



OKLAHOMA
State Department
of Health

OKLAHOMA
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HEALTH
TASK FORCE



Oklahoma Maternal Health

Morbidity & Mortality

Annual Report 2024



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Executive Summary

Women’s Health

Women of reproductive age and mothers in Oklahoma face unique challenges in seeking, accessing, and utilizing health care. Compared with other states and the United States overall, women of reproductive age in Oklahoma are more likely to have reduced access to health care, higher rates of poverty and being uninsured, and higher likelihood of living in a maternity care desert (counties with no facilities offering obstetric care, no obstetric care providers, and any proportion of women 18-64 without health insurance).¹⁻⁴

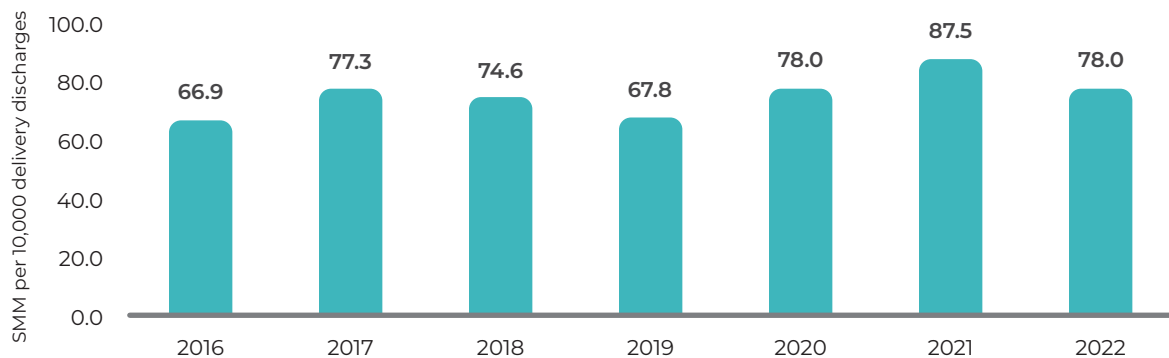
In 2021, Oklahoma’s Medicaid program, SoonerCare, expanded the income threshold for eligibility for adults 19-64 to 138% (133% with a 5% disregard) of the federal poverty level or lower, which resulted in over 300,000 Oklahomans enrolled through the expansion by June 2022.⁵ Additionally, in 2023 SoonerCare extended postpartum coverage from 60 days to 12 months and expanded income eligibility for pregnant members from 133% to 185%, equivalent to 210% of the federal poverty level after conversion to Modified Adjusted Gross Income methodology (205% with a 5% disregard).⁶ While these expansions provide further coverage for women of reproductive age and pregnant/postpartum women, care availability, transportation, and financial challenges may still impact access to and utilization of preconception, prenatal, and postpartum health care.

Severe Maternal Morbidity (SMM)

After substantially increasing from 2020 to 2021, the rate of severe maternal morbidity (SMM) excluding blood transfusions decreased in 2022 (Chart ES-1, [Chart 2]).

The five most common indicators of SMM in 2022 were acute renal failure, hysterectomy, disseminated intravascular coagulation (DIC), acute respiratory distress syndrome (ARDS), and pulmonary edema. From 2020 – 2022, there were disparities in the rate and most common indicators of SMM observed for both maternal race and age. By race (Hispanic origin information is not available for SMM data), Black/African American and American Indian/Alaska Native women had higher rates of SMM compared with White women. By age group, the rate of SMM was lowest for those 20 – 24. Rates of SMM increased with increasing age, with those 40 years of age or older having the highest rates of SMM.

Chart ES-1 (Chart 2): Rate of severe maternal morbidity (SMM) excluding transfusions per 10,000 delivery discharges, Oklahoma 2016 - 2022



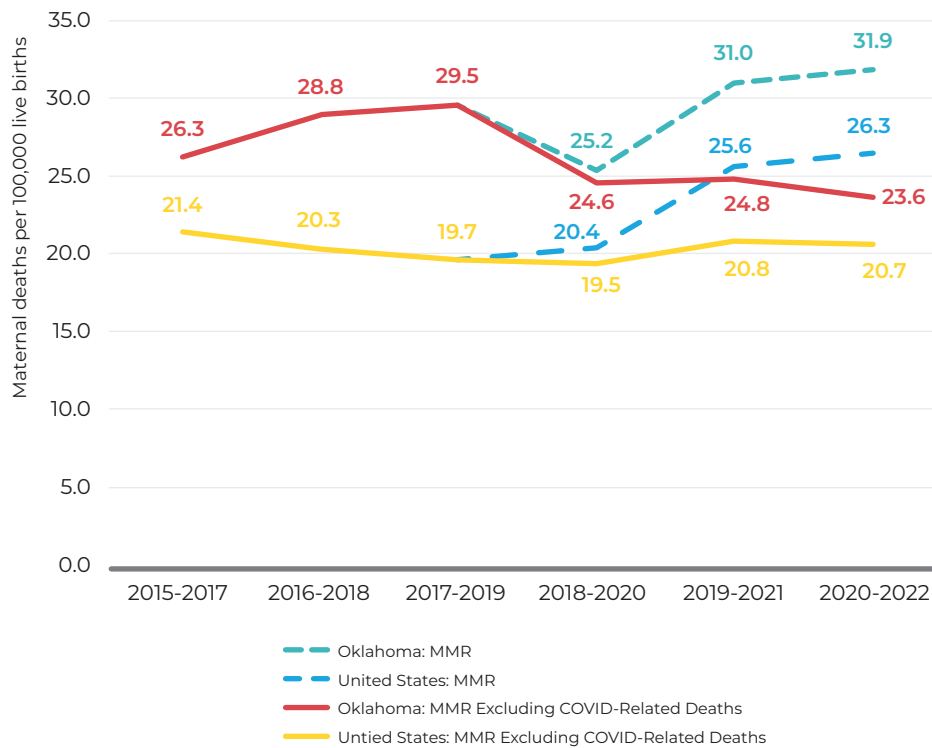
Source: Oklahoma State Department of Health, Center for Health Statistics, Oklahoma Hospital Discharge Data 2016 - 2022

Maternal Mortality

Maternal mortality increased substantially in 2021, both nationally and in Oklahoma, likely in part due to the effects of the COVID-19 pandemic. Approximately one-fifth of maternal deaths in the United States from 2020 – 2022 were related to COVID-19⁷⁻⁹, and about a quarter of Oklahoma maternal deaths from 2020 – 2022 were related to COVID-19. The national maternal mortality rate (MMR) decreased from 2021 to 2022 by 32.2% and disparities in maternal mortality due to race and age persisted, with Non-Hispanic Black mothers and mothers 40 years of age or older at increased risk of maternal mortality.¹⁰

While the single-year maternal mortality rate in Oklahoma decreased from 2021 to 2022, the three-year rolling maternal mortality rate remains elevated due to the inclusion of the increased mortality observed in 2021. With the rolling three-year maternal mortality rate, the MMR for both the United States overall and Oklahoma increased slightly from 2019 – 2021 to 2020 – 2022, each by approximately 3%. (Chart ES-2, [Chart 8]). Excluding COVID-related maternal deaths (maternal deaths with COVID-19 listed as any multiple cause of death, by code U07.1), the maternal mortality rate decreased by 0.5% nationally and by 4.8% in Oklahoma.

Chart ES-2 (Chart 8): three-year rolling maternal mortality rate (MMR) excluding and including COVID-related deaths, Oklahoma and United States 2015 - 2022



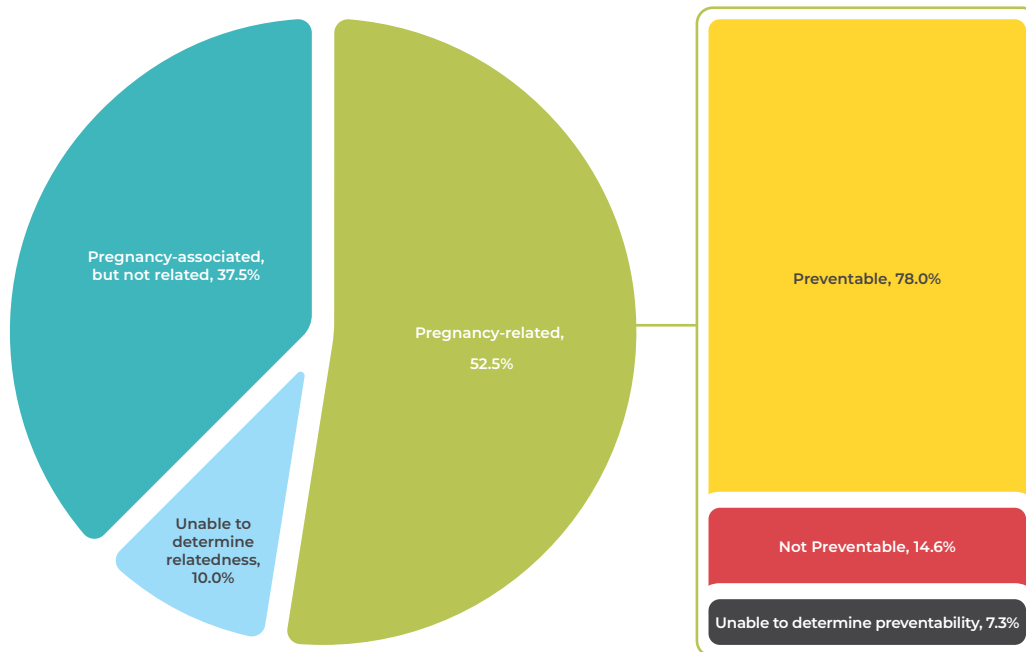
Source: Oklahoma Vital Statistics, 2015 - 2022; CDC Wonder, Mortality and Natality, 2015 - 2022

Definitions: Maternal death - underlying cause of death A34, O00-O95, O98-O99; COVID-related death - any multiple cause of death U07.1

Maternal Mortality Review Committee

The Oklahoma Maternal Mortality Review Committee (MMRC) reviewed 80 deaths occurring during pregnancy or within one year of termination of pregnancy, with dates of death from 2017 – 2021. Of these deaths, 52.5% were determined to be pregnancy-related: a death caused by a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy (Chart ES-3, [Chart 11]). Of these pregnancy-related deaths, nearly 80% were determined to have been preventable, and the majority occurred 1 to 365 days after delivery or termination of pregnancy. Among pregnancy-related deaths with an MMRC determination of cause of death, the top causes of pregnancy-related deaths were hemorrhage, infection, and cardiac conditions. Among these top three causes of death, the majority (ranging from 70.0 – 100.0%) were determined to have been preventable.

Chart ES-3 (Chart 11): Relatedness of pregnancy-associated deaths and preventability of pregnancy-related deaths*, Oklahoma 2017 - 2021



Source: Oklahoma Maternal Mortality Review Committee (MMRC), 2017 - 2021

*With an MMRC determination of preventability

Several contributing factors were noted for pregnancy-related deaths from 2017 – 2021, including substance use disorders, patient adherence to recommendations (limited prenatal care and being unvaccinated for influenza or COVID-19), chronic conditions, delays in seeking care (e.g., lack of access or financial resources, religious or cultural factors, stigma), mismanagement of care, delay in treatment, and poor continuity of care.

In the process of reviewing pregnancy-associated deaths, the MMRC assesses the contributing factors of deaths determined to be both pregnancy-related and preventable, from which it generates actionable recommendations to work toward reducing maternal morbidity and mortality in Oklahoma. Recommendations generated from 2022 to 2024 include addressing and reducing the prevalence of chronic conditions that increase risk of morbidity and mortality, increasing the adoption of recommended guidelines for pregnancy and postpartum care, addressing gaps in provider knowledge on obstetric complications, improving the safety and quality of prenatal and postpartum care, advocating for legislation to reduce maternal deaths, and reducing health inequities.

The Oklahoma State Department of Health (OSDH), along with governmental and nongovernmental partners such as the Oklahoma Perinatal Quality Improvement Collaborative (OPQIC), the Oklahoma Hospital Association (OHA), the Oklahoma Health Care Authority (OHCA), the Oklahoma Department of Mental Health and Substance Abuse Services (ODMHSAS), and the Southern Plains Tribal Health Board (SPTHB), among others, are actively engaged in several activities to put the MMRC recommendations into action throughout Oklahoma. These efforts have included:

- Raising awareness on maternal health topics through social media campaigns, toolkits, and trainings.
- Improving patient care and safety through the implementation of maternal health initiatives, trainings, and patient safety bundles.
- Increasing access to care through direct care programs and the expansion of SoonerCare coverage for pregnant enrollees.
- Improving data collection for MMRC reviews through the introduction and passing of legislation to increase the likelihood of autopsy referral and report for maternal deaths.

Women's Health Overview: Oklahoma

Women of reproductive age in Oklahoma have higher rates of being uninsured, experiencing poverty, and living in a maternity care desert compared to other states, and the United States as a whole.¹⁻³

Per 2021 Census data, Oklahoma had the second highest rate in the United States of women 19 – 44 not covered by private or public insurance, at 20.5%.² Notably, over half of births in Oklahoma in 2021 (57.0%) were covered by SoonerCare (Oklahoma's Medicaid program).¹¹ In recent years, there have been significant updates to SoonerCare benefits to increase insurance coverage and access to care for Oklahomans in need, specifically for those who are pregnant. In 2021, SoonerCare expanded the income threshold for eligibility for adults 19 – 64 to 138% (133% with a 5% disregard) of the federal poverty level or lower, which resulted in over 300,000 Oklahomans enrolled through the expansion by June 2022.⁵ Additionally, in 2023 SoonerCare extended postpartum coverage from 60 days to 12 months and expanded income eligibility for pregnant members from 133% to 185%, equivalent to 210% of the federal poverty level after conversion to Modified Adjusted Gross Income methodology (205% with a 5% disregard).⁶ The expansion and extension of pregnancy and postpartum SoonerCare benefits can reduce insurance coverage disruption and improve health care access and utilization for mothers in need.

However, there are additional factors which may affect health care access and utilization for women of reproductive age and those who are pregnant or postpartum. Maternity care deserts are defined by the March of Dimes as counties with no facilities offering obstetric care, no obstetric care providers, and any proportion of women 18 – 64 without health insurance. Per the 2023 March of Dimes report, over half of Oklahoma counties are defined as maternity care deserts, compared with about a third of counties in the U.S.¹ Further, on average, Oklahoma women living in maternity care deserts were 29.9 miles away from maternity care, traveling 4.5 times farther than those living in areas with full access. Compared with other states, Oklahoma ranked 44th both for women between the ages of 15 – 44 living in a maternity care desert (13.5%, compared to 3.1% nationally) and women 18 – 44 living below the poverty level (19.7%, compared to 15.5% nationally), and ranked 47th for the number of obstetricians, gynecologists, and midwives per 100,000 females ages 15 and older (33.1, compared to 46.0 nationally).²⁻⁴ Therefore, barriers to the utilization of prenatal and postpartum care may persist, despite increased access to insurance coverage.

Per the Oklahoma Behavioral Risk Factor Surveillance System (BRFSS), chronic conditions and reduced access to care are prevalent among women of reproductive age in Oklahoma, which may increase the risk of maternal morbidity and mortality.¹² Among women aged 18 to 44 years in Oklahoma during 2022, 16.8% reported their health status as fair or poor and 23.3% felt that within the past year, a doctor visit was too costly to be able to attend. Approximately 4.7% of women aged 18 – 44 reported ever receiving a diabetes diagnosis, and 3.3% reported gestational diabetes. Among women of reproductive age with known body mass index (BMI), 70.1% were considered to be overweight or obese. Smoking also continues to be a public health concern: among women in this age group, 15.2% were a current smoker, 10.5% smoking daily, and 18.4% were a former smoker. Among births in Oklahoma in 2022, per Oklahoma vital statistics, 1.0% reported pre-pregnancy diabetes, 6.7% reported gestational diabetes, 3.3% reported pre-pregnancy hypertension, 8.8% reported gestational hypertension, and 61.8% were overweight or obese based on their pre-pregnancy weight.

Postpartum Visits

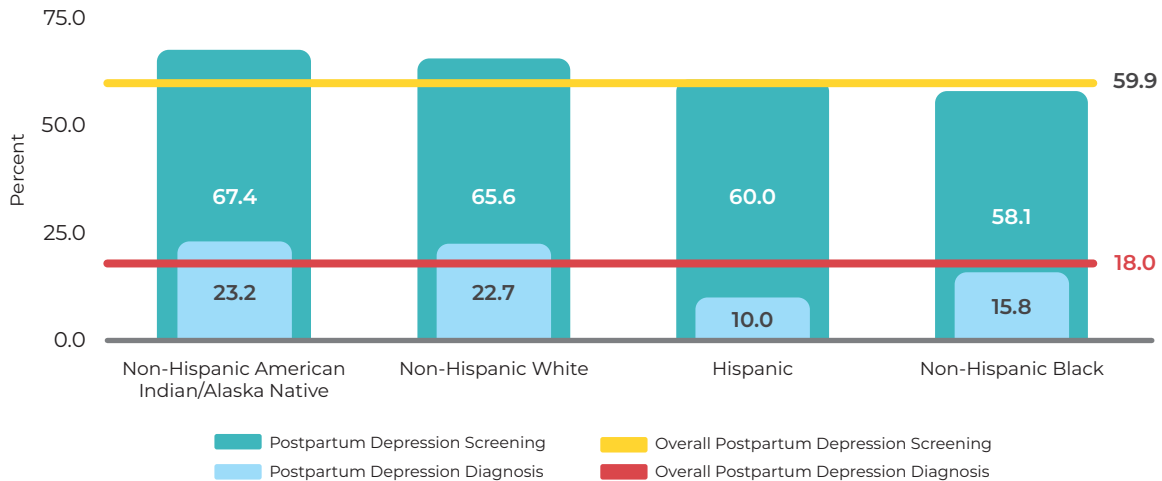
According to recent Pregnancy Risk Assessment Monitoring System (PRAMS) data (2022), 86.8% of new mothers in Oklahoma attended their postpartum visit.¹³ Non-Hispanic White mothers reported the highest postpartum visit rate at 89.5%, compared with 88.4% of Non-Hispanic American Indian mothers, 81.5% of Non-Hispanic Black mothers, and 81.4% of Hispanic mothers.

Postpartum Depression

According to the Centers for Disease Control and Prevention (CDC), postpartum depression (PPD) occurs in an estimated 1 in 8 women that give birth every year.¹⁴ The onset of depressive, sad, or pessimistic feelings that may interfere with daily activities usually occurs during the six months after giving birth, but onset of symptoms can happen up to one year postpartum. According to the national 2021 PRAMS data, 12.7% of women nationally experienced depressive symptoms or feelings of hopelessness following pregnancy and delivery¹⁵, compared with 14.9% of women in Oklahoma in 2022.

According to the most recent data (2018 – 2022) from The Oklahoma Toddler Survey (TOTS), 59.9% of new mothers were screened for PPD and 18.0% of mothers were diagnosed with PPD (Chart 1).¹⁶ Non-Hispanic American Indian/Alaska Native mothers had the highest prevalence of PPD screening at 67.4%, followed by Non-Hispanic White mothers, Hispanic mothers, and Non-Hispanic Black mothers. Non-Hispanic American Indian/Alaska Native mothers also reported the highest prevalence of PPD diagnosis at 23.2%, followed by Non-Hispanic White mothers, Non-Hispanic Black mothers, and Hispanic mothers.

Chart 1: Postpartum depression screening and diagnosis by race/Hispanic origin, Oklahoma 2018 - 2022



Source: Oklahoma State Department of Health, The Oklahoma Toddler Survey (TOTS) 2018 - 2022

Severe Maternal Morbidity (SMM)

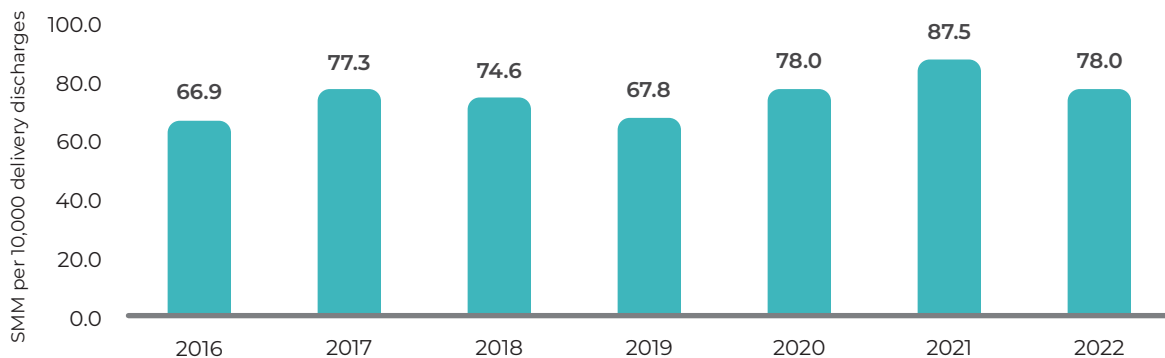
The Alliance for Innovation on Maternal Health (AIM) provides support to states to improve work being done toward the goal of reducing SMM and maternal mortality. Both the CDC and Oklahoma utilize an SMM definition from AIM, characterized by identifying in-hospital deliveries where a mother develops severe complications during labor and delivery based on a list of 21 indicators that correspond to applicable International Statistical Classification of Diseases (ICD) codes (20 excluding blood transfusions).¹⁷ Blood transfusion codes are excluded in the working definition of SMM for this report. Rates for SMM are reported as in-patient delivery discharges with any SMM indicator per 10,000 in-patient delivery discharges.

Of note, only state-licensed facilities contribute to the collection of SMM data in Oklahoma, therefore there are limitations to the process of analyzing hospital discharge data to capture all of Oklahoma's potential SMM cases. Deliveries that occur outside of acute care hospitals (e.g., home births, birthing centers, facilities not licensed by the state) are not included in the inpatient discharge data from which SMM rates are calculated. Specifically, some hospitals operated by tribal entities are not subject to state regulation, and so may be excluded from SMM analyses. Therefore, SMM metrics for American Indian/Alaska Native persons may be underestimated.

According to the most recent data available from the Health care Cost and Utilization Project (HCUP), SMM rates have continued to increase nationally, affecting approximately 27,000 women annually in the last decade and over 30,000 women in 2020.¹⁸ SMM rates increased by 26.4% from 69.8 per 10,000 in-hospital deliveries in 2011 to 88.2 in 2020, and by 10.7% from 2019 to 2020.

In Oklahoma, after substantially increasing in 2021, the rate of SMM excluding transfusions decreased from 87.5 per 10,000 in-patient delivery discharges to 78.0 in 2022 (Chart 2). This 2022 rate represents a 10.9% decrease from 2021.

Chart 2: Rate of severe maternal morbidity (SMM) excluding transfusions per 10,000 delivery discharges, Oklahoma 2016 - 2022

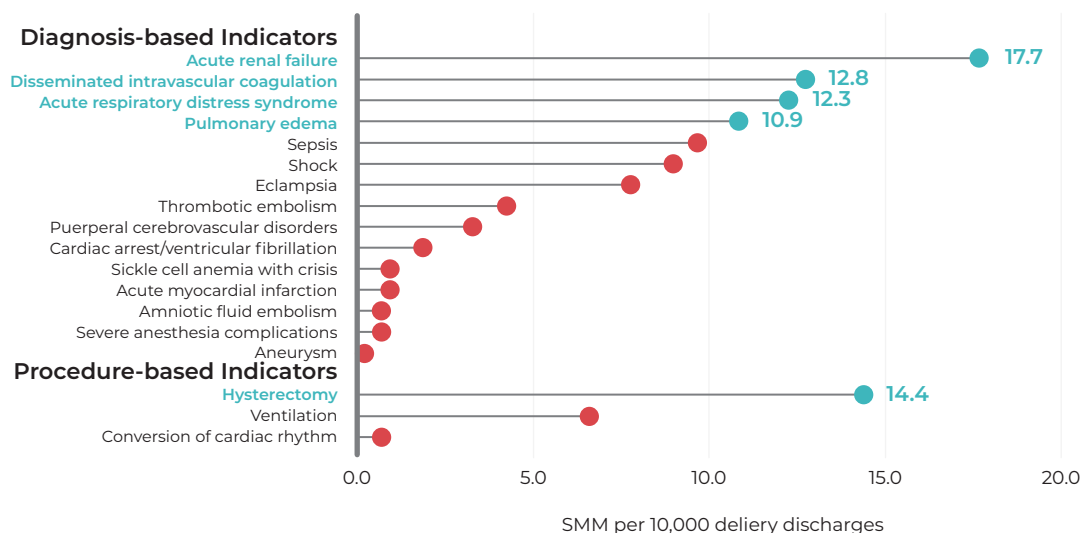


Source: Oklahoma State Department of Health, Center for Health Statistics, Oklahoma Hospital Discharge Data 2016 - 2022

In Oklahoma in 2022, blood transfusions continued to be the most common indicator of SMM, present in 1.7% of inpatient delivery discharges. The rate of blood transfusions has increased substantially from 2020 to 2022, by over 80%. However, the rate of common conditions and procedures co-occurring with blood transfusions, such as hemorrhagic complications (disseminated intravascular coagulation, shock, and hysterectomy), cesarean sections, and anemia, have not similarly increased. It is possible administrative changes in the coding of blood transfusions have contributed to the rate increase, however further investigation is needed, and therefore blood transfusions are excluded from the SMM estimates in this report.

The five most common indicators of SMM in 2022 were acute renal failure, hysterectomy, disseminated intravascular coagulation (DIC), acute respiratory distress syndrome (ARDS), and pulmonary edema (Chart 3).

Chart 3: Rates of severe maternal morbidity (SMM) by indicator (top five causes excluding blood transfusion), Oklahoma 2022



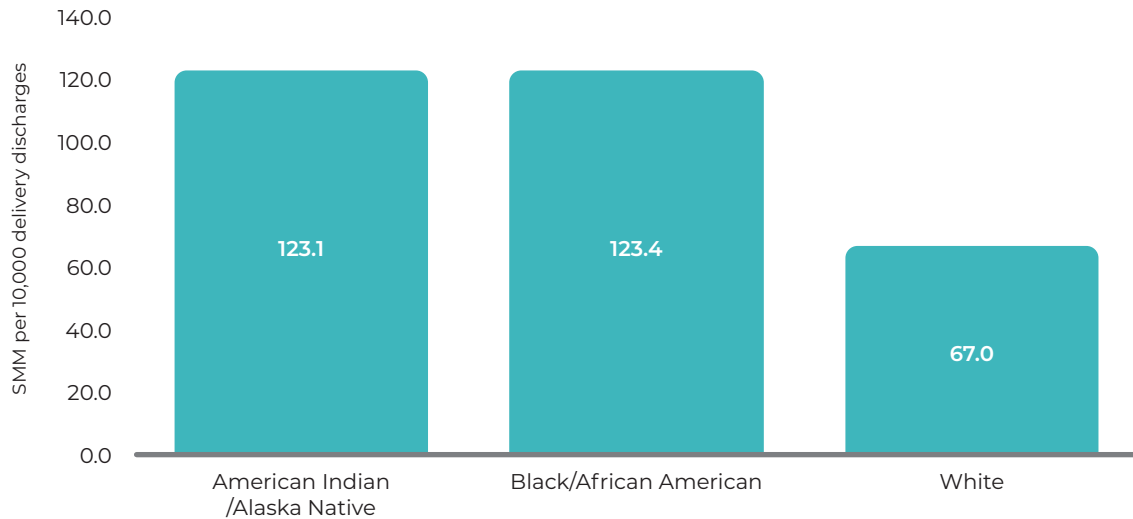
Source: Oklahoma State Department of Health, Center for Health Statistics, Oklahoma Hospital Discharge Data 2022

Rates of acute renal failure steadily increased from 2020 to 2022, along with rates of shock, increasing by 23.9% and 54.4%, respectively. Comparatively, DIC and sepsis steadily decreased from 2020 to 2022, decreasing by 20.2% and 26.0% respectively. Overall SMM excluding transfusions, ARDS, and ventilation all substantially increased from 2020 to 2021, while similarly decreasing from 2021 to 2022. These trends are likely in part due to effects of the COVID-19 pandemic, and specifically surges in 2021. About 25% of discharges with SMM (excluding transfusions) in 2021 co-occurred with a COVID-19 diagnosis, compared with about 8% in 2020 and 2022. Similarly, approximately 60% of discharges with ARDS and ventilation co-occurred with a COVID-19 diagnosis in 2021, compared with approximately 20% in 2020 and 2022.

Race

Additionally, severe maternal morbidity varied by race in Oklahoma from 2020 – 2022 (Chart 4). White women had the lowest rates of SMM, while the rates of SMM for American Indian/Alaska Native and Black/African American women were about 1.8 times higher. Hispanic origin was not available in the data source for SMM.

Chart 4: Severe maternal morbidity (SMM) excluding transfusions per 10,000 delivery discharges by race*, Oklahoma 2020 - 2022



Source: Oklahoma State Department of Health, Center for Health Statistics, Oklahoma Hospital Discharge Data 2020 - 2022

*Hispanic origin information unavailable

The leading causes of SMM also varied by race (Table 1). ARDS was the leading cause of SMM overall and for all race groups except for Black/African American women, for whom acute renal failure was the top cause of SMM. Of note, ARDS and acute renal failure were tied for the top cause of SMM for American Indian/Alaska Native women. ARDS and acute renal failure were in the top five causes for all racial subgroups, and additionally DIC, hysterectomy, and sepsis were in the top five for two of the three racial subgroups. Eclampsia and ventilation were only in the top five for American Indian/Alaska Native women, while pulmonary edema/acute heart failure was only in the top five for Black/African American women.

Table 1: Top causes of severe maternal morbidity (SMM) by race, Oklahoma 2020 - 2022

Rank	Black/ African American	American Indian/ Alaska Native	White	Overall (Includes Other Race)
1	ARF	ARF (tie)	ARDS	ARDS
2	ARDS	ARDS (tie)	DIC	ARF
3	DIC	Eclampsia	ARF	DIC
4	PE/AHF	Hysterectomy	Hysterectomy	Hysterectomy
5	Sepsis	Ventilation	Sepsis	Sepsis

Abbreviations: ARDS = Acute Respiratory Distress Syndrome, ARF = Acute Renal Failure, DIC = Disseminated Intravascular Coagulation, PE/AHF = Pulmonary Edema/Acute Heart Failure

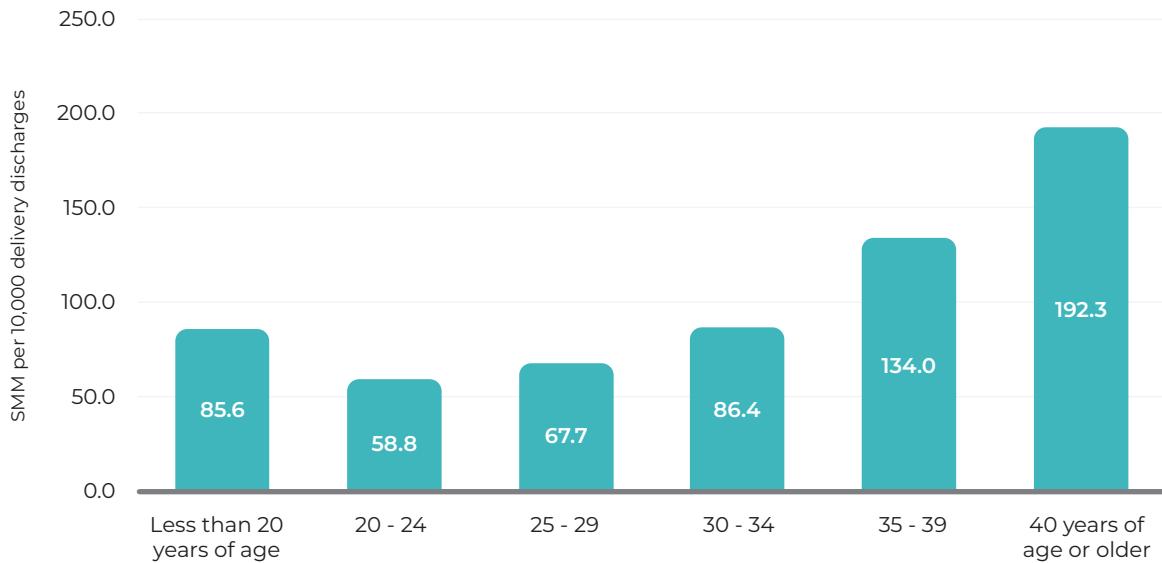
NOTE: Oklahoma utilizes the [Alliance for Innovation on Maternal Health \(AIM\) definition of severe maternal morbidity](#).

Source: Oklahoma State Department of Health, Health Care Information, Oklahoma Hospital Discharge Data, 2020-2022

Age

Severe maternal morbidity also varied by age (Chart 5). From 2020 – 2022, women in Oklahoma between the ages of 20 and 24 had the lowest rate of SMM at 58.8 per 10,000 inpatient delivery discharges. The rate of SMM increased with maternal age above the age of 25, with women 40 years of age and older having an SMM rate over three times higher than that of women 20 – 24. Mothers under the age of 20 also had an increased rate of SMM, with a rate 1.5 times higher than that for women 20 – 24.

Chart 5: Severe maternal morbidity (SMM) excluding transfusions per 10,000 delivery discharges by age, Oklahoma 2020 - 2022



Source: Oklahoma State Department of Health, Center for Health Statistics, Oklahoma Hospital Discharge Data 2020 - 2022

The leading causes of SMM varied by age group as well (Table 2). From 2020 – 2022 in Oklahoma, ARDS was the leading cause of SMM for every age group apart from those under the age of 20, for whom the leading cause was eclampsia. ARDS, acute renal failure, and sepsis were in the top five causes for every age group. Eclampsia and sepsis were in the top causes of SMM for those under the age of 25, while pulmonary edema and hysterectomy were in the top causes for those 25 years of age and older. Further, as maternal age increased, DIC declined in ranking, while hysterectomy rose in ranking.

Table 2: Top causes of severe maternal morbidity (SMM) by age, Oklahoma 2020 - 2022

Rank	<20	20 - 24	25 - 29	30 - 34	35 - 39	40+
1	Eclampsia	ARDS	ARDS	ARDS	ARDS	ARDS
2	DIC	Sepsis	ARF	ARF	Hysterectomy	Hysterectomy
3	ARDS (tie)	DIC (tie)	DIC	Hysterectomy	ARF	ARF
4	ARF (tie)	ARF (tie)	Hysterectomy	DIC	DIC (tie)	PE/AHF
5	Sepsis (tie)	Eclampsia	PE/AHF	PE/AHF	PE/AHF (tie)	Ventilation

Abbreviations: ARDS = Acute Respiratory Distress Syndrome, ARF = Acute Renal Failure, DIC = Disseminated Intravascular Coagulation, PE/AHF = Pulmonary Edema/Acute Heart Failure

NOTE: Oklahoma utilizes the [Alliance for Innovation on Maternal Health \(AIM\) definition of severe maternal morbidity](#).

Source: Oklahoma State Department of Health, Center for Health Statistics, Oklahoma Hospital Discharge Data, 2020 - 2022

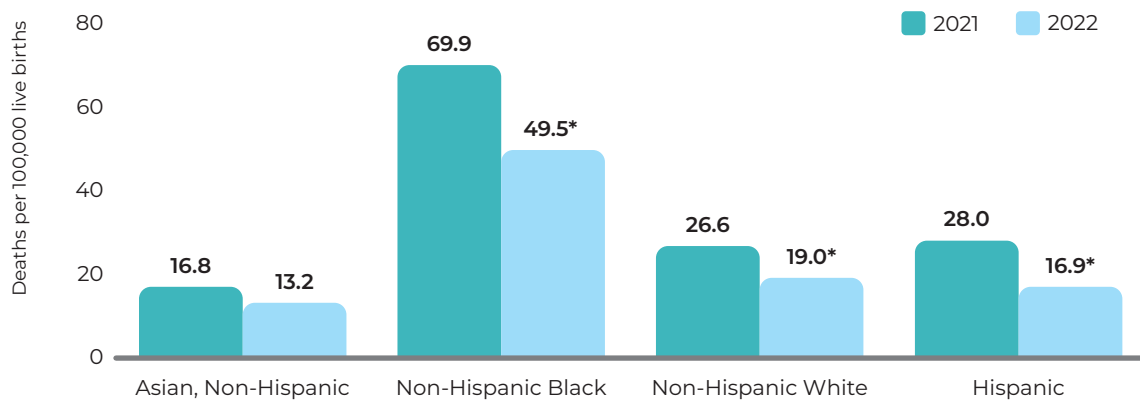
Maternal Mortality

Summary of National Data

A maternal death is defined by the World Health Organization (WHO) as the death of a woman “from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy”.¹⁹

Maternal mortality rates are defined as the number of maternal deaths per 100,000 live births. The CDC estimates for 2022 show that the U.S. had a statistically significant decrease in maternal mortality with 22.3 maternal deaths per 100,000 live births, compared with 32.9 reported in 2021 (Chart 6, adapted from *Maternal Mortality Rates in the United States, 2022*).¹⁰ All race/Hispanic origin groups experienced a statistically significant rate decrease in maternal mortality since 2021, apart from Non-Hispanic Asian. Health equity continues to be of concern, with a persistent widening disparity of maternal mortality rates between race/Hispanic origin groups. In 2022, Non-Hispanic Black women had a significantly higher maternal mortality rate than all other groups, by approximately two to four times. National maternal mortality rates for Non-Hispanic American Indian/Alaska Native women and other races were not available.

Chart 6: Maternal mortality rate, by race and Hispanic origin: United States, 2021 and 2022



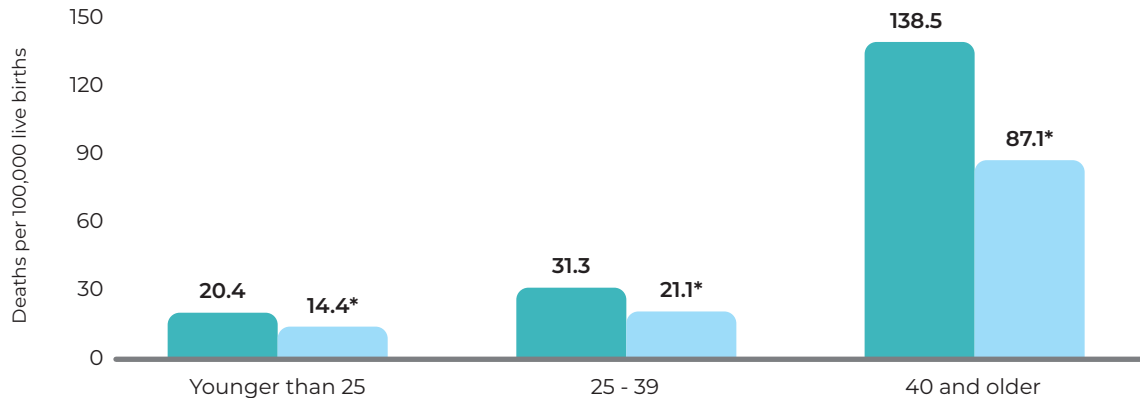
Source: Maternal Mortality Rates in the United States, 2022, National Center for Health Statistics

Definitions: Maternal death - underlying cause of death A34, O00-O95, O98-O99

*Statistically significant decrease from previous year ($p < 0.05$)

From 2021 to 2022, maternal mortality rates decreased significantly in every age group, by about 35% (Chart 7, adapted from *Maternal Mortality Rates in the United States, 2022*). Women 40 years of age and older again had the highest maternal mortality rate, which decreased from 138.5 in 2021 to 87.1 deaths per 100,000 live births in 2022. The 2022 maternal mortality rate for women 40 years of age or older was significantly higher than women under 25 (by 6.0 times) and women 25 - 39 (by 4.1 times).

Chart 7: Maternal mortality rate, by age group: United States, 2021 and 2022



Source: Maternal Mortality Rates in the United States, 2022, National Center for Health Statistics

Definitions: Maternal death - underlying cause of death A34, O00-O95, O98-O99

*Statistically significant decrease from previous year ($p < 0.05$)

Oklahoma Maternal Mortality

Definitions and Methodology

The Oklahoma definitions for maternal death and maternal-related conditions are adapted from the definitions of the WHO and the National Center for Health Statistics (NCHS) within the CDC.^{10,19} Both organizations define a maternal death as “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”. To compute national estimates of maternal deaths, the NCHS uses data from the National Vital Statistics System (NVSS) and “does not include all deaths occurring to pregnant or recently pregnant women, but only those deaths with the underlying cause of death assigned to ICD codes A34, O00–O95, and O98–O99”. Oklahoma’s definition of a maternal-related condition is consistent with these ICD codes.

- **Maternal Death:** The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.
- **COVID-Related Maternal Death:** A maternal death where any multiple cause of death field included ICD code U07.1 (COVID-19).
- **Maternal Mortality Ratio (MMR):** The number of maternal deaths per 100,000 live births. Also referred to as maternal mortality rate.
- **Maternal-Related Condition:** A condition assigned to code numbers A34, O00–O95, and O98–O99 of the International Classification of Diseases, 10th Revision.

For consistency with the national maternal mortality estimates from NCHS, Oklahoma computes maternal mortality estimates from vital statistics. To identify maternal deaths for reporting a statewide maternal mortality rate, Oklahoma selects all death certificates of individuals where:

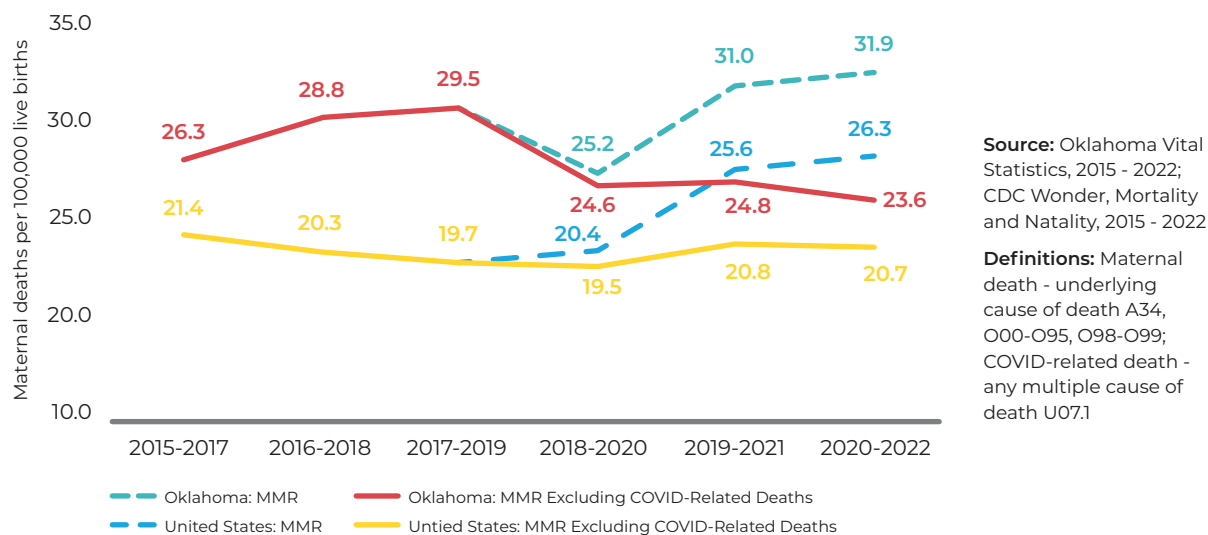
- The state of maternal residence is Oklahoma *and*
- Age at time of death is between 10 and 59 *and*
- The underlying cause of death contains a maternal-related condition *and*
- The pregnancy checkbox indicates that the death occurred while pregnant, within 42 days of pregnancy termination, or pregnancy status is unknown *and*
- The manner of death was not determined to be an accident, suicide, or homicide.

Maternal Mortality Rate

For rate stability, a three-year average is used for reporting maternal mortality in Oklahoma, based on low numbers of maternal deaths each year. After notably increasing in 2019 – 2021 due to the impact of the 2021 increase in maternal deaths, the MMR slightly increased from 31.0 in the 2019 – 2021 time period to 31.9 in the 2020 – 2022 time period. While the single-year maternal mortality rate in Oklahoma decreased from 2021 to 2022, the three-year rolling maternal mortality rate remains, and likely will remain, elevated due to the inclusion of the increased mortality observed in 2021. The 2021 increase follows a similar trend to the national MMR, likely in part due to the effects of the COVID-19 pandemic.

Observing a rolling three-year maternal mortality rate, the MMR for both the United States overall and Oklahoma increased slightly from 2019 – 2021 to 2020 – 2022, each by approximately 3% (Chart 8). Excluding COVID-related maternal deaths, the maternal mortality rate decreased by 0.5% nationally and by 4.8% in Oklahoma. From 2020 – 2022, COVID-related maternal deaths made up about one-fifth of maternal deaths nationally and a quarter of maternal deaths in Oklahoma.

Chart 8: three-year rolling maternal mortality rate (MMR) excluding and including COVID-related deaths, Oklahoma and United States 2015 - 2022

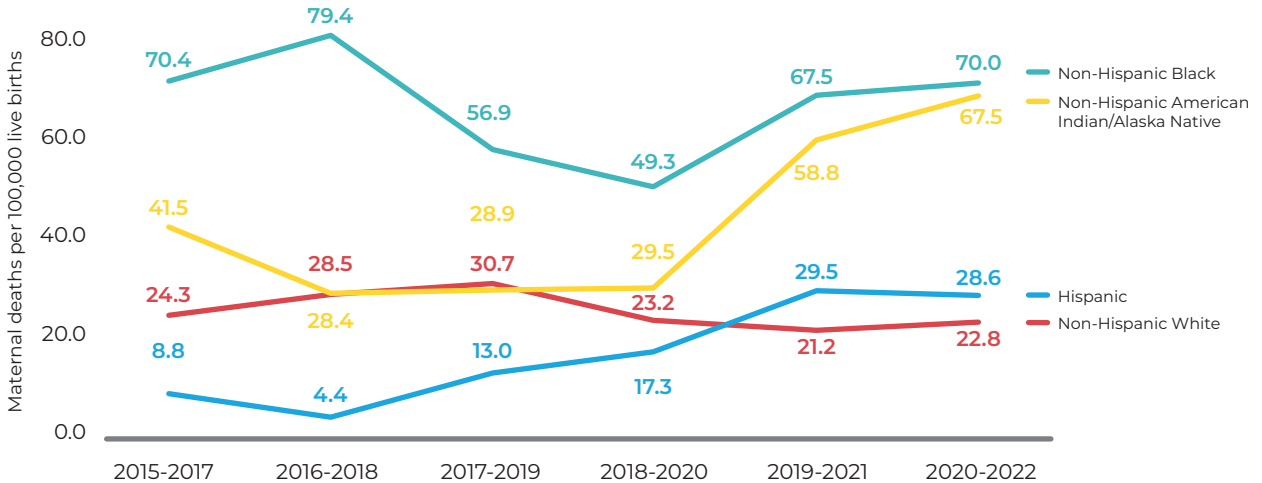


Demographic Characteristics

Maternal Mortality Rate by Race/Hispanic Origin

The MMR increased in every race/Hispanic origin group in 2020 – 2022, apart from Hispanic women, for whom the rate decreased by 3.1% (Chart 9). Non-Hispanic White women had the lowest MMR, at 22.8 deaths per 100,000 live births. MMRs among Non-Hispanic Black, Non-Hispanic White, and Non-Hispanic American Indian/Alaska Native (AIAN) women each increased, by 3.7%, 7.5%, and 14.8% respectively. Disparities in maternal mortality persisted and worsened for Non-Hispanic Black and Non-Hispanic AIAN women: from 2020 – 2022, the MMRs for each were about three times higher than the rate for Non-Hispanic White women.

Chart 9: three-year rolling maternal mortality rate by race/Hispanic origin, Oklahoma 2015 - 2022



Source: Oklahoma Vital Statistics, 2015 - 2022

Definitions: Maternal death - underlying cause of death A34, O00-O95, O98-O99

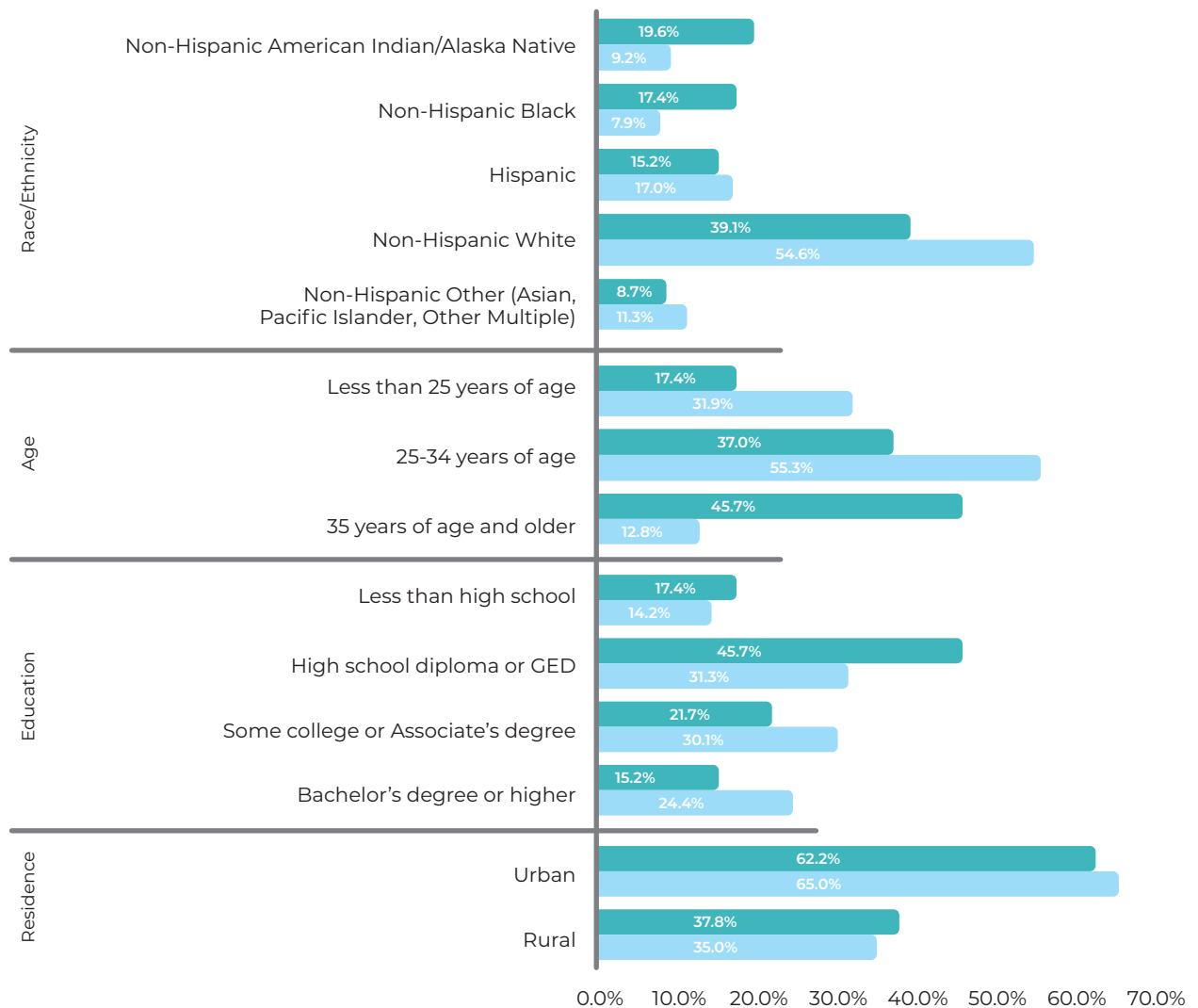
Disclaimer

Of note, maternal mortality estimates of race and Hispanic origin in prior reports included race classification based on “bridged race”, where multiple race individuals were “bridged” to a single-race category per a complex algorithm based on the individual’s place of residence and the population makeup of that region.²⁰ Starting in the 2021 data year, the CDC and Oklahoma vital statistics transitioned from conducting population estimates by race via “bridging” to reporting single-race estimates with multiple race individuals included in a separate category. Estimates for maternal mortality by race were calculated for this report using the new single-race classification, and therefore may differ slightly from past reports.

Race/Hispanic Origin, Age, Educational Attainment, and Residence

Compared with live births, maternal mortality disproportionately affected Non-Hispanic Black mothers, Non-Hispanic AIAN mothers, mothers 35 years of age or older, mothers who received a high school education or less, and mothers with a rural residence (Chart 10).

Chart 10: Demographic characteristics of maternal deaths and live births, Oklahoma 2020 - 2022



Source: Oklahoma Vital Statistics, 2020 - 2022

Definitions: Maternal death - underlying cause of death A34, O00-O95, O98-O99

Maternal Mortality Review Committee (MMRC)

Definitions

*MMRC Definitions:*²¹

- **Pregnancy-associated death:** A death during or within one year of pregnancy, regardless of the cause. These deaths make up the universe of maternal mortality; within that universe are pregnancy-related deaths and pregnancy-associated, but not related deaths.
- **Pregnancy-related death:** A death during or within one year of pregnancy, from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.
- **Pregnancy-associated, but not related death:** A death during or within one year of pregnancy, from a cause that is not related to pregnancy.
- **Preventability:** A death is considered preventable if there was at least some chance of the death being prevented by one or more reasonable changes to patient, family, provider, facility, system, and/or community factors. This definition is used by MMRCs to determine if a death they review is preventable.

Overview

Oklahoma has a process to identify and explore the medical facts surrounding maternal deaths that has been designed to help improve health care for pregnant and postpartum women. The Maternal Mortality Review Committee (MMRC) is an essential statewide effort that has been established through legislative action. The MMRC is a statutory committee with defined membership, responsibilities, and reporting criteria utilized to explore opportunities to enhance and improve services to women, infants, and their families. Through communication and collaboration, the MMRC serves as a continuous quality improvement system that will result in a more complete understanding of maternal issues and identify challenges surrounding maternal health care services. The overall goal of the MMRC is prevention through understanding of causes and risk factors by way of qualitative, in-depth reviews.

The Maternal Mortality Review Project in Oklahoma originated as a joint effort between the Oklahoma State Department of Health and the Oklahoma State Medical Association (OSMA). The committee began reviewing maternal deaths in 1950, with the purpose of improving obstetric care and ultimately reducing maternal morbidity and mortality in Oklahoma. At that time, the OSMA had the lead role in maternal mortality review. The committee reviewed in detail 75.9% of the pregnancy-related deaths in Oklahoma, during the years of 1950 – 1979.

The Maternal and Child Health Service of the Oklahoma State Department of Health (OSDH) re-established the MMRC in 2009, which became a statutory committee in 2019 per the “Maternal Mortality Review Act”, House Bill 2334.²² Through this legislation, the MMRC received statutory authority to review pregnancy-associated deaths and obtain records and reports pertaining to pregnancy-associated deaths (e.g., medical examiner reports, medical records, law enforcement records). The act also determined membership of the MMRC (twenty-five members: eighteen specified positions or their designees and seven members appointed by the Commissioner of Health for two-year terms) and established that MMRC meetings are subject to the Oklahoma Open Meeting Act and that review must be conducted in executive session.

While the Maternal Mortality Review Act gives statutory authority to the MMRC to request records for use in the review of pregnancy-associated deaths, there are limitations to data ascertainment. Oklahoma state statute does not necessarily apply to tribal organizations and providers, due to indigenous data sovereignty, or the inherent right of the Tribal Nations to govern the collection of their data, its ownership, and the application of its own data.²³ Therefore, the MMRC has challenges obtaining records from tribal providers and facilities, which often limits the information available for review for tribally-affiliated cases. Limitations in access to prenatal, delivery, and postpartum care records can pose challenges in assessing the events and factors which contributed to a pregnancy-associated death, and thus may limit the ability to determine the pregnancy-relatedness, preventability, and actionable recommendations to prevent a death. More information about this challenge, and efforts to address it, can be found in the appendix of this report.

The Maternal Mortality Review Act was then amended in 2024 through House Bill 2152 (going into effect November 1, 2024) to reduce the membership of the MMRC, establish new law to require reasonable and good-faith effort for hospitals and related institutions to report a death to the medical examiner which occurred during pregnancy or within one year of termination of pregnancy, and amend medicolegal investigation statute to add maternal deaths to those which should be investigated.²⁴ The amendments to the Maternal Mortality Review Act and other relevant statutes aim to increase the efficiency of the MMRC and increase the data available for MMRC reviews by increasing the likelihood of an autopsy referral and report for maternal deaths.²⁵

Per this bill, MMRC membership will be reduced from twenty-five members to eleven members: eight specified positions or their designees and three members appointed by the Commissioner of Health for two-year terms. Membership includes the Director and Medical Director of the Oklahoma Perinatal Quality Improvement Collaborative (OPQIC), the Director and Administrative Program Manager of the Perinatal and Reproductive Health Division of the OSDH Maternal and Child Health Service, the Chair of the Oklahoma Chapter of the American College of Obstetricians and Gynecologists (ACOG), the President of the Oklahoma Chapter of the American College of Nurse-Midwives (ACNM), the Chair of the Oklahoma Chapter of the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN), the Executive Director of the Southern Plains Tribal Health Board (SPTHB), a physician who is a member of the OSMA or Oklahoma Osteopathic Association, a maternal-fetal medicine physician, and an individual who has been affected by pregnancy-related or pregnancy-associated deaths, severe maternal morbidity, and/or lack of access to maternal health care services. The bill also establishes that a hospital or birthing center shall make a reasonable and good-faith effort to report deaths during pregnancy or within one year of termination of pregnancy to the Office of the Medical Examiner within 72 hours of the death. Further, the legislation amends the statute on medicolegal investigations, adding maternal deaths which occur during pregnancy or within one year of termination of pregnancy to the types of deaths which should be investigated by the Office of the Medical Examiner.

The MMRC operates under the auspices of the Oklahoma State Department of Health (OSDH). Through uniform procedures and defined processes, the OSDH initiates the MMRC process by identifying all pregnancy-associated cases. The Oklahoma MMRC reviews all potential maternal deaths where the official death certificate pregnancy checkbox indicates that the death of a woman aged 10 – 44 years occurred during pregnancy or within one year of pregnancy termination and the underlying cause of death is related to a maternal code. Women over 44 years of age are included in MMRC reviews if their death certificate specifies a maternal-related condition as an underlying cause of death.

The MMRC also makes a determination as to what extent the impact of timely and appropriate intervention could have had on the outcome of a particular case. The MMRC efforts are designed to:

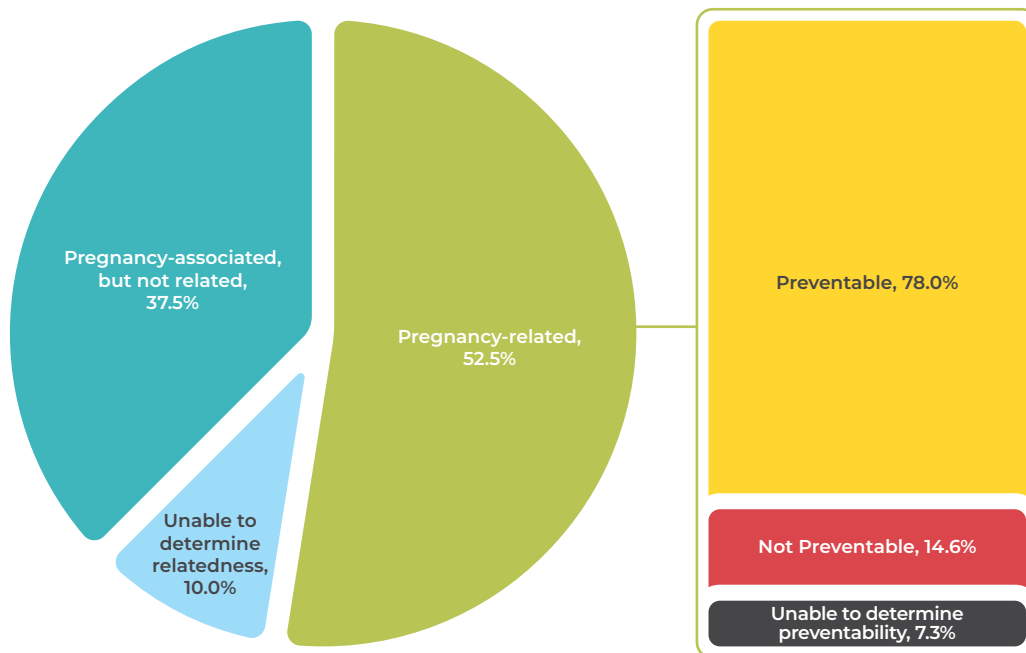
- Improve and enhance public health efforts to reduce and prevent maternal death in Oklahoma.
- Improve identification of maternal deaths in order to interpret trends, identify high-risk groups, and develop effective interventions.
- Utilize review information to identify health care system issues and gaps in service delivery and care.
- Develop action plans and preventive strategies to implement recommendations in communities and provider networks.

Interventions, strategies, and the development of systems that increase knowledge and decrease pregnancy-related mortality will serve not only to improve the health of women and children, but will also provide overwhelming health-related benefits for all Oklahomans. Health benefits could include reduced rates of obesity and smoking during pregnancy, increased access to prenatal and well-woman care, and education for health care providers on postpartum warning signs and evidence-based quality improvement strategies.

MMRC Case Reviews

The previous MMRC report included data on MMRC cases by date of review rather than date of death, due to the prioritization of reviewing cases related to COVID-19 in 2022 and 2023. This prioritization resulted in delays in completing reviews for all 2021 cases prior to the creation and publishing of the 2023 report. With reviews of 2021 deaths now complete, this report includes data on MMRC cases by date of death, for deaths occurring between 2017 and 2021 (N=80). Of these deaths, 52.5% were determined to be pregnancy-related, and 78.0% of pregnancy-related deaths were determined to have been preventable (Chart 11).

Chart 11: Relatedness of pregnancy-associated deaths and preventability of pregnancy-related deaths*, Oklahoma 2017 - 2021



Source: Oklahoma Maternal Mortality Review Committee (MMRC), 2017 - 2021

*With an MMRC determination of preventability

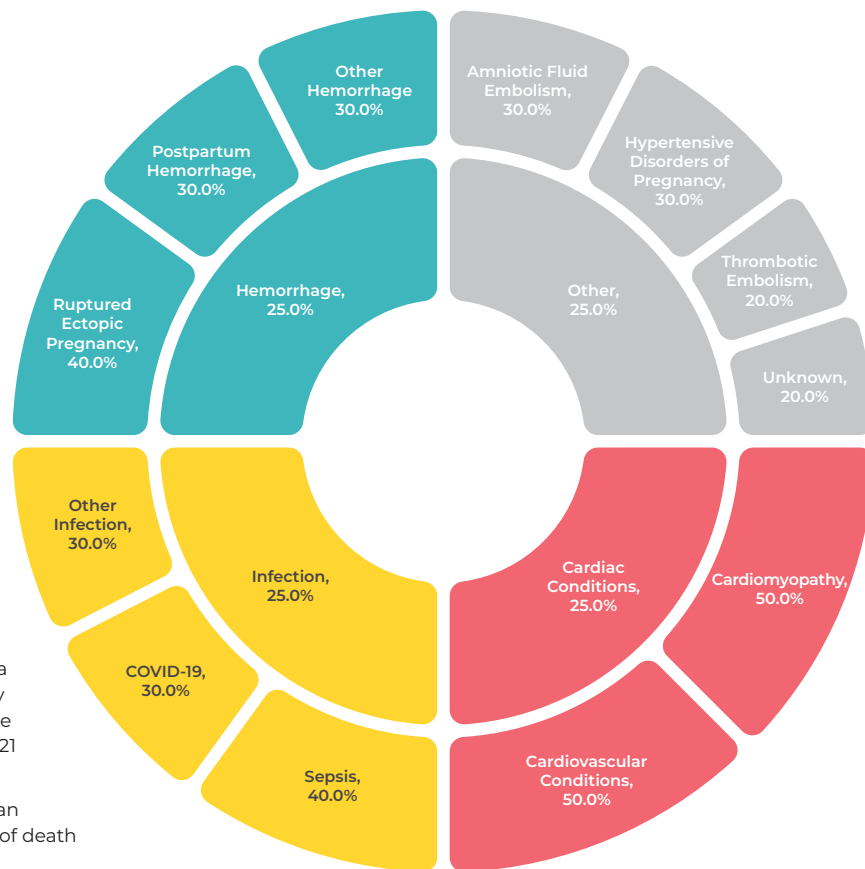
Pregnancy-Related Deaths

Top Causes of Pregnancy-Related Deaths

Among pregnancy-related deaths with an MMRC determination of underlying cause of death (N=40), the top causes of pregnancy-related deaths from 2017 – 2021 were hemorrhage, infection, and cardiac conditions, comprising three-quarters of the deaths (Chart 12). Ruptured ectopic pregnancy and postpartum hemorrhage, sepsis and COVID-19, and cardiomyopathy and cardiovascular conditions comprised the majority of hemorrhage, infection, and cardiac condition deaths, respectively. A quarter of pregnancy-related deaths were due to other causes, such as thrombotic embolism, amniotic fluid embolism, and hypertensive disorders related to pregnancy. The vast majority of deaths from the top three causes of pregnancy-related deaths were determined to have been preventable, at 100.0% of hemorrhage deaths, 90.0% of infection deaths, and 70.0% of deaths due to cardiac conditions.

Comparatively, the leading causes of pregnancy-related deaths in the United States in 2020, as determined by MMRCs, were mental health conditions, cardiovascular conditions, infection, and hemorrhage.²⁶

Chart 12: Causes of pregnancy-related deaths*, Oklahoma 2017 - 2021



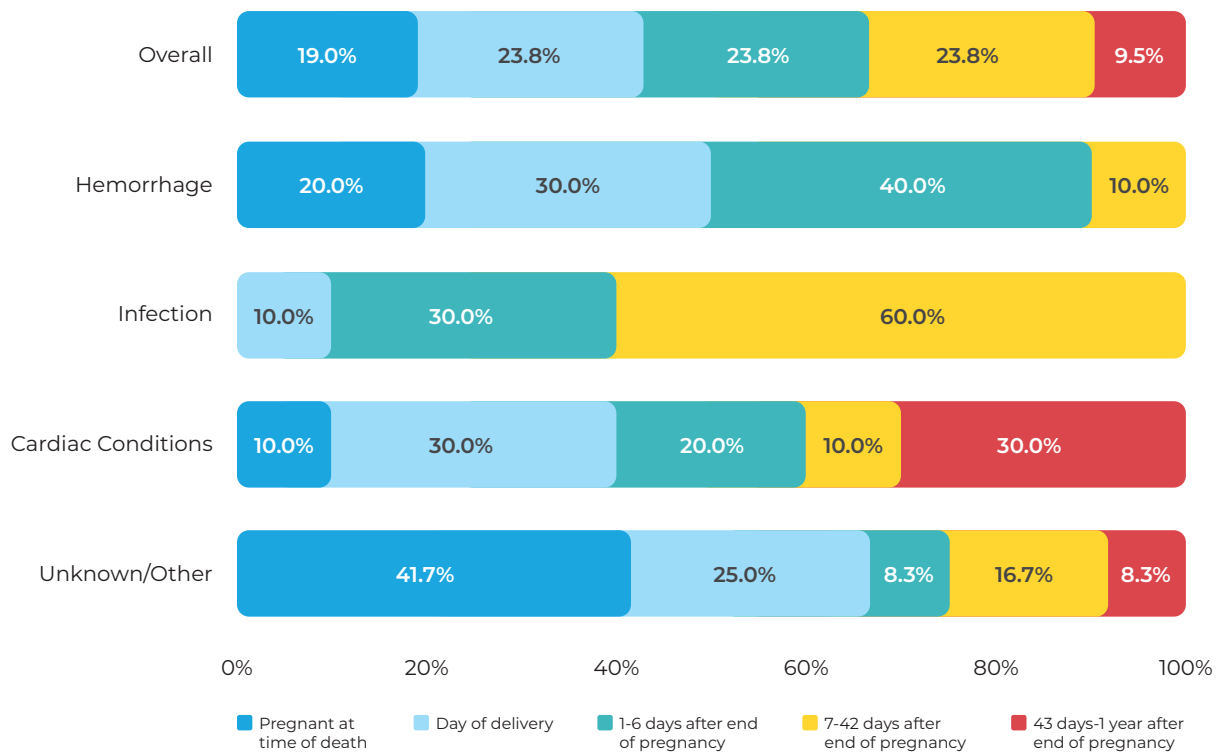
Source: Oklahoma Maternal Mortality Review Committee (MMRC), 2017 – 2021

*With an MMRC determination of an underlying cause of death

Characteristics of Pregnancy-Related Deaths

The majority of pregnancy-related deaths, approximately 57%, occurred in the postpartum period (1 – 365 days after termination of pregnancy) (Chart 13). A larger proportion of deaths related to infection (90.0%) and cardiovascular conditions (60.0%) occurred postpartum, whereas a larger proportion of hemorrhage deaths occurred during pregnancy or on the day of delivery (50.0%).

Chart 13: Timing of pregnancy-related deaths, overall and by cause of death, Oklahoma 2017-2021

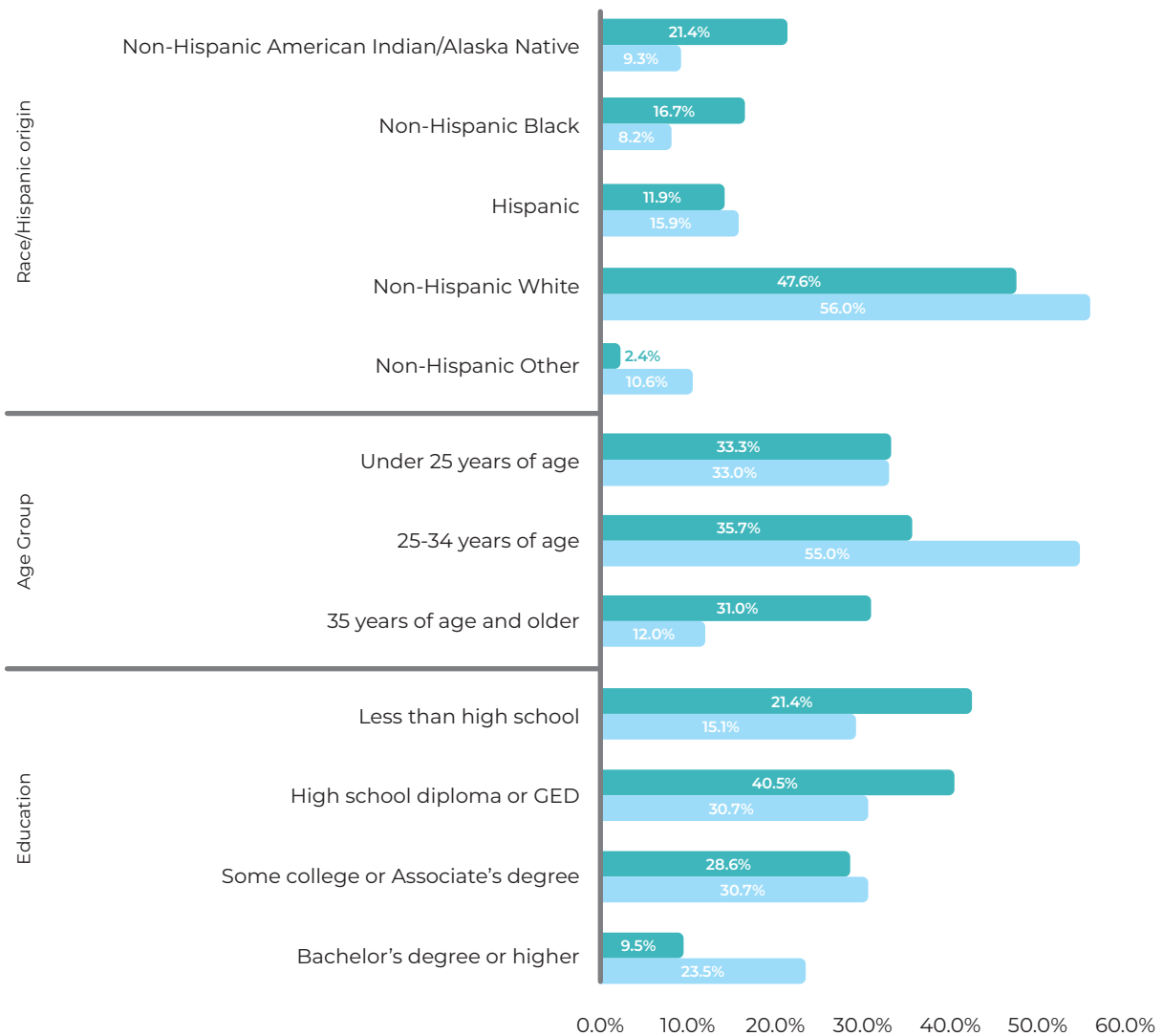


Source: Oklahoma Maternal Mortality Review Committee, 2017-2021

*With an MMRC determination of an underlying cause of death

From 2017 – 2021 in Oklahoma, pregnancy-related mortality disproportionately affected Non-Hispanic American Indian/Alaska Native women, Non-Hispanic Black women, women 35 years of age or older, and women with a high school education or less (Chart 14).

Chart 14: Demographic characteristics of pregnancy-related deaths and live births, Oklahoma 2017 - 2021



Source: Oklahoma Maternal Mortality Review Committee, 2017 - 2021;

Oklahoma Vital Statistics, 2017 - 2021 ■ Pregnancy-related deaths ■ Births

Contributing Factors

To generate actionable recommendations to reduce pregnancy-related mortality, the MMRC reviewed the factors which contributed to each pregnancy-related and preventable death. For deaths from 2017 – 2021, contributing factors at the patient or family, provider, and facility levels continued to be the most prevalent factors.

Common themes among contributing factors at the patient or family level included substance use disorders, adherence to recommendations, chronic conditions (e.g., obesity, tobacco use), knowledge, and delays in seeking and receiving care. Delays in seeking and receiving care were attributed to lack of access or financial resources, stigma, cultural or religious factors, and knowledge of when to seek care. Lack of adherence to recommendations at the patient level were noted, such as lack of or limited prenatal care and being unvaccinated for COVID-19 and influenza, specifically for deaths caused by infections.

Common themes among provider and facility factors included mismanagement of care, poor continuity of care, and delay of treatment. For several deaths, noted lower quality of care was due to the standard of care not being followed, particularly for deaths related to hemorrhage and infection.

Conclusions and Recommendations

Through comprehensive case reviews from January 2022 to April 2024, the MMRC generated recommendations identified to help improve access to quality pregnancy-related health care that will contribute to a reduction in the incidence of maternal morbidity cases and the number of maternal deaths in Oklahoma.

CONCLUSION: Many women enter pregnancy with health issues that impact pregnancy outcomes.

Recommendations:

- Increase awareness in both public and private health care providers and reproductive age individuals about the importance of preconception health regardless of pregnancy intention, since approximately half of all pregnancies are not intended at the time they occur.
- MMRC members will promote and advocate for access to health care and preventative services that support lifestyle modification across the continuum of child-bearing years.
- State agencies and community partners continue with statewide health promotion efforts to help prevent elevated BMIs.
- Continue to expand access to quality prenatal care through county health departments and mobile clinics across the state.

CONCLUSION: Current ACOG/CDC recommendations are available but not widely adopted that could improve the quality of prenatal care.

Recommendations:

- Educate health care providers on current recommendations for provision of postpartum care to include a two-week and six-week postpartum visit.
- OPQIC provides education to providers to follow ACOG recommendations on postpartum care.
- OSDH and OPQIC promote low-dose aspirin use to reduce the incidence and severity of preeclampsia between 12-28 weeks of pregnancy until delivery.
- State agencies and community partners continue with education on importance of staying current with CDC and professional organizations' recommendations for vaccination during pregnancy, including for COVID-19 and influenza.

CONCLUSION: Gaps exist in health care provider knowledge.

Recommendations:

- Maternal Health Task Force members and partners will continue to emphasize the importance of developing policies and procedures for management of postpartum hemorrhages and holding simulation exercises for staff.
- Increase utilization of SBIRT (Screening, Brief Intervention, Referral to Treatment) to improve identification of individuals in need of referral for substance use intervention and treatment.

CONCLUSION: Delays in medical intervention occurred when complications developed during pregnancy and the postpartum period, contributing to mortality.

Recommendations:

- Expand education to health care providers, pregnant women, and their families about pregnancy and postpartum warning signs and how to seek care.
- Increase awareness of possible complications by educating pregnant women and their families on pregnancy and post-birth warning signs.
- MMRC partners conduct a social media blitz to increase education related to pregnancy/postpartum complications.

CONCLUSION: Opportunities exist to improve the quality of prenatal/intrapartum/postpartum care through communication.

Recommendations:

- Promote the CDC "Hear Her" campaign to encourage pregnant women and their families to speak up and to encourage health care providers to listen and respond.²⁷
- Encourage providers and hospitals to adopt the TeamBirth initiative to ensure transparent communication and shared decision making occur among the patient, support persons, and the clinical team.^{28,29}
- Providers educate patients on routine prenatal care and where to access care to improve care coordination, and provide referrals for necessary care.
- Hospital social services assist with linkage to care, including procurement of medication and substance use services, prior to patient discharge.

- Community health workers and pregnancy resource navigators provide education about, and increase awareness of, community resources (e.g., 211, county health departments) to patients, providers, and the community.
- OSDH and OPQIC will share this annual report with additional partners including the Oklahoma Hospital Association, Oklahoma Health Care Authority, hospital system administration, and health care providers.

CONCLUSION: Opportunities exist to improve the safety of prenatal/intrapartum/postpartum care.

Recommendations:

- OPQIC will continue to promote implementation of AIM Patient Safety Bundles in all Oklahoma birthing hospitals.
- Promote and provide Emergency Obstetric Simulation Training for emergency room providers and rural hospitals without delivery services.
- Providers and facilities follow standard of care for cardiopulmonary collapse, and OPQIC/OMHTF provide education and simulation training/activities for obstetrical care readiness in the emergency department.
- Providers follow recommended practices for thromboembolism prophylaxis.
- OPQIC is partnering with Amniotic Fluid Embolism (AFE) foundation and birthing hospitals to create education on prevention and treatment of amniotic fluid embolism.³⁰

CONCLUSION: Opportunities exist for collaboration in support of legislation to improve the quality of care and prevent maternal deaths.

Recommendations:

- ACOG and the Oklahoma Chapter of the American College of Nurse Midwives will advocate for legislation requiring licensure for all midwives practicing in the state.
- ACOG should advocate for 100% of state Perinatal Quality Collaboratives (PQCs) to receive federal funding.

CONCLUSION: Health inequity can contribute to poor maternal outcomes.

Recommendations:

- Promote enrollment and completion in the Speak Up training for health care professionals providing obstetrical care.
- Promote acceptance and utilization of midwifery and doula care.
- State agencies and partners continue with pregnancy support and culturally sensitive care.

The impact of implementing recommendations made by the MMRC should help to reduce maternal mortality in Oklahoma. The MMRC agrees that the increase in shared knowledge and education among professionals and non-professionals will encourage more women and their families to seek health care prior to pregnancy, during pregnancy, and after pregnancy to improve birth outcomes.

Key Successes

The OSDH and partners are engaging in several activities to put the MMRC's recommendations into action throughout Oklahoma, by raising awareness of maternal health topics, improving patient care and safety, increasing access to care, and improving data collection for MMRC reviews.

Raising Awareness

Social Media Campaigns

- The OSDH, OPQIC, and SPTHB are engaged in several social media campaigns related to maternal health topics, including but not limited to, low-dose aspirin use, preconception health, the importance of prenatal care, COVID-19 in pregnancy, and vaccine promotion, particularly for influenza and COVID-19.
- The OPQIC promotes the CDC's "Hear Her" campaign through conducting social media campaigns and collaborating with partners to promote the campaign, as well as offering resources and training programs for providers to effectively communicate with patients, identify potential complications, and provide timely interventions.
- The OSDH continues to partner with the SPTHB to conduct culturally competent social media campaigns for maternal health topics, including but not limited to, congenital syphilis, birth defects awareness, interconception health, and vaccine promotion.

Toolkits and Trainings

- The OSDH, OPQIC, and the George Kaiser Family Foundation developed a toolkit to educate patients and providers on the risk factors and symptoms of preeclampsia and the recommendation of low-dose aspirin use for those at risk of developing preeclampsia.³¹ The toolkit includes a screening for preeclampsia risk factors, prescribing guidelines for providers for low-dose aspirin, and resources for patients with instructions for use and adherence to a low-dose aspirin regimen. The OPQIC is also engaged in public awareness campaigns to promote the initiative, including social media campaigns, billboard promotions, presentations at health care facilities and conferences, and news media coverage.
- The OPQIC develops, disseminates, and has publicly available the Empower Pregnant and Postpartum Patients Toolkit, which includes information and resources for patients and providers on urgent maternal warning signs and post-birth warning signs to signal when to seek emergent care from a health care provider.³² The OSDH and OPQIC also work with birthing hospitals to ensure that patients giving birth are given information on post-birth warning signs during their birth hospitalization, before and at discharge, to increase knowledge on when and how to seek care for symptoms and conditions occurring in the postpartum period.^{33,34}
- The OSDH and OPQIC have engaged with health care facilities, providers, and partners to promote and facilitate participation in the Speak Up training³⁵, to increase health care worker awareness of racial disparities and culturally insensitive treatment, and to identify strategies to promote client-centered care and shared decision-making.

Improving Patient Care and Safety

Initiatives

- The OSDH and OPQIC have worked with hospitals throughout the state to implement the TeamBirth initiative in all birthing hospitals in Oklahoma. The TeamBirth initiative aims to improve communication and collaboration between pregnant women, their support people, and health care providers throughout the birthing process to improve patient outcomes and ensure everyone involved feels empowered to participate in decision-making. TeamBirth participants have reported increased satisfaction and perceptions of autonomy and increased trust in their health care team during their birthing experiences.

Trainings

- With over half of the state's counties being maternity care deserts, non-obstetric providers may see patients with emergent obstetric and postpartum clinical situations.¹ The OSDH, OPQIC, and the Oklahoma Hospital Association are actively engaging with rural and non-obstetric emergency care teams to provide resources and education on obstetrical care readiness for emergency care providers, through didactic and simulation activities.³⁶ The program aims to ensure that emergency care providers are equipped to handle common obstetric and postpartum emergencies (e.g., ectopic pregnancy, preeclampsia, hemorrhage) to improve quality of care and outcomes for women experiencing pregnancy-related complications who seek care at the emergency department.

Patient Safety Bundles

- The Alliance for Innovation on Maternal Health (AIM) program provides several patient safety bundles to address causes of preventable severe maternal morbidity and mortality throughout the United States.³⁷ These bundles are collections of evidence-informed best practices developed by multidisciplinary experts.
- The OPQIC implemented the AIM Obstetric Hemorrhage and Severe Hypertension in Pregnancy bundles in 36 hospitals from 2015 – 2021.³⁸⁻⁴¹ To support implementation of the AIM bundles, OPQIC provided educational resources and training programs to providers, and collaborated with hospitals to collect data on bundle implementation. Hospitals participating in these initiatives saw substantial increases in screening and treatment measures for hemorrhage and hypertension, as well as an approximate 25% reduction in severe maternal morbidity.
- A third AIM bundle, Obstetric Care for Women with Opioid Use Disorder, was implemented through a collaboration between the OSDH, OPQIC, and the Oklahoma Department of Mental Health and Substance Abuse Services. This initiative focused on identification of pregnant women using opioids through implementation of SBIRT and provided education and resources for hospitals and provider offices for developing protocols and tracking data.⁴² The OSDH provided support for the initiative through the State Maternal Health Innovation Program Grant, expanding the scope beyond opioids. The initiative aims to improve access to care and outcomes for pregnant women with substance use disorder and their infants through resources for providers and mothers, public awareness campaigns, and collaborations with hospital and community partners.

Increasing Access to Care

Direct Care

- The OSDH began offering maternity care at select county health departments in 2022, and currently offer care in nine county health departments throughout the state.⁴³ Maternity care clinics offer routine prenatal care, linkage with local obstetric providers for delivery and transfer care for high-risk conditions, case management, education and referrals to wrap-around services, nutrition counseling, and WIC referrals.

SoonerCare Coverage Expansion

- The Oklahoma Health Care Authority (OHCA) extended SoonerCare postpartum coverage from 60 days to 12 months in January 2023.⁶ This extension will assist in providing access to postpartum care for SoonerCare enrollees, as well as reduce disrupted insurance coverage and health care access for participants in the SoonerCare for Pregnant Woman program.
- Effective February 1, 2023, the OHCA expanded prescription coverage to cover low-dose aspirin for pregnant members at high risk for preeclampsia without requiring a prior authorization.⁴⁴ This coverage can improve access for those at risk of preeclampsia to an evidence-based preventive medication regimen and reduce possible complications of preeclampsia.
- Beginning July 1, 2023, SoonerCare began offering doula services to pregnant enrollees, covering eight prenatal/postnatal visits and one labor and delivery visit.⁴⁵ This benefit can help increase awareness and utilization of doula services, specifically for populations who may struggle with access to care.

Improving Data Collection for MMRC Reviews

- Per House Bill 2152, legislation was passed and signed by the governor to require a reasonable and good-faith effort for hospitals and birthing centers to report deaths occurring during pregnancy or within one year of termination of pregnancy to the Office of the Medical Examiner, and will add maternal deaths as a type of death to be investigated by the Office of the Medical Examiner.²⁴ The amendments will also decrease the membership of the MMRC from twenty-five to eleven members, and goes into effect November 1, 2024. The bill aims to increase the efficiency of the MMRC and increase the data available for MMRC reviews by increasing the likelihood of an autopsy referral and report for maternal deaths.²⁵

Appendix: Tribal Addendum

Data Challenges

A known challenge of assessing mortality in tribal populations is the possibility of racial misclassification on death certificates. Racial misclassification refers to the concept of people being recorded as a different race than their self-identified race on government records.⁴⁶ American Indian or Alaska Native persons are more likely to be incorrectly classified on death certificates compared with other race groups. The CDC estimates that from 1979 – 2011, when comparing the race on death certificates to self-identification on the Current Population Survey from the Census, only 51 to 55% of those who self-identified as American Indian or Alaska Native were correctly classified as such on their death certificate.⁴⁷ Those who were misclassified were most likely to be classified as White on their death certificate. Further, an analysis of racial misclassification in Oklahoma using Indian Health Service (IHS) linkage found that while misclassification significantly improved from 1991 – 2015, approximately 1 in 5 American Indian/Alaska Native persons were misclassified as another race on their death certificate.⁴⁸ This misclassification also resulted in significant underestimates of actual American Indian/Alaska Native deaths, by approximately 29% from 2011 – 2015. Racial misclassification is more likely to occur in mortality data, as self-report of demographic information is not possible and the data collector (e.g., funeral director, medical examiner, coroner) may rely on information from the decedent's next of kin or their own assumptions based on subjective observation if next of kin are unavailable. It may also be difficult to obtain information on specific tribal affiliation or membership, even with next of kin available: decedents may be initially misclassified and the data collector is not prompted to enter tribal affiliation, the data collector may not have information on affiliation available, or the decedent's family may not agree on affiliation.

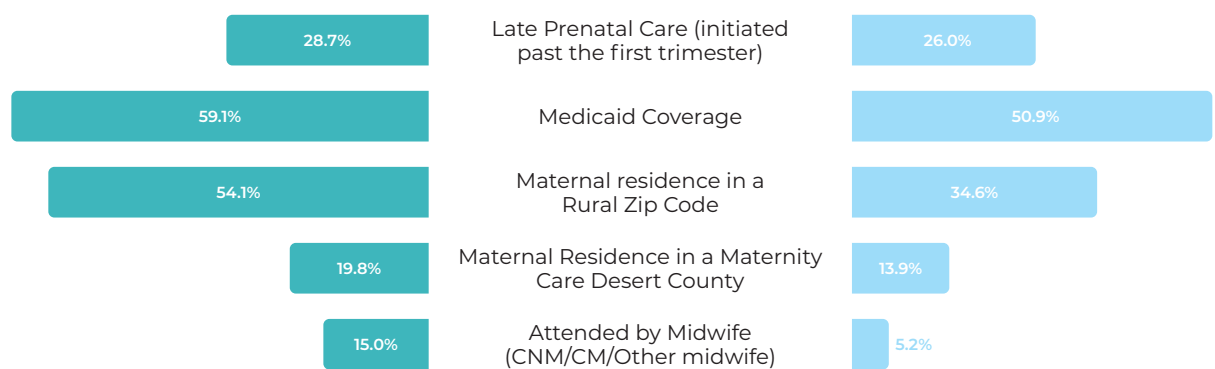
Further, for comparisons with other race groups, American Indian/Alaska Native persons are often aggregated for analyses and reports as Non-Hispanic American Indian/Alaska Native alone, where individuals are counted as American Indian/Alaska Native if the option is selected as their only race and they do not report Hispanic origin. This approach excludes those who identify as American Indian/Alaska Native in addition to another race group or report having Hispanic origin. Per the 2020 Census, approximately 2.3 million people identified themselves as Non-Hispanic American Indian/Alaska Native alone, comprising 0.8% of the total United States population.⁴⁹ However, nearly 9.7 million people identified themselves as American Indian/Alaska Native alone or in combination with another race regardless of Hispanic origin, comprising 2.9% of the total population. Comparatively, for Oklahoma births in 2022, 9.0% of mothers were Non-Hispanic American Indian/Alaska Native alone, while 15.8% of mothers were American Indian/Alaska Native alone or in combination regardless of Hispanic origin, and over 70% of multiple race mothers were American Indian/Alaska Native in combination with at least one other race. While single race classifications exclusive of Hispanic origin are beneficial for comparing mutually exclusive race/Hispanic origin groups, the method excludes multiple race individuals, a group which has grown considerably, by 276% between the 2010 and 2020 Census.

Due to potential racial misclassification on death certificates, review of maternal deaths by an MMRC can provide further data sources to more accurately identify tribally-affiliated deaths, since other records with self-reported race may be utilized in the process of review (e.g., prenatal, delivery, and postpartum records). These records are instrumental in MMRC reviews, as records of care before, during, and after pregnancy can provide a timeline of events and an overarching view of the factors that contributed to the death. However, as

mentioned on page 20, Oklahoma MMRC abstractors have challenges receiving relevant records from tribal providers and facilities due to indigenous data sovereignty: “the right of each Native nation to govern the collection, ownership, and application of the tribe’s data”.²³ As federally designated sovereign nations, Tribes have the right to determine what, how, and with whom their data is shared and how the data is used. Based on these principles, tribal entities are therefore excluded from statutory authority of the MMRC to obtain records relevant for case review. While this exclusion can create gaps in the data available for MMRC review, indigenous data sovereignty must be respected and promoted.

Another challenge to record acquisition is that American Indian/Alaska Native women may have limited prenatal care or receive care outside the health care system. A qualitative study of women from a Northern Plains tribe investigated perceptions of and barriers to receiving prenatal care for American Indian/Alaska Native women.⁵⁰ The study identified communication, institutional, and other barriers, such as distrust of the health care system, lack of continuity of care, and interpersonal problems which could prevent women from seeking care and attending appointments, such as transportation issues, work schedules, poverty, abuse, mental health conditions, and substance use. Participants also indicated strong preference for nurse midwife maternity care, due to more personalized and consistent care, as well as discomfort with male providers. These barriers may result in delayed or disjointed prenatal care, care outside of the health care system, or lack of prenatal care altogether. For Oklahoma specifically, American Indian/Alaska Native mothers in 2022 were more likely to receive late prenatal care, be covered by Medicaid, reside in a rural area or maternity care desert, and have a birth attended by a midwife, compared to mothers overall (Chart A-1). These factors suggest that American Indian/Alaska Native mothers in Oklahoma may experience similar barriers to receiving prenatal care services to those observed in the Northern Plains region.

Chart A-1: Characteristics of 2022 Oklahoma births, American Indian/Alaska Native mothers* and overall



*American Indian/Alaska Native alone or in combination, regardless of Hispanic origin

Source: Oklahoma Vital Statistics, Live Births 2022

American Indian/Alaska Native Births
Overall Births

Additionally, in Oklahoma American Indian/Alaska Native persons may struggle with access to care and continuity of care. There are nine Indian Health Service (IHS) facilities, 34 tribally-run health care facilities, and two Urban Indian Organizations (UIOs) throughout Oklahoma, which provide a range of services for tribal members (Map A-1). However, while IHS facilities provide services to members of federally recognized tribes, other tribal health care facilities serving tribal members may offer similar or additional services to IHS facilities but have varying eligibility criteria to receive services. For example, some facilities may require general American Indian/Alaska Native descent, while others may require affiliation with a specific tribe. Therefore, tribal members may have difficulties accessing care depending on their tribal affiliation and distance from a facility where they meet eligibility criteria to receive services. Individuals may also require additional care outside the scope of IHS or tribally-run facilities and require referrals to non-tribal health care facilities. Further, individuals who receive care at several types of facilities may experience higher rates of fragmented care due to several factors, including reliance on resident clinicians, heavy patient loads, lack of provider coordination across departments and facilities, and differing electronic health record systems.

Map A-1: Indian Health Service, Tribal, or Urban Indian Health Program facilities in Oklahoma



Source: <https://www.ihs.gov/findhealth care/>

Fragmented health care, limited prenatal care, and seeking care outside of the health care system pose additional challenges for record acquisition for the purpose of MMRC reviews, due to constraints in the availability of records and ability to acquire records. These challenges, in addition to limitations in data collection due to racial misclassification and data sovereignty, can impact the availability of records for MMRC review as well as the conclusions and recommendations that can be generated from review of tribally-affiliated maternal deaths.

Addressing Data Challenges

Notably, American Indian/Alaska Native persons experience health disparities in both health outcomes and social drivers of health (nonmedical factors that influence health outcomes), for which cultural trauma is a major contributing factor.⁵¹ These factors include poverty, food insecurity, lack of quality education and health education, racial and socioeconomic discrimination, and adverse childhood experiences. In Oklahoma specifically, American Indian/Alaska Native persons were more likely to experience poverty and food insecurity compared to nontribal populations, and nationally, Non-Hispanic American Indian/Alaska Native women were 2.3 times more likely to experience pregnancy-related mortality than Non-Hispanic White women from 2007 – 2016.⁵²⁻⁵⁴

To address the increased burden of maternal mortality and its contributing factors in American Indian/Alaska Native populations, the CDC and the National Indian Health Board (NIHB) are working with tribal organizations to explore the possibility of tribally-led MMRCs.⁵⁵ Currently there are no tribally-led MMRCs, and few MMRCs have tribal representation. While Oklahoma is one of the few states to have specific tribal representation on their MMRC, there are still the aforementioned barriers to identifying and reviewing tribally-affiliated MMRC cases.

In August 2023, the CDC launched a funding opportunity to strengthen the quality, performance, and infrastructure of tribal public health systems: the Strengthening Public Health Systems and Services in Indian Country grant. The Southern Plains Tribal Health Board (SPHTB) received funding through this grant and has initiated the Supporting Maternal Mortality Prevention in Indian Country program. As part of this program, SPTHB is working with multiple governmental and nongovernmental partners to assess the feasibility of a tribally-led maternal mortality review committee in Oklahoma.

The establishment of a tribally-led MMRC, or MMRC component, could substantially improve the review of tribally-affiliated cases, both in case abstraction through improved data acquisition and in case review through improved cultural competency and perspective during the review process. The partnerships developed through this funding opportunity include collaborations with the OSDH Maternal and Child Health Service as well as the Oklahoma MMRC, in review of data sharing agreements and protocols, convenings, and the dissemination of relevant educational materials as part of determining the feasibility of an MMRC model more equipped to serve tribal communities. There are several potential models for tribally-led MMRCs, each having specific considerations with varying advantages and disadvantages.⁵⁶ However, since the Oklahoma MMRC is a statutory committee, there are limitations on which model could be implemented successfully. Therefore, the MMRC and SPTHB are working closely to determine if the proposed committee models are feasible for implementation in Oklahoma, and which model is most feasible in conjunction with state statute.

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