68.5, 68.6)	68.2 (68.1, 68.2)	68.1 (68.0, 68.1)
Vaginal	Other[a]	70.9 (70.7, 71.1)	70.7 (70.5, 70.9)	70.9 (70.6, 71.1)	71.4 (71.2, 71.7)	71.1 (70.9, 71.4)	70.2 (70.0, 70.5)
Vaginal	Self-pay[b]	75.9 (75.6, 76.1)	75.3 (75.1, 75.5)	75.7 (75.5, 75.9)	76.4 (76.2, 76.6)	78.9 (78.7, 79.1)	80.1 (79.9, 80.3)
C-section	Private insurance	33.1 (33.1, 33.2)	33.1 (33.1, 33.2)	33.0 (32.9, 33.0)	32.8 (32.8, 32.9)	32.9 (32.8, 32.9)	33.3 (33.2, 33.4)
C-section	Medicaid	31.6 (31.5, 31.6)	31.7 (31.6, 31.7)	31.7 (31.6, 31.7)	31.4 (31.4, 31.5)	31.8 (31.8, 31.9)	31.9 (31.9, 32.0)
C-section	Other[a]	29.1 (28.9, 29.3)	29.3 (29.1, 29.5)	29.1 (28.9, 29.4)	28.6 (28.3, 28.8)	28.9 (28.6, 29.1)	29.8 (29.5, 30.0)
C-section	Self-pay[b]	24.1 (23.9, 24.4)	24.7 (24.5, 24.9)	24.3 (24.1, 24.5)	23.6 (23.4, 23.8)	21.1 (20.9, 21.3)	19.9 (19.7, 20.1)

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Notes: The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone. Percentages and 95 percent confidence intervals were rounded to the tenth decimal place at the end of the calculation. Payer is the primary source of payment for the delivery.

[a]Other payers in this data source include other federal and state government programs, such as the Indian Health Service or military health care coverage, and charity care.

[b]Self-pay in this data source means no third-party payer was identified.

Table 40: Percentage of Births by Method of Delivery by Mother's Age, 2016—2021

Percentage of births

Method of delivery	Mother's age	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Vaginal	Under age 20	79.8 (79.6, 79.9)	79.9 (79.7, 80.1)	80.2 (80.1, 80.4)	80.7 (80.5, 80.9)	80.6 (80.4, 80.8)	80.6 (80.4, 80.8)
Vaginal	Age 20 - 24	74.0 (73.9, 74.1)	74.1 (74.0, 74.2)	74.5 (74.4, 74.6)	74.9 (74.8, 75.0)	74.7 (74.6, 74.8)	74.6 (74.5, 74.7)
Vaginal	Age 25 - 34	67.8 (67.7, 67.9)	67.8 (67.8, 67.9)	68.1 (68.0, 68.1)	68.3 (68.3, 68.4)	68.3 (68.2, 68.3)	68.2 (68.1, 68.2)
Vaginal	Age 35 and older	58.2 (58.1, 58.3)	58.3 (58.2, 58.4)	58.4 (58.3, 58.5)	58.7 (58.5, 58.8)	58.9 (58.8, 59.0)	58.7 (58.6, 58.8)

Method of delivery	Mother's age	2016 (confidence intervals)	2017 (confidence intervals)	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
C-section	Under age 20	20.2 (20.1, 20.4)	20.1 (19.9, 20.3)	19.8 (19.6, 19.9)	19.3 (19.1, 19.5)	19.4 (19.2, 19.6)	19.4 (19.2, 19.6)
C-section	Age 20 - 24	26.0 (25.9, 26.1)	25.9 (25.8, 26.0)	25.5 (25.4, 25.6)	25.1 (25.0, 25.2)	25.3 (25.2, 25.4)	25.4 (25.3, 25.5)
C-section	Age 25 - 34	32.2 (32.1, 32.3)	32.2 (32.1, 32.2)	31.9 (31.9, 32.0)	31.7 (31.6, 31.7)	31.7 (31.7, 31.8)	31.8 (31.8, 31.9)
C-section	Age 35 and older	41.8 (41.7, 41.9)	41.7 (41.6, 41.8)	41.6 (41.5, 41.7)	41.3 (41.2, 41.5)	41.1 (41.0, 41.2)	41.3 (41.2, 41.4)

Source: GAO analysis of Centers for Disease Control and Prevention, National Center for Health Statistics data. | GAO-24-106271

Note: The 95 percent confidence intervals are noted in parenthesis and provide information on whether comparisons between years and groups are statistically significant at the 95 percent confidence level. Statistical significance at the 95 percent level means that there is 5 percent probability or less of the differences between values being due to chance alone. Percentages and 95 percent confidence intervals were rounded to the tenth decimal place at the end of the calculation.

Table 41: Estimated Percentage of Respondents Who Reported Selected Person with Them at Delivery, 2020—2021

Estimated percentage of respondents

Person at delivery	2020 (confidence intervals)	2021 (confidence intervals)
Husband or partner	84.9 (83.9, 85.8)	85.6 (84.7, 86.5)
Family or friend	12.1 (11.2, 12.9)	17.6 (16.7, 18.6)
Doula	2.4 (2.0, 2.9)	3.4 (3.0, 3.9)
Other support	1.6 (1.3, 1.9)	2.3 (1.9, 2.7)
Support people not allowed	1.9 (1.5, 2.3)	1.3 (1.0, 1.5)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

Table 42: Estimated Percentage of Respondents Who Reported Selected Person with Them at Delivery by Race and Ethnicity, 2020—2021

Estimated percentage of respondents

Person at delivery	Race and ethnicity	2020 (confidence intervals)	2021 (confidence intervals)
Husband or partner	Not Hispanic or Latina	na	na

Person at delivery	Race and ethnicity	2020 (confidence intervals)	2021 (confidence intervals)
Husband or partner	Asian/Pacific Islander	89.8 (86.8, 92.8)	89.4 (86.6, 92.1)
Husband or partner	Black or African American	73.5 (70.7, 76.3)	73.6 (70.1, 77.0)
Husband or partner	White	89.8 (88.7, 91.0)	90.6 (89.5, 91.7)
Husband or partner	All other races[a]	82.3 (77.5, 87.2)	77.2 (72.4, 82.1)
Husband or partner	Hispanic or Latina[b]	79.6 (77.3, 82.0)	81.5 (79.7, 83.3)
Family or friend	Not Hispanic or Latina	na	na
Family or friend	Asian/Pacific Islander	5.1 (2.9, 7.4)	8.3 (6.0, 10.5)
Family or friend	Black or African American	21.2 (18.7, 23.7)	31.3 (27.6, 35.0)
Family or friend	White	8.9 (7.8, 9.9)	14.4 (13.1, 15.6)
Family or friend	All other races[a]	14.5 (9.9, 19.1)	22.8 (18.1, 27.6)
Family or friend	Hispanic or Latina[b]	14.8 (12.6, 17.0)	18.9 (17.1, 20.8)
Doula	Not Hispanic or Latina	na	na
Doula	Asian/Pacific Islander	1.6 (0.0, 3.5)	2.3 (1.2, 3.4)
Doula	Black or African American	3.1 (1.9, 4.3)	3.2 (1.8, 4.6)
Doula	White	2.3 (1.8, 2.9)	3.9 (3.3, 4.5)
Doula	All other races[a]	2.9 (0.1, 5.6)	2.9 (1.6, 4.2)
Doula	Hispanic or Latina[b]	2.4 (1.5, 3.2)	2.8 (2.1, 3.5)
Other support	Not Hispanic or Latina	na	na
Other support	Asian/Pacific Islander	1.6 (0.2, 2.9)	0.9 (0.2, 1.5)
Other support	Black or African American	2.4 (1.5, 3.3)	4.0 (2.5, 5.5)
Other support	White	1.2 (0.8, 1.6)	1.8 (1.3, 2.4)
Other support	All other races[a]	1.7 (0.4, 3.0)	1.8 (0.5, 3.0)
Other support	Hispanic or Latina[b]	1.9 (1.0, 2.9)	2.9 (2.1, 3.7)

Person at delivery	Race and ethnicity	2020 (confidence intervals)	2021 (confidence intervals)
Support people not allowed	Not Hispanic or Latina	na	na
Support people not allowed	Asian/Pacific Islander	1.8 (0.4, 3.2)	0.9 (0.2, 1.6)
Support people not allowed	Black or African American	3.1 (2.1, 4.1)	2.6 (1.3, 4.0)
Support people not allowed	White	1.2 (0.7, 1.6)	0.4 (0.2, 0.7)
Support people not allowed	All other races[a]	2.5 (0.6, 4.5)	1.7 (0.7, 2.6)
Support people not allowed	Hispanic or Latina[b]	2.8 (1.9, 3.8)	2.4 (1.7, 3.1)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race, according to CDC officials.

[b]Hispanic or Latina women may be of any race.

Table 43: Estimated Percentage of Respondents Who Reported Selected Person with Them at Delivery by Insurance During Pregnancy, 2020—2021

Estimated percentage of respondents

Person at delivery	Insurance during pregnancy	2020 (confidence intervals)	2021 (confidence intervals)
Husband or partner	Private insurance[a]	91.9 (91.0, 92.9)	91.0 (90.1, 91.9)
Husband or partner	Medicaid	76.3 (74.3, 78.2)	77.9 (75.9, 79.9)
Husband or partner	Other[b]	66.3 (53.9, 78.7)	75.5 (64.0, 87.1)
Husband or partner	No insurance[c]	73.2 (65.4, 81.0)	73.4 (65.5, 81.3)

Person at delivery	Insurance during pregnancy	2020 (confidence intervals)	2021 (confidence intervals)
Family or friend	Private insurance[a]	7.5 (6.6, 8.5)	13.0 (12.0, 14.0)
Family or friend	Medicaid	18.6 (16.8, 20.3)	25.1 (23.0, 27.2)
Family or friend	Other[b]	14.7 (5.1, 24.2)	10.2 (4.2, 16.2)
Family or friend	No insurance[c]	12.7 (7.1, 18.3)	17.9 (11.4, 24.4)
Doula	Private insurance[a]	2.4 (1.9, 3.0)	3.9 (3.3, 4.5)
Doula	Medicaid	2.7 (1.9, 3.5)	3.1 (2.3, 3.8)
Doula	Other[b]	0	1.5 (0.0, 4.1)
Doula	No insurance[c]	0.6 (0.0, 1.4)	2.0 (0.6, 3.4)
Other support	Private insurance[a]	0.8 (0.5, 1.0)	1.4 (1.0, 1.8)
Other support	Medicaid	2.5 (1.8, 3.3)	3.2 (2.3, 4.0)
Other support	Other[b]	6.0 (0.0, 12.6)	1.8 (0.0, 4.0)
Other support	No insurance[c]	2.1 (0.0, 4.1)	7.0 (1.3, 12.8)
Support people not allowed	Private insurance[a]	0.9 (0.6, 1.2)	0.7 (0.4, 1.0)
Support people not allowed	Medicaid	3.1 (2.3, 3.9)	2.1 (1.5, 2.7)
Support people not allowed	Other[b]	2.9 (0.0, 6.9)	8.8 (0.0, 19.4)
Support people not allowed	No insurance[c]	1.7 (0.0, 3.5)	1.3 (0.1, 2.5)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. Insurance during pregnancy is the type of insurance respondents reported having for prenatal care. As a result, respondents who reported not having prenatal care are excluded from this section, according to CDC officials. About 1 percent and 2 percent of respondents reported not attending any prenatal visits in 2020 and 2021, respectively.

[a]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[b]Other insurance in this data source includes other state-specific government plans or programs.

[c]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

Table 44: Estimated Percentage of Respondents Who Attended a Postpartum Visit, 2018—2021

Estimated percentage of respondents

na	na	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
Race and ethnicity	Not Hispanic or Latina	na	na	na	na
Race and ethnicity	Asian/Pacific Islander	91.8 (90.1, 93.5)	92.8 (91.2, 94.4)	90.0 (88.2, 91.7)	91.5 (89.9, 93.2)
Race and ethnicity	Black or African American	86.7 (85.3, 88.0)	87.9 (86.6, 89.1)	85.0 (83.7, 86.4)	87.4 (86.0, 88.8)
Race and ethnicity	White	92.9 (92.4, 93.4)	92.9 (92.4, 93.5)	91.1 (90.5, 91.7)	93.3 (92.8, 93.9)
Race and ethnicity	All other races[a]	86.5 (84.5, 88.6)	87.1 (84.5, 89.8)	84.4 (81.9, 86.8)	87.3 (85.0, 89.6)
Race and ethnicity	Hispanic or Latina[b]	86.3 (85.1, 87.4)	86.8 (85.5, 88.2)	82.6 (81.2, 84.0)	86.0 (84.7, 87.3)
Insurance after pregnancy[c]	Private insurance[d]	95.4 (95.0, 95.8)	95.9 (95.4, 96.3)	93.5 (93.0, 93.9)	95.1 (94.6, 95.5)
Insurance after pregnancy[c]	Medicaid	84.8 (83.8, 85.8)	84.8 (83.7, 85.9)	83.3 (82.3, 84.3)	86.3 (85.3, 87.2)
Insurance after pregnancy[c]	Other[e]	86.4 (82.2, 90.5)	84.1 (78.6, 89.6)	72.9 (65.4, 80.5)	86.3 (80.6, 92.1)
Insurance after pregnancy[c]	No insurance[f]	83.5 (81.8, 85.3)	82.1 (80.1, 84.1)	74.7 (71.8, 77.6)	78.5 (75.6, 81.4)
Age	Under age 20	84.7 (82.3, 87.1)	84.7 (81.2, 88.1)	79.5 (76.4, 82.7)	83.8 (80.7, 86.8)
Age	Age 20 - 24	87.3 (86.1, 88.4)	87.4 (86.1, 88.7)	84.9 (83.6, 86.2)	87.1 (85.8, 88.5)
Age	Age 25 - 34	91.6 (91.1, 92.1)	91.5 (90.9, 92.1)	89.2 (88.5, 89.8)	92.1 (91.5, 92.7)
Age	Age 35 and older	92.0 (91.1, 92.9)	92.9 (92.1, 93.7)	89.8 (88.7, 90.9)	91.4 (90.4, 92.4)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that participate in the Pregnancy Risk Assessment Monitoring System survey and had at least a 50 percent response rate. As a result, the states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with "other" as their race, according to CDC officials.

[b]Hispanic or Latina women may be of any race.

[c]Insurance after pregnancy is the type of insurance respondents reported having after pregnancy.

[d]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[e]Other insurance in this data source includes other state-specific government plans or programs.

[f]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

Table 45: Estimated Percentage of Respondents Who Attended Postpartum Visits In-Person, Virtually, or Both during COVID-19 Pandemic by Race and Ethnicity, 2020—2021

Estimated percentage of respondents

Type of visit	Race and ethnicity	2020 (confidence intervals)	2021 (confidence intervals)
In-person only	Not Hispanic or Latina	na	na
In-person only	Asian/Pacific Islander	72.8 (68.3, 77.2)	76.5 (72.6, 80.4)
In-person only	Black or African American	73.6, (70.6, 76.7)	76.3 (73.0, 79.7)
In-person only	White	79.9 (78.5, 81.3)	83.7 (82,4, 84.9)
In-person only	All other races[a]	70.1 (64.1, 76.1)	75.8 (70.8, 80.7)
In-person only	Hispanic or Latina[b]	69.9 (67.2, 72.6)	73.8 (71.6, 75.9)
Both in-person and virtual	Not Hispanic or Latina	na	na
Both in-person and virtual	Asian/Pacific Islander	14.8 (11.5, 18.1)	15.5 (12.0, 19.0)
Both in-person and virtual	Black or African American	11.0 (8.9, 13.2)	12.0 (9.7, 14.3)
Both in-person and virtual	White	10.8 (9.7, 11.8)	9.7 (8.7, 10.6)
Both in-person and virtual	All other races[a]	12.3 (8.3, 16.4)	10.9 (7.1, 14.7)
Both in-person and virtual	Hispanic or Latina[b]	11.6 (9.8, 13.3)	12.2 (10.6, 13.8)
Virtual only	Not Hispanic or Latina	na	na
Virtual only	Asian/Pacific Islander	5.1 (2.7, 7.5)	2.0 (1.0, 2.9)
Virtual only	Black or African American	3.7 (2.3, 5.0)	1.2 (0.4, 1.9)
Virtual only	White	3.3 (2.7, 3.9)	1.9 (1.4, 2.4)
Virtual only	All other races[a]	4.2 (1.8, 6.5)	1.6 (0.5, 2.7)
Virtual only	Hispanic or Latina[b]	4.9 (3.6, 6.1)	2.5 (1.8, 3.2)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. About 9 percent and 8 percent of respondents reported not attending a postpartum visit in 2020 and 2021, respectively.

[a]All other races includes American Indian or Alaska Native women, multiracial women, and those with “other” as their race, according to CDC officials.

[b]Hispanic or Latina women may be of any race.

Table 46: Estimated Percentage of Respondents Who Attended Postpartum Visits In-Person, Virtually, or Both during COVID-19 Pandemic by Insurance after Pregnancy, 2020—2021

Estimated percentage of respondents

Type of visit	Insurance after pregnancy	2020 (confidence intervals)	2021 (confidence intervals)
In-person only	Private insurance[a]	80.3 (78.9, 81.6)	83.1 (81.9, 84.2)
In-person only	Medicaid	72.1 (70.1, 74.2)	76.1 (74.1, 78.1)
In-person only	Other[b]	68.1 (56.2, 79.9)	65.2 (53.9, 76.4)
In-person only	No insurance[c]	63.8 (58.4, 69.2)	70.3 (65.1, 75.7)
Both in-person and virtual	Private insurance[a]	11.4 (10.3, 12.4)	11.2, (10.3, 12.1)
Both in-person and virtual	Medicaid	11.7 (10.3, 13.1)	10.5 (9.1, 12.0)
Both in-person and virtual	Other[b]	10.3 (3.3, 17.3)	17.0 (9.1, 25.0)
Both in-person and virtual	No insurance[c]	8.8 (5.6, 12.0)	9.0 (5.5, 12.4)
Virtual only	Private insurance[a]	4.1 (3.4, 4.8)	1.8 (1.4, 2.3)
Virtual only	Medicaid	3.2 (2.4, 4.0)	2.1 (1.5, 2.8)
Virtual only	Other[b]	4.3 (0.0, 9.1)	5.7 (0.7, 10.7)
Virtual only	No insurance[c]	5.7 (3.2, 8.1)	1.8 (0.5, 3.1)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. About 9 percent and 8 percent of respondents reported not attending a postpartum visit in 2020 and 2021, respectively. Insurance after pregnancy is the type of insurance respondents reported having after pregnancy.

[a]Private insurance in this data source includes private insurance alone or in combination with another insurance, as well as military health care coverage.

[b]Other insurance in this data source includes other state-specific government plans or programs.

[c]No insurance in this data source includes those who report no insurance or only care from the Indian Health Service or Alaska Tribal Health System.

Table 47: Estimated Percentage of Respondents Who Attended Postpartum Visits In-Person, Virtually, or Both during COVID-19 Pandemic by Age, 2020—2021

Estimated percentage of respondents

Type of visit	Age	2020 (confidence intervals)	2021 (confidence intervals)
In person-only	Under age 20	68.6 (61.5, 75.6)	71.4 (64.3, 78.5)
In person-only	Age 20 - 24	74.4 (71.5, 77.4)	78.0 (75.3, 80.8)

Type of visit	Age	2020 (confidence intervals)	2021 (confidence intervals)
In person-only	Age 25 - 34	77.3 (75.9, 78.8)	80.8 (79.5, 82.1)
In person-only	Age 35 and older	75.4 (73.1, 77.8)	79.0 (77.0, 81.1)
Both in-person and virtual	Under age 20	7.2 (3.7, 10.8)	12.8 (7.6, 18.0)
Both in-person and virtual	Age 20 - 24	9.8 (7.9, 11.6)	10.3 (8.2, 12.3)
Both in-person and virtual	Age 25 - 34	11.3 (10.3, 12.3)	10.2 (9.3, 11.1)
Both in-person and virtual	Age 35 and older	13.1 (11.2, 14.9)	13.2 (11.6, 14.8)
Virtual only	Under age 20	5.5 (2.1, 9.0)	1.2 (0.3, 2.2)
Virtual only	Age 20 - 24	3.4 (2.0, 4.7)	1.7 (0.9, 2.4)
Virtual only	Age 25 - 34	3.8 (3.1, 4.4)	2.1 (1.6, 2.6)
Virtual only	Age 35 and older	3.9 (2.9, 4.9)	1.9 (1.3, 2.5)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data. | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that used the Pregnancy Risk Assessment Monitoring System Maternal COVID-19 Experiences questionnaire. All states and jurisdictions are included in the aggregate data and estimated rates, regardless of response rates, according to CDC. The states and jurisdictions included in the data we reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant. About 9 percent and 8 percent of respondents reported not attending a postpartum visit in 2020 and 2021, respectively.

Table 48: Estimated Percentage of Respondents Reporting Selected Reasons for Not Attending a Postpartum Visit, 2018—2021

Estimated percentage of respondents

Reasons for not attending postpartum visit	2018 (confidence intervals)	2019 (confidence intervals)	2020 (confidence intervals)	2021 (confidence intervals)
I didn’t have health insurance to cover the cost of the visit.	22.2 (17.1, 27.3)	19.9 (14.6, 25.3)	11.1 (7.9, 14.4)	11.2 (6.2, 16.2)
I felt fine and did not think I needed to have a visit.	47.3 (41.3, 53.2)	44.4 (37.9, 51.0)	39.2 (34.5, 43.8)	37.6 (30.1, 45.1)
I couldn’t get an appointment when I wanted one.	12.3 (8.5, 16.2)	13.4 (8.8, 18.0)	13.8 (10.5, 17.0)	11.4 (6.4, 16.5)
I didn’t have any transportation to get to the clinic or doctor’s office.	14.1 (10.0, 18.1)	14.6 (9.8, 19.4)	6.3 (4.2, 8.4)	9.9 (5.0, 14.7)
I had too many things going on.	33.3 (27.7, 38.9)	39.1 (32.6, 45.5)	26.2 (22.1, 30.3)	44.1 (36.1, 52.0)
I couldn’t take time off from work.	5.5 (2.8, 8.2)	8.5 (4.6, 12.4)	3.3 (1.7, 4.9)	7.0 (2.1, 11.8)
Other reasons	14.6 (10.8, 18.4)	14.0 (9.4, 18.7)	36.0[a] (31.5, 40.4)	19.9 (13.8, 26.1)

Source: Centers for Disease Control and Prevention (CDC), Pregnancy Risk Assessment Monitoring System survey data | GAO-24-106271

Notes: Estimated percentages are based on aggregate data from respondents in states and jurisdictions that participate in the Pregnancy Risk Assessment Monitoring System survey and had at least a 50 percent response rate. As a result, the states and jurisdictions included in the data we

reviewed vary from year to year, and any observed changes reflect the combined effect of actual changes in the measure and changes in the states and jurisdictions supplying data for a given year. Thus, estimates are not directly comparable across years. The following states used this question in their survey and are included in the aggregate data for years in which the state met the 50 percent response threshold: Arizona (2020), Illinois (all years), Iowa (2018, 2019, 2020), Maryland (2018, 2019, 2020), Utah (all years), Virginia (all years), and Wisconsin (all years). The 95 percent confidence intervals are noted in parenthesis and provide information on the relative precision of an estimate. Non-overlap between confidence intervals suggests that the difference between those estimated values is statistically significant.

[a]According to CDC officials, 26 percent of all respondents who reported "other" reasons for not attending a postpartum visit reported a COVID-19 pandemic-related reason in 2020.

Appendix III: Comments from the Department of Health and Human Services

DEPARTMENT OF HEALTH & HUMAN SERVICES
OFFICE OF THE SECRETARY

Assistant Secretary for Legislation
Washington, DC 20201

January 30, 2024

Alyssa M. Hundrup
Director, Health Care
U.S. Government Accountability Office
441 G Street NW
Washington, DC 20548

Dear Ms. Hundrup:

Attached are comments on the U.S. Government Accountability Office's (GAO) report entitled, **"MATERNAL HEALTH: HHS Should Improve Assessment of Efforts to Address Worsening Outcomes" (GAO-24-106271).**

The Department appreciates the opportunity to review this report prior to publication.

Sincerely,

Melanie Anne Egorin, PhD
Assistant Secretary for Legislation

Attachment

GENERAL COMMENTS OF THE DEPARTMENT OF HEALTH & HUMAN SERVICES ON THE GOVERNMENT ACCOUNTABILITY OFFICE'S DRAFT REPORT ENTITLED – MATERNAL HEALTH: HHS SHOULD IMPROVE ASSESSMENT OF EFFORTS TO ADDRESS WORSENING OUTCOMES (GAO-24-106271)

The U.S. Department of Health and Human Services (HHS) appreciates the opportunity to review and provide comments on the Government Accountability Office's (GAO) draft report. HHS agrees with GAO that the nation faces a maternal health crisis. HHS has undertaken a number of new initiatives to address the crisis which has been exacerbated by the COVID-19 pandemic.

GAO Recommendation 1
The Secretary of HHS should ensure that the Office on Women's Health and Office of the Assistant Secretary for Planning and Evaluation performance strategy includes key performance management practices—including near-term goals with quantitative targets and time frames to define intended results and associated performance measures for the near-term goals—to assess the performance of HHS's maternal health efforts against the Maternal Health Blueprint's goals.

HHS Response
HHS concurs with the recommendation.

The Office of Women's Health and Office of the Assistant Secretary for Planning and Evaluation convene a Department-wide leadership team comprised of agencies that have equities in addressing the maternal health crisis. These offices are preparing a report to Congress that will convey how the Department is addressing some of the key drivers of maternal health outcomes, and provide other programmatic updates on HHS initiatives included in the *White House Blueprint for Addressing the Maternal Health Crisis* (Blueprint) released in June of 2022, and discuss key initiatives that have been launched since release of the Blueprint. The report to Congress will include a maternal health measurement framework on health outcomes, quality of care, and access to care to assess progress in addressing the maternal health crisis. HHS anticipates public release of the report to Congress in Spring 2024.

GAO Recommendation 2
The Director of CDC should ensure that the Perinatal Quality Collaborative program establishes quantitative targets for its near-term goals to provide a basis for comparing planned and actual results.

HHS Response
CDC concurs with this recommendation and is working to establish quantitative targets for the near-term goals included in the Perinatal Quality Collaborative (PQC) program notice of funding opportunity by the end of calendar year 2024. Throughout fiscal years 2022 and2023 Agency Priority Goals process, CDC has included a key performance indicator for overall PQC efforts to "[i]ncrease by 10% the number of hospitals participating in Perinatal Quality Collaboratives engaged in data-informed quality improvement efforts to address the drivers of maternal

mortality and achieve equity." More information on how HHS is achieving goal five and progress on key PQC performance measurement practices can be found on Performance.gov.[1]

[1] https://www.performance.gov/agencies/hhs/apg/goal-5

Accessible Text for Appendix III: Comments from the Department of Health and Human Services

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Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Alyssa M. Hundrup, (202) 512-7114 or hundrupa@gao.gov

Staff Acknowledgments

In addition to the contact named above, Karen Doran (Assistant Director), Erika Huber (Analyst-in-Charge), Naomi Joswiak, Mallory Kennedy, Cynthia Khan, Drew Long, Jenna Moody, Jeanne Murphy-Stone, Eric Peterson, Raquel Qualls-Hampton, and Sirin Yaemsiri made key contributions to this report. Also contributing were Ashley Ganesh, Ben Licht, Jennifer Rudisill, and Ethiene Salgado-Rodriguez.

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