TN Department of Health

MATERNAL MORTALITY IN TENNESSEE

ANNUAL REPORT 2024

Prepared by

Tennessee Department of Health
Division of Family Health & Wellness

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Contributors

Tennessee's Maternal Mortality Review Committee, as outlined in Tennessee Code Annotated § 68-3-601, brings together a diverse, multidisciplinary team from various fields, all committed to reviewing pregnancy-associated deaths, analyzing critical data, and developing actionable recommendations to improve maternal health outcomes across the state.

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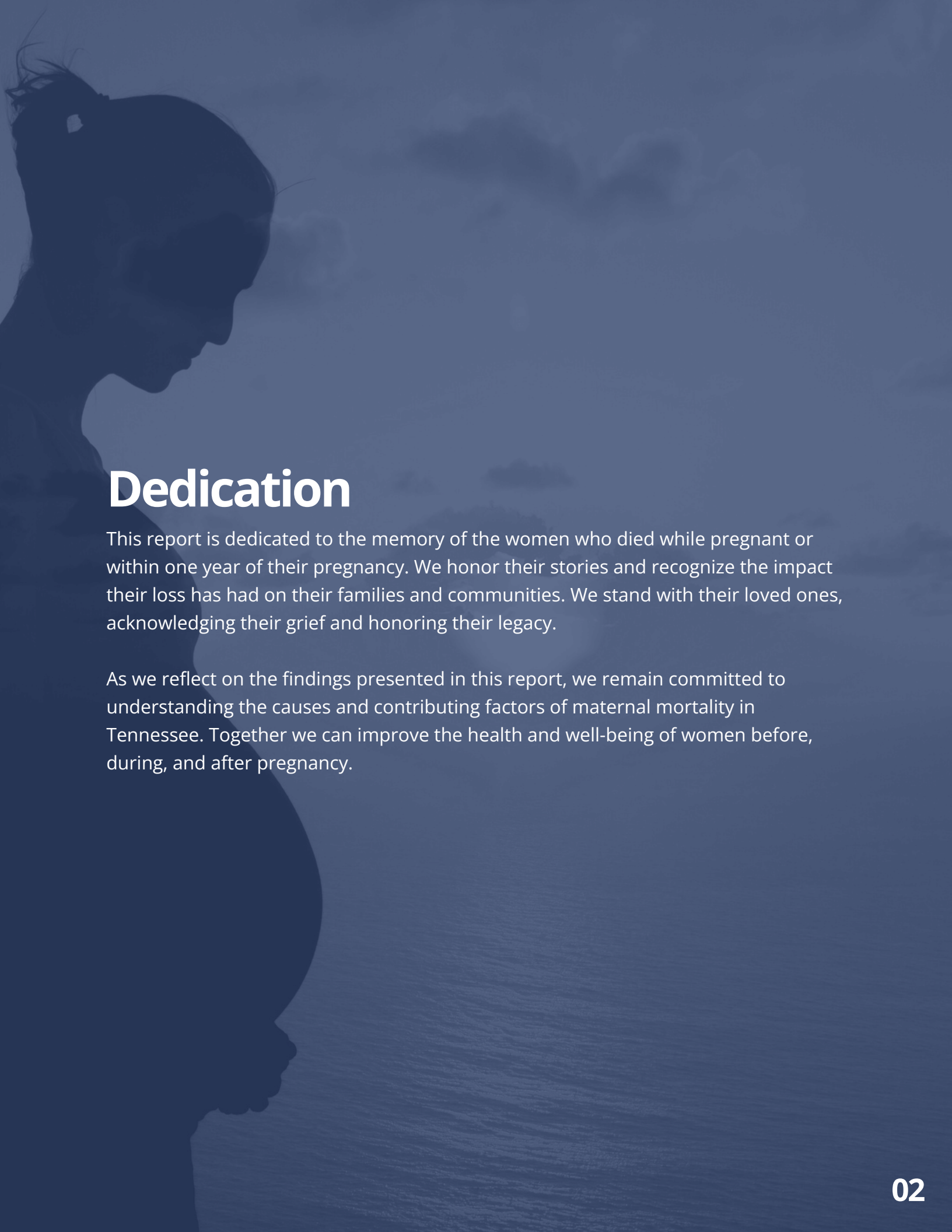


Dedication

This report is dedicated to the memory of the women who died while pregnant or within one year of their pregnancy. We honor their stories and recognize the impact their loss has had on their families and communities. We stand with their loved ones, acknowledging their grief and honoring their legacy.

As we reflect on the findings presented in this report, we remain committed to understanding the causes and contributing factors of maternal mortality in Tennessee. Together we can improve the health and well-being of women before, during, and after pregnancy.

Definitions

Maternal deaths are categorized based on the timing and cause of death. These categories are described below:

Pregnancy-associated deaths: The death of a woman during pregnancy or within one year of the end of pregnancy from any cause. This definition encompasses all qualifying deaths the MMRC reviews. Pregnancy-associated deaths can be further classified as pregnancy-related deaths or pregnancy-associated, but not -related deaths.

Pregnancy-related deaths: The death of a woman during pregnancy or within one year of the end 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 deaths: The death of a woman during pregnancy or within one year of the end of pregnancy from a cause that is not related to the pregnancy.

Pregnancy-Associated Deaths

Executive Summary

Reducing maternal mortality is a key priority in Tennessee. The Maternal Mortality Review Committee (MMRC) reviews all deaths occurring during pregnancy or within one year postpartum. This report presents findings from Tennessee's review of maternal deaths, focusing primarily on pregnancy-related deaths from 2020 to 2022. This report examines trends, leading causes, contributing factors, and disparities and outlines the MMRC's recommendations to reduce pregnancy-related deaths and improve maternal health outcomes.

Key Findings:

- **Pregnancy-associated mortality** encompasses all deaths that occur during pregnancy or within one year after the end of pregnancy, **regardless of the cause.** The rate of pregnancy-associated deaths declined between 2021 and 2022, decreasing from 164 to 122 deaths per 100,000 live births.

- A subset of these deaths, known as **pregnancy-related mortality**, includes deaths caused by or **directly related to pregnancy**, as well as those resulting from unrelated conditions worsened by pregnancy. Between 2021 and 2022, the rate of pregnancy-related deaths dropped by 15%, declining from 65 to 55 deaths per 100,000 live births.

- From 2020 to 2022, mental health conditions, cardiovascular conditions, and infections were the leading **causes of pregnancy-related deaths**, contributing to 28%, 22%, and 20% of these cases, respectively. These findings highlight the complex interplay of **medical and behavioral** health factors in maternal mortality.

- Despite overall improvements, **significant disparities** in maternal mortality persist. Non-Hispanic Black women experience pregnancy-related deaths at nearly twice the rate of non-Hispanic White women and almost three times the rate of Hispanic women. Addressing these disparities remains a critical focus in maternal health efforts.

- Regional trends also reveal concerning patterns. The East Grand Division experienced a marked increase in pregnancy-related mortality, with substance use-related deaths being a major contributing factor. This highlights the need for **targeted interventions** in specific geographic areas.

- The MMRC found that in 2022, 76% of pregnancy-related deaths were preventable. This underscores the importance of **focused prevention strategies** to address the root causes and improve outcomes for pregnant and postpartum women.

Background

Maternal Mortality Crisis

Despite advancements in healthcare, deaths related to or brought on by pregnancy have risen over the past decade in both the United States and Tennessee, devastating families and posing a serious public health challenge. The burden of these deaths is not shared equally - significant disparities persist across racial, socioeconomic, and geographic groups.

2016

The Tennessee Maternal Mortality Review Act of 2016 (T.C.A. § 68-3-601) established the Maternal Mortality Review Committee

2017

First maternal death cases in Tennessee were reviewed

2023

Maternal Mortality Review Program was granted authority to conduct informant interviews to better understand maternal mortality*

2024

Public Chapter N0. 834, signed into law during the 2024 legislative session, appointing four members from community-based organizations to the MMRC.

Statewide Action

In 2016, Tennessee passed legislation (Tennessee Code Annotated § 68-3-601) to establish the Maternal Mortality Review Committee (MMRC). The MMRC is a multidisciplinary team of diverse experts from across Tennessee dedicated to conducting thorough and systematic reviews of all pregnancy-associated deaths involving Tennessee women. The committee works to identify the contributing factors to maternal deaths and develop actionable recommendations aimed at preventing future occurrences.

In 2024, the committee expanded by adding four representatives from community-based organizations to diversify committee membership.

Report Goals

The purpose of this report is to analyze the underlying causes of pregnancy-related maternal deaths in Tennessee, identify trends and contributing factors, and put forth specific, actionable recommendations aimed at reducing preventable pregnancy-related deaths.

**Informant interviews are conversations with family members who have lost a loved one to maternal death, providing insight to help understand the circumstances surrounding the death.*

Maternal Mortality Review Process

1

CASE IDENTIFICATION

Accurately identifying deaths that occur during pregnancy or within one year postpartum—referred to as pregnancy-associated deaths—is a crucial first step in understanding the factors involved. Below are the ways in which these deaths can be identified:

1. Linkage of the death certificate to a birth certificate or fetal death record that occurred within one year of mother's death.
2. Cause of death on the death certificate that indicates current or recent pregnancy.
3. Checkbox response on the death certificate that indicates pregnancy within one year of death.
4. Linkage of the death certificate to hospital discharge data containing a diagnosis or procedure code indicating pregnancy with one year of the death.

2

RECORDS REQUEST

Requested records include medical records (from hospitals, emergency departments, and prenatal care providers), autopsy reports, and reports from legal and social services. Obituaries, social media, and media and news reports are also utilized.

3

CASE ABSTRACTION

The program's nurse abstractors use their clinical expertise to review records, extract relevant information, and summarize the case for committee review.

4

STANDARDIZED REVIEW

For each case, the MMRC is tasked with answering six key questions:

1. *Was the death pregnancy-related?*
2. *What was the cause of death?*
3. *Was the death preventable?*
4. *What were the critical contributing factors to the death?*
5. *What are the committee's recommendations to prevent future deaths?*
6. *What is the anticipated impact of implementing the recommendations?*

5

RECOMMENDATIONS INTO ACTION

Data are shared with the Maternal Health Task Force, partners, and community members to help inform and guide their future efforts in preventing maternal deaths.

Maternal Mortality Data

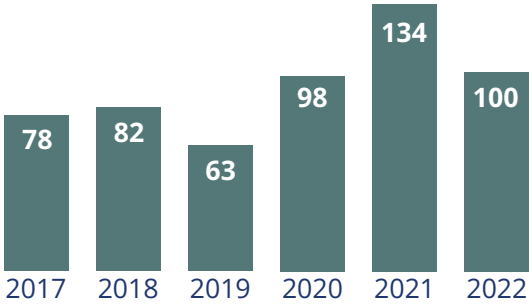
Pregnancy-Associated Deaths

A pregnancy-associated death is the death of a woman during pregnancy or within one year following the end of pregnancy from any cause. This encompasses all of the deaths that are reviewed by the MMRC.

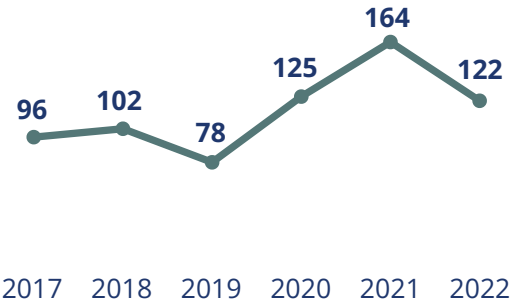
Criteria Change

In 2021, the Hospital Discharge Data System was added as a data source for case identification, which contributed to an increase in the number of pregnancy-associated deaths identified

Number of Pregnancy-Associated Deaths



Rate per 100,000 Live Births



There was a 26% decrease in the rate of pregnancy-associated deaths in 2022. Prior to this, the rate more than doubled from 2019 to 2021, with several factors contributing including an increase in overdose deaths, the COVID-19 pandemic, and improvements in identifying pregnancy-associated deaths.

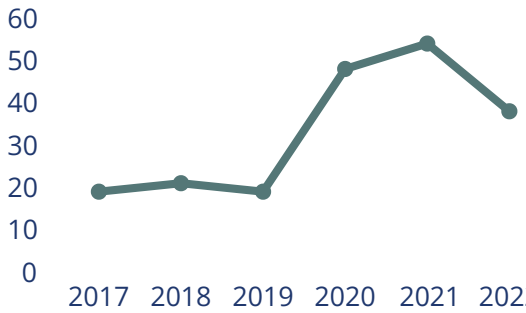
Increases in Drug Overdose Deaths

Overdose deaths represented approximately 20% of all pregnancy-associated deaths in 2017-2019, increasing to 34% in 2020-2022. The increase in overdose deaths among pregnant and postpartum women reflects increases seen in overdose deaths statewide. The rate of overdose deaths among all persons in the state nearly doubled from 2019-2021. These increases in overdose deaths were primarily driven by fentanyl, a powerful synthetic opioid.

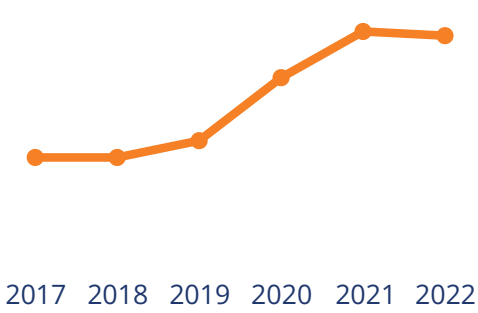
Between 2019 and 2021, the rate of overdose deaths across the state nearly doubled, while it nearly tripled among pregnancy-associated deaths

Rates of both pregnancy-associated deaths due to overdose and overall overdose deaths in Tennessee increased between 2017 and 2022.

Pregnancy-associated deaths due to overdose per 100,000 live births



All overdose deaths per 100,000 Tennessee residents**



***Office of Informatics and Analytics, Tennessee Department of Health, Fatal Drug Overdose Data Dashboard*

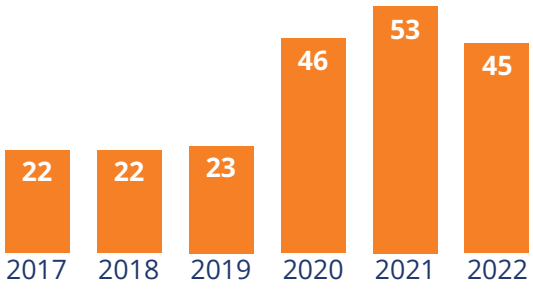
Pregnancy-Related Deaths

Pregnancy-related deaths are a subset of pregnancy-associated deaths. They are caused by or related to the pregnancy, or due to an unrelated condition that was aggravated by the pregnancy. The MMRC reviews all pregnancy-associated deaths and determines which deaths are pregnancy-related (see page 6 for more information on the MMRC review process). The aim of this section is to provide a deeper understanding of the causes, disparities, and contributing factors in pregnancy-related deaths in Tennessee.

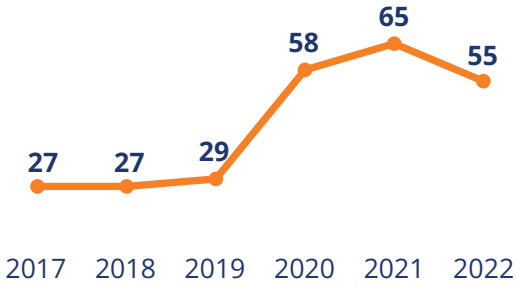
In 2022, the rate of pregnancy-related deaths decreased

15%

Number of Pregnancy-Related Deaths



Rate per 100,000 Live Births



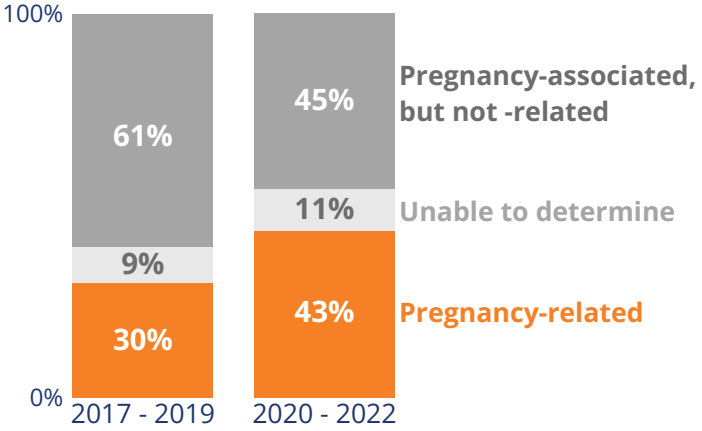
The number and rate of pregnancy-related deaths more than doubled from 2019 to 2021, followed by a 15% decrease in 2022. The percentage of pregnancy-associated deaths that were deemed pregnancy-related by the MMRC has increased. Pregnancy-related deaths accounted for 30% of all pregnancy-associated deaths between 2017-2019 versus 43% between 2020-2022. This increase was due in part to COVID-19, which can cause more severe disease during pregnancy. There were 24 pregnancy-related deaths due to COVID-19, only two of which occurred in 2022.

Criteria Change

In 2020, the MMRC adopted new criteria to determine if deaths from suicide or overdose are pregnancy-related. This change has contributed to an increase in deaths from these causes being deemed pregnancy-related

Additionally, in 2020 the MMRC implemented new criteria for determining pregnancy-relatedness in deaths due to suicide and unintentional overdose. These criteria help the committee determine when deaths due to mental health conditions are related to pregnancy. This change led to an increase in deaths from these causes being deemed pregnancy-related. For this reason, this report focuses primarily on pregnancy-related deaths from 2020 to 2022.

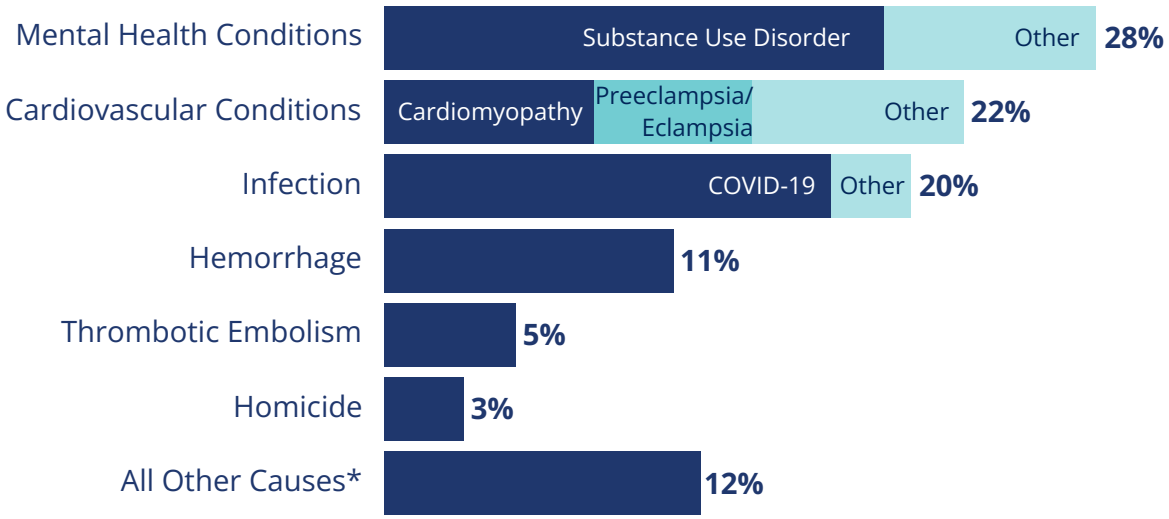
The percentage of deaths deemed pregnancy-related by the MMRC has increased.



Pregnancy-Related Deaths

A critical part of the Maternal Mortality Review process is determining the underlying cause of each pregnancy-related death. The underlying cause of death is the disease or injury that initiated the chain of events leading to death. Throughout this report, we will refer to underlying cause(s) as simply cause(s).

Leading Causes of Pregnancy-Related Deaths, 2020-2022



**Other causes include stroke, neurologic/neurovascular conditions, amniotic fluid embolism, cancer, pulmonary conditions, anesthesia complications, collagen vascular/autoimmune diseases, hematologic conditions, diabetes mellitus, and renal diseases.*

83% of deaths from infection were caused by COVID-19.

Three in four pregnancy-related COVID-19 deaths occurred in 2021

Mental health conditions accounted for 28% of pregnancy-related deaths

Mental Health Conditions

Mental health conditions were the leading cause of pregnancy-related mortality, accounting for 28% of deaths.

- Substance use disorder accounted for 70% of deaths due to mental health conditions, while depressive disorder accounted for 18%.
- The vast majority of deaths due to mental health conditions were among women living in urban areas (90%) and among non-Hispanic White women (88%).
- One in four pregnancy-related deaths due to mental health conditions was found to be a confirmed or probable suicide by the MMRC.

Cardiovascular conditions accounted for 22% of pregnancy-related deaths

Cardiovascular Conditions

Cardiovascular conditions were the second leading cause of pregnancy-related mortality, accounting for 22% of deaths.

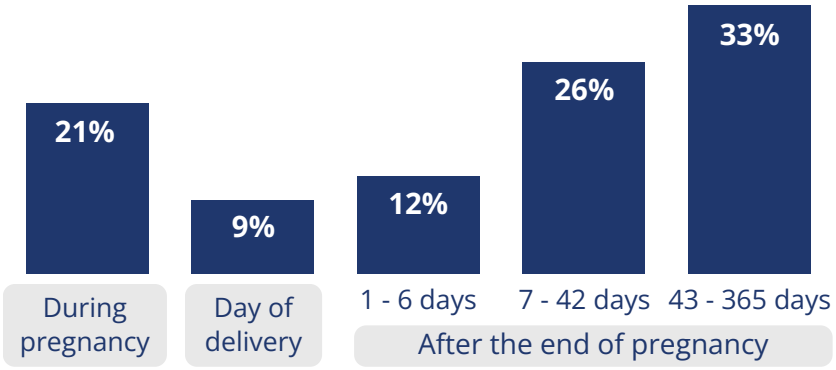
- Cardiomyopathy (disease of the heart muscle) accounted for about one-third of deaths due to cardiovascular conditions.
- Preeclampsia and eclampsia (blood pressure disorders that can develop during pregnancy and postpartum) together accounted for 29% of deaths due to cardiovascular conditions.
- Deaths due to cardiovascular conditions were more common among non-Hispanic Black women and among women aged 35 and older.

Pregnancy-Related Deaths

Timing and Location of Pregnancy-Related Deaths

From 2020-2022, more than half of pregnancy-related deaths occurred at least one week after delivery

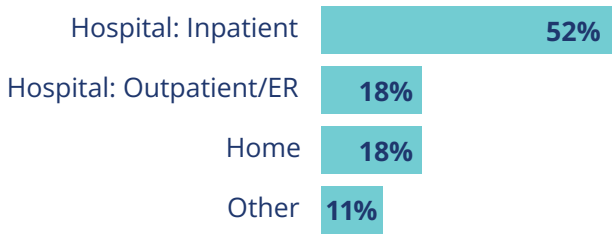
Distribution of Pregnancy-Related Deaths by Timing of Death, 2020-2022



From 2020 to 2022, most pregnancy-related deaths occurred after delivery, with one in three (33%) occurring 43 days to one year after the end of pregnancy. Only one in five pregnancy-related deaths occurred during pregnancy.

- Hemorrhage was the leading cause of death during pregnancy and on the day of delivery.
- During the first 6 weeks following the end of pregnancy (1-42 days), COVID-19 was the leading cause of death, followed by cardiovascular conditions.
- Mental health conditions, including substance use disorder, were the leading cause of deaths that occurred 43 days to 1 year after the end of pregnancy.

Most pregnancy-related deaths took place in a hospital.



The majority (52%) of pregnancy-related deaths took place in an inpatient hospital setting, where individuals received overnight care. Among deaths that occurred at home, 73% took place 43 days to one year after the end of pregnancy.

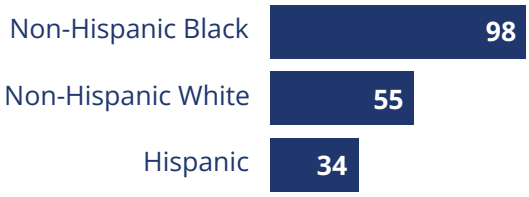
Pregnancy-Related Deaths

Racial and Ethnic Disparities

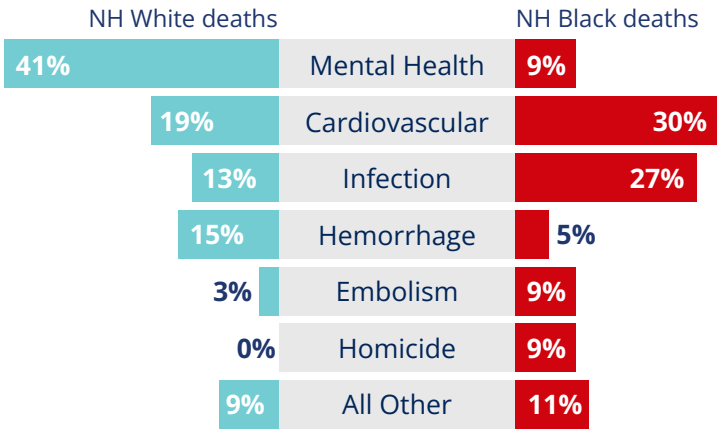
Non-Hispanic Black women experienced the highest burden of pregnancy-related death. The rate of pregnancy-related death for non-Hispanic Black women was 1.8 times as high as the non-Hispanic White rate, and 2.9 times as high as the Hispanic rate.

Pregnancy-Related Mortality Rate by Racial and Ethnic Group, 2020-2022*

**number of deaths per 100,000 live births*



Distribution of Pregnancy-Related Deaths by Cause Among Non-Hispanic Black and Non-Hispanic White Women, 2020-2022



Mental health conditions were the leading cause of death among non-Hispanic White women while cardiovascular conditions were the leading cause among non-Hispanic Black women. Substance use disorder drove mental health deaths. COVID-19 drove deaths due to infection, accounting for one in five deaths among non-Hispanic Black women and one in two deaths among Hispanic women. All deaths due to homicide were among non-Hispanic Black women and were a result of intimate partner violence.

The rate of pregnancy-related death among non-Hispanic Black women was nearly

2x

as high as the rate among non-Hispanic White women and nearly

3x

as high as the rate among Hispanic women

Between 2020-2022, there were four pregnancy-related deaths due to

Homicide.

All of them were among non-Hispanic Black women. All of the individuals were killed by their current or ex-partner.

Pregnancy-Related Deaths

Age-Related Disparities

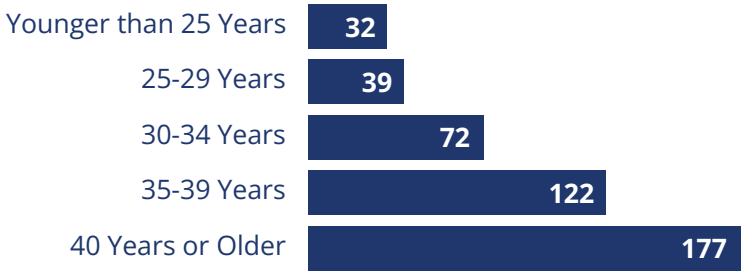
Women aged 40+ faced pregnancy-related mortality rates nearly

6x

as high as those under 25

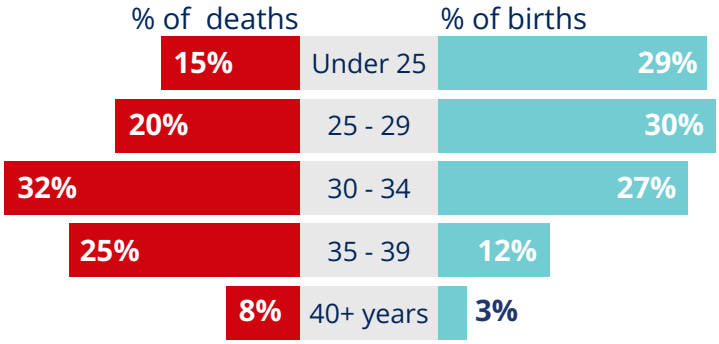
Pregnancy-Related Mortality Rate by Age Group, 2020-2022*

**number of deaths per 100,000 live births*



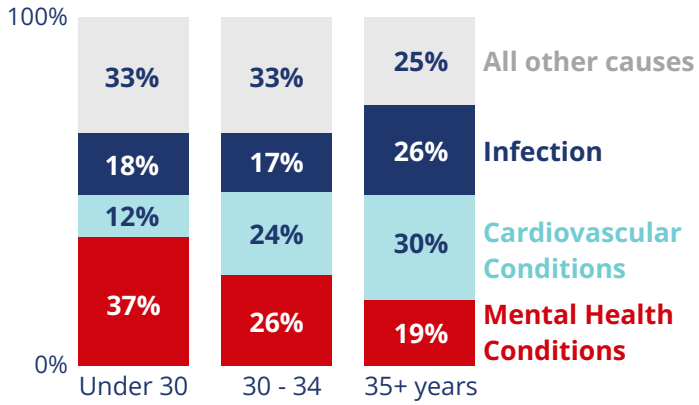
The risks of pregnancy-related complications or death increase with increasing maternal age. Women aged 40 years and older died of pregnancy-related causes at a rate nearly 6 times as high as those under 25 years of age. This is due in part to the fact that older women are more likely to have pre-existing conditions or health problems and are more likely to have multiples (e.g. twins).

Distribution of Pregnancy-Related Deaths and Live Births by Maternal Age, 2020-2022



Women less than 30 years of age make up 35% of pregnancy-related deaths, but 59% of live births. In comparison, women 30 years and older make up 65% of deaths but only 42% of births.

Cardiovascular conditions were more common among women 35 and older.



Cardiovascular conditions accounted for 30% of pregnancy-related deaths in women 35 and older

Cardiovascular conditions accounted for 30% of deaths among women aged 35 years and older while accounting for just 12% of deaths among women under 30. Mental health causes were more common among younger women, accounting for 37% of deaths to those under 30 compared to 19% among those 35 and older.

Pregnancy-Related Deaths

Disparities by Social Drivers of Health

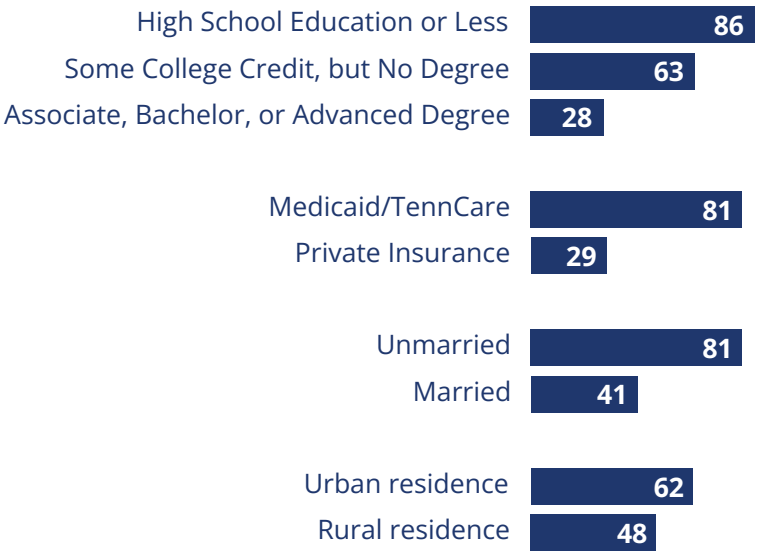
Those with a high school education or less had a pregnancy-related mortality rate

3x

as high as those with an associate degree or higher

Pregnancy-Related Mortality Rate by Select Social Drivers of Health, 2020-2022*

**number of deaths per 100,000 live births*



Social drivers of health are the conditions in which people live, work, learn, play, and age.[1] They impact health risks and outcomes as well as functioning and quality of life.

Socioeconomic factors like income and education level can tell us about the resources, access, and opportunities a person or group has.

Those with less education, those with TennCare coverage, and those who were not married experienced higher rates of pregnancy-related death compared to their counterparts. The pregnancy-related mortality rate is slightly higher among urban residents compared to rural residents. This may be due in part to deaths due to substance use disorder, the majority (93%) of which occurred in urban settings.

The pregnancy-related mortality rate among women with TennCare was nearly

3x

as high as those with private insurance

1. Adapted from Healthy People 2030, US Dept. of Health and Human Services, Office of Disease Prevention and Health Promotion. Retrieved [13 Nov. 2024], from https://odphp.health.gov/healthypeople/objectives-and-data/social-determinants-health

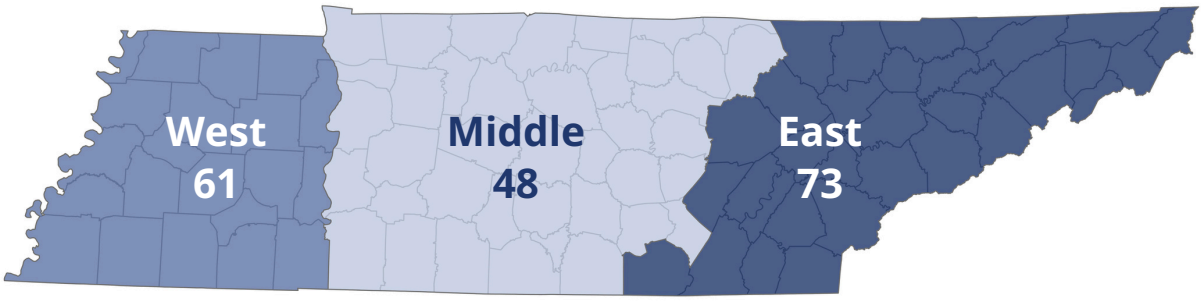
Pregnancy-Related Deaths

Geographic Disparities

During 2020-2022, the East Grand Division had the highest rate of pregnancy-related mortality. Although the rate increased in all divisions, East saw the largest increase from 2017-2019 to 2020-2022.

Pregnancy-Related Mortality Rate by Tennessee Grand Division, 2020-2022*

**number of deaths per 100,000 live births*



Between 2020 and 2022, the rate of pregnancy-related mortality in the East Grand Division was

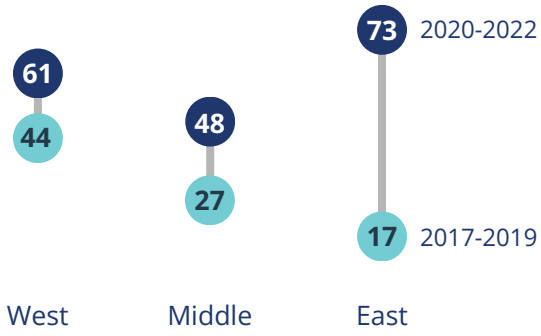
1.5x

as high as the rate in the Middle Grand Division

Comparing 2017-2019 to 2020-2022, the pregnancy-related mortality rate in the East Grand Division increased 3 fold. As a result, the division went from having the lowest rate in 2017-2019 to having the highest rate in 2020-2022. This is due in large part to an increase in substance use-related deaths, as well as changes in the criteria that the MMRC uses to determine pregnancy-relatedness for deaths due to unintentional overdose. The East Grand Division accounted for 56% of all pregnancy-related deaths due to substance use disorder between 2020-2022.

The pregnancy-related mortality rate more than quadrupled in the East Grand Division between 2017-2019 and 2020-2022.*

**number of deaths per 100,000 live births*



The West Grand Division had the second highest rate of pregnancy-related mortality. Unlike the Middle and East Grand Divisions where mental health conditions (primarily substance use disorder) were the leading cause of death, cardiovascular conditions and infections (primarily COVID-19) were the leading causes in West Grand Division. Homicide was the fourth leading cause of pregnancy-related deaths in the West Grand Division, accounting for three of the four homicide deaths that occurred between 2020-2022.

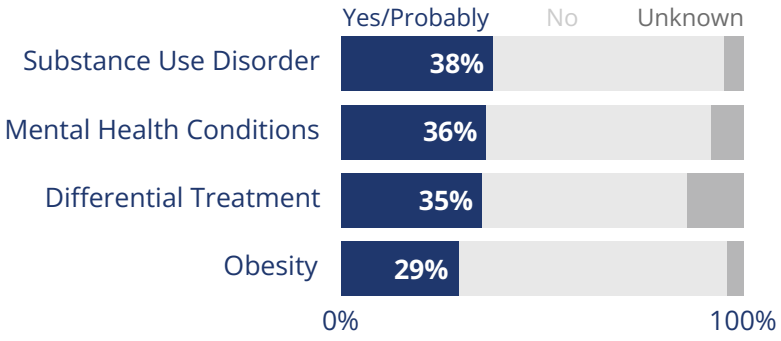
Pregnancy-Related Deaths

Circumstances Contributing to Pregnancy-Related Deaths

For every pregnancy-related death, the MMRC discusses and determines whether substance use disorder, mental health conditions other than substance use disorder, differential treatment, and obesity contributed to the death.

Substance use disorder was a contributing circumstance in 38% of pregnancy-related deaths, while it was the underlying cause in 19% of deaths

Circumstances Contributing to Pregnancy-Related Deaths, 2020-2022



Substance use disorder and other mental health conditions were key contributing factors. This is consistent with these conditions also being leading causes of pregnancy-related deaths during 2020-2022. About 30% of pregnancy-related deaths had both substance use disorder and other mental health conditions as contributing circumstances.

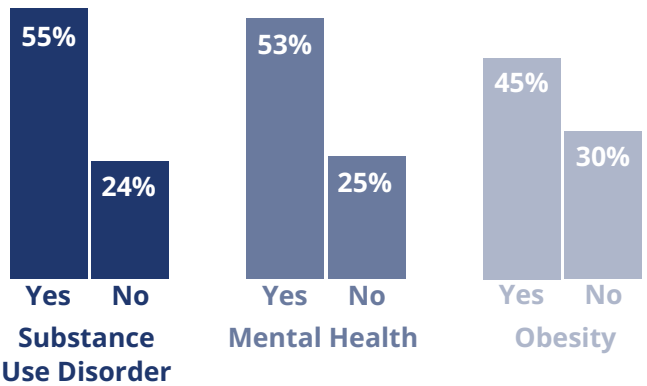
Substance use disorder as cause vs. contributor:
In all cases where the MMRC determines that substance use disorder (SUD) is involved, the committee evaluates if it is the cause of death or a contributing factor. SUD can contribute to other causes of death without being the main cause. For example, if a person dies by suicide and the MMRC determines the cause of death to be depression - if they also had co-occurring SUD, the MMRC may determine that the substance use exacerbated their depression, contributing to their death.

In deaths where obesity was a contributing factor, COVID-19 was the leading cause of death, accounting for 36%, and cardiovascular conditions were the second leading cause, accounting for 29% of these deaths. These proportions were higher for this group compared to all pregnancy-related deaths, where COVID-19 accounted for 17% and cardiovascular conditions accounted for 22%.

Differential treatment contributed to more than 1 in 3 pregnancy-related deaths between 2020-2022

Differential treatment contributed to more than 1 in 3 pregnancy-related deaths. Differential treatment was most often based on race, but was also more common among pregnancy-related deaths where substance use disorder, other mental health conditions, or obesity were contributing factors.

Percentage of Deaths in which Differential Treatment Contributed Among Those With and Without Co-Contributing Factors, 2020-2022*



**Yes and Probably determinations were grouped together for all factors.*

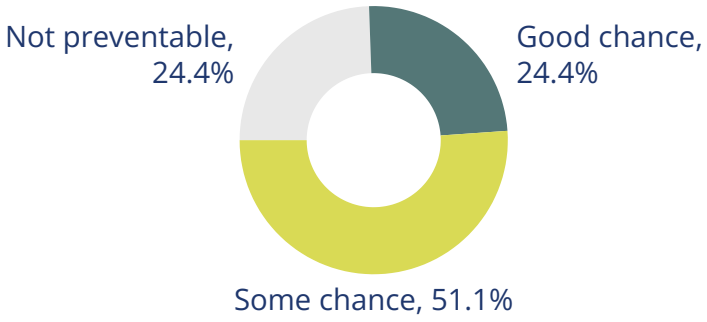
Recommendations

Preventability

Preventability and Contributing Factors of Pregnancy-Related Deaths

The MMRC considers a death preventable if it determines that there was *at least some chance* of the death being averted by one or more reasonable changes to patient, family, provider, facility, system, and/or community factors.

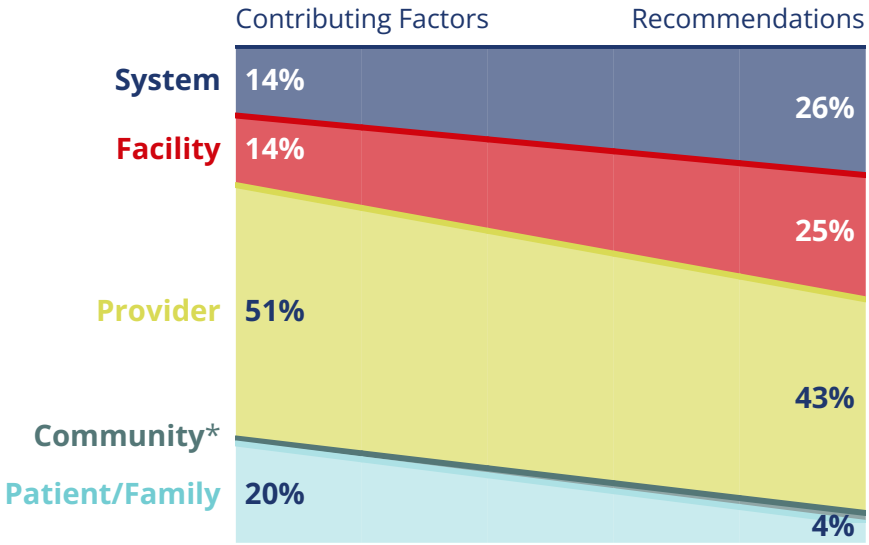
Among 2022 pregnancy-related deaths, 76% were deemed preventable by the MMRC.



In 2022, 76% of pregnancy-related deaths were considered preventable. Among all pregnancy-related deaths, 24.4% had a good chance to alter the outcome while 51.1% had some chance, and the remaining 24.4% were deemed not preventable.

In reviewing pregnancy-related deaths, the MMRC identifies factors that contributed to or impacted outcomes. These factors span various levels, including system, facility, provider, community, and patient/family.

In 2022, most contributing factors occurred at the provider level. Accordingly, 43% of recommendations were made at the provider level.



**The Community level represents 1% of contributing factors and 2% of recommendations*

About half of contributing factors occurred at the provider level, while 20% occurred at the patient/family level. While 43% of recommendations focused on changes at the provider level, about 50% targeted facility and system improvements—demonstrating the MMRC's commitment to addressing root causes and making actionable recommendations.

Opportunities for Prevention

The Maternal Mortality Review Committee identified several common contributing factors of maternal deaths occurring in 2022, highlighting key opportunities for prevention. The most frequently cited factors included:

Lack of Referrals and Coordination of Care
Insufficient communication and collaboration among healthcare providers hindered timely and effective care for pregnant and postpartum individuals.

Lack of Screenings
Inadequate screening for risk factors such as substance use, domestic violence, mental health, family medical history, and other health conditions during pregnancy limited the ability to identify and address potential complications early.

Inadequate Quality of Care
Variability in the quality of maternal healthcare services contributed to adverse outcomes, highlighting the need for continued quality improvement.

Delay in Treatment
Inadequate access to timely medical care, miscommunication among healthcare providers, and failure to recognize early warning signs of complications hindered effective treatment and increased the risk of adverse outcomes.

Lack of Resources
Limited access to healthcare resources, including financial support, educational materials, and medications including long-acting reversible contraception and naloxone, affected the ability of individuals to receive necessary care throughout pregnancy and postpartum.

The Maternal Mortality Review Committee reviewed all maternal deaths from 2022 and developed over 200 specific, feasible, and actionable recommendations to help prevent similar outcomes. These recommendations center around five key strategies to improve maternal health and are tailored for hospitals and healthcare systems, healthcare providers, state agencies, and community-based organizations. The MMRC encourages policymakers and healthcare systems to prioritize increasing awareness and education of pregnancy and postpartum complications, fostering better coordination between healthcare and social services, enhancing funding for community outreach, and expanding access to naloxone and mental health/substance use treatment.

Recommendations

strategy 1

Ongoing Education and Quality Improvement

To improve maternal healthcare, it is important for healthcare teams to receive annual trainings on prevention, recognition, and treatment of maternal health conditions, including education on recognition and mitigation of their implicit biases.

- **The State of Tennessee** is encouraged to provide recurring funding to the Tennessee Initiative for Perinatal Quality Care (TIPQC) to expand quality improvement initiatives, train healthcare teams in evidence-based strategies, and support hospital participation statewide, including in rural areas.
- **Hospital systems** are encouraged to implement comprehensive protocols for identifying and managing obstetric emergencies, including hemorrhage, hypertension, cardiac disease, and sepsis, and other maternal conditions such as mental health and substance use disorders. Providers are encouraged to receive annual training, assessments, and participate in multidisciplinary simulation training.
- **Hospital systems** are encouraged to ensure that all clinicians including non-OB clinicians and ED clinicians remain knowledgeable about OB complications during annual training and continuing education to allow for optimized screening, diagnosis, and treatment.
- **Hospital Systems** are encouraged to collaborate with TIPQC by actively participating in quality improvement projects and implementing Alliance for Innovation on Maternal Health (AIM) bundles to reduce preventable maternal deaths and severe morbidity.
- **Hospital systems** are encouraged to maintain a quality improvement structure within their facility involving regular reviews of maternal health outcome data and timely adjustments to practices and protocols to optimize care.
- **Hospital systems** are encouraged to ensure regular training for all staff, including clinicians, administrators, and support teams, on recognizing and managing implicit bias to reduce health disparities and promote equitable care.
- **Providers** are encouraged to proactively treat anemia in pregnancy and postpartum to decrease the risk of asymptomatic anemia and adverse outcomes including need for transfusion.
- **Providers** are encouraged to provide interpreter services for non-English-speaking patients, and payors should be required to reimburse associated costs, to ensure equitable and effective communication during all healthcare visits.
- **Providers** are encouraged to adhere to nationally accepted clinical guidelines for optimizing postpartum care and offer post-pregnancy consultation on the impact of their medical conditions on their ongoing health to support informed decisions about health and reproductive life planning.

Recommendations

strategy 2

Optimize Screening and Management of Maternal Cardiac Disease

To improve outcomes, it is important for providers to identify, assess, and mobilize multidisciplinary resources for effective treatment of this leading cause of maternal mortality.

- **Health systems** are encouraged to have comprehensive protocols to ensure all pregnant and postpartum women receive timely treatment for hypertension and appropriate follow up care.
- **Providers** are encouraged to assess and treat all pregnant and postpartum women during each hospital encounter for cardiovascular disease risk using clinically established algorithms, including timely referral to the maternal cardiac care team as indicated.
- **Providers** are encouraged to counsel women with a history of pre-eclampsia about the long-term cardiovascular effects and associated risks throughout their lifespans and refer high-risk patients with contraindication to pregnancy to maternal-fetal medicine (MFM) specialists.
- **Providers** are encouraged to use prevention strategies to decrease cardiac disease in pregnancy such as the use of aspirin for prevention of preeclampsia.

Recommendations

strategy 3

Multidisciplinary Care Coordination

To optimize care during and after pregnancy, comprehensive multidisciplinary care coordination is valuable and necessary. A multidisciplinary care team offers improved patient outcomes, enhanced care coordination, increase access to diverse expertise, better communication between team members, and fosters a patient-centered approach to care.

- **The State of Tennessee** is encouraged to increase funding for care coordination and nurse home visiting services for high-risk individuals during pregnancy and postpartum to decrease adverse outcomes.
- **The State of Tennessee** is encouraged to expand health insurance coverage for women of reproductive age to optimize health status prior to and between pregnancies, connect to primary care and contraceptive services, and improve access to mental healthcare.
- **The State of Tennessee** is encouraged to implement innovative solutions to improve access to healthcare-related transportation to ensure timely and equitable healthcare.
- **Correctional Facilities** are encouraged to facilitate the enrollment of incarcerated women in safety net programs or TennCare upon their release from the correctional facility, ensuring continuity of healthcare.
- **Health systems** are encouraged to provide closed loop referrals to community support services including housing, transportation, and childcare as necessary to reduce disparities due to social drivers of health.
- **Providers** and their teams are encouraged to coordinate with outpatient offices to schedule postpartum follow-up appointments after delivery and outpatient providers should follow up with patients who miss appointments to ensure appropriate care is provided.

Recommendations

strategy 4

Community Awareness and Education

To enhance awareness of maternal health issues through annual educational campaigns highlighting early warning signs, timely medical care, and family planning options.

- **The State of Tennessee** is encouraged to allocate increased funding to support annual educational outreach on the leading causes of maternal mortality in the state including mental health conditions, cardiovascular conditions, infection, and hemorrhage. This initiative should emphasize the importance of prevention, screening, treatment, and support services.

- **The Tennessee Department of Health (TDH)** is encouraged to initiate an educational campaign to raise public awareness about long-acting reversible contraceptives (LARCs), providing clear guidance on their voluntary nature and information on where and how to access them.

- **State Agencies and Community Organizations** are encouraged to conduct annual educational campaigns providing women of childbearing age, their families, and communities with information on maternal health, early warning signs, and guidance on when to seek immediate care, including raising awareness about the most common contributing factors to maternal mortality.

- **Community-Based Organizations** are encouraged to offer accessible Mental Health First Aid training and strongly encourage participation, especially for those with family members or close connections affected by mental health conditions.

Recommendations

strategy 5

Optimize Management of Maternal Mental Health, Substance Use Disorder, Intimate Partner Violence, and Suicide Risk

To implement universal screening for maternal mental health conditions, substance use disorder, intimate partner violence, and suicide risk and ensuring patients have access to relevant support services.

- **The State of Tennessee** is encouraged to implement policies and increase funding for facilities to offer universal naloxone access for pregnant and postpartum patients before hospital delivery discharge and improve the availability of naloxone in locations where overdoses occur most frequently.
- **The State of Tennessee** is encouraged to prioritize the creation of family-friendly treatment centers and mental healthcare facilities for the care of pregnant and postpartum women that are also inclusive of their families.
- **Law Enforcement Agencies** are encouraged to conduct lethality assessments for every domestic violence incident to ensure that victims are promptly connected with domestic violence service providers and have their safety concerns addressed.
- **Correctional facilities** are encouraged to continue medication-assisted treatment (MAT) during incarceration and ensure referrals for continued treatment, substance use resources, and housing stability prior to release to support successful reintegration into the community.
- **Hospital Systems** are encouraged to provide access to certified peer recovery specialists to support patients with substance use disorder and facilitate warm hand-offs to treatment programs and harm reduction programs when needed.
- **Providers and Peer Recovery Specialists** are encouraged to ensure a relapse prevention plan with an identified support system is in place until full entry into treatment services.
- **Providers** are encouraged to screen all pregnant and postpartum patients for mental health conditions in accordance with ACOG guidelines and provide appropriate evidence-based treatments including referral to psychotherapy and medication treatment, as indicated.
- **Providers** are encouraged to screen all pregnant and postpartum patients for substance use disorder and provide appropriate coordination to support services and treatment including MAT.
- **Providers** are encouraged to ensure that patients with substance use disorders have a case management consult and be offered resources for treatment at each interaction during pregnancy and the postpartum period.
- **Providers** are encouraged to screen all pregnant and postpartum patients for intimate partner violence, suicide risk, and human trafficking and provide patients with referrals to support services and resources for safe living.

Recommendations into Action

Maternal Health in Action

Community Level

The Tennessee Department of Health awarded funding to two community organizations through the MHCP grant to help them implement the recommendations of the Maternal Mortality Review Committee. These grants, funded from July 1, 2024, to September 30, 2025, aim to address maternal mortality by enhancing maternal care and support across Tennessee.

Nurses for Newborns

Nurses for Newborns TN

With this funding, NFN will focus on increasing screenings for postpartum depression and substance use disorders, improving access to support resources, and boosting attendance at postnatal checkups. Through home visits by registered nurses, NFN offers comprehensive care coordination and 24/7 on-call nursing support for mothers throughout pregnancy and the postpartum period.

Expected Outcomes for NFN

- Screen 80% of mothers for postpartum depression, referring 100% of those scoring 10 or higher on the EPDS scale to appropriate services.
- Screen 80% of mothers for alcohol, tobacco, and drug misuse, providing education or referrals for all who test positive.
- Ensure 80% mothers attend their postnatal checkup.

Servolution Health Services

Servolution

With this funding, they will provide comprehensive health services to underinsured and uninsured women, through their *EmpowHer* initiative. The program involves meeting with patients and their substance-using family members to emphasize the importance of recovery for all and to connect them with resources for creating a sober living environment. The project will screen all pregnant and postpartum women for domestic violence and substance use, ensure outpatient treatment access for pregnant women, and provide essential education and resources.

Expected Outcomes for Servolution

- To lower the number of NAS births by providing holistic healthcare, referrals to services and resources.
- Provide direct services- including healthcare, counseling, certified doula services, recovery coaching, and parenting classes, to 100 women
- Provide general services- such as referrals to treatment, recovery, medication assisted treatment to 500 women.

Maternal Health in Action
Statewide

The Tennessee Department of Health maintains strong partnerships with the Tennessee Hospital Association (THA) and the Tennessee Initiative for Perinatal Quality Care (TIPQC) in addressing pregnancy-related deaths.

Tennessee Hospital Association

THA

Founded in 1938, THA is a nonprofit membership organization that supports and advocates for hospitals, health systems, and other healthcare organizations across Tennessee. THA has worked to educate and raise awareness among Emergency Department staff at non-delivering hospitals to improve the assessment, treatment, and referral of pregnant and postpartum women. They identified opportunities to strengthen partnerships between perinatal educators, system educators, and non-delivering hospitals throughout the state.

The Tennessee Hospital Association has been actively working to reduce maternal mortality in Tennessee over the past several years.

- In 2022, THA's Maternal Mortality Reduction Project collaborated with TIPQC to engage non-OB as well as OB facilities using the ACOG AIM bundles and providing resources for healthcare staff and patients/families.
- In 2024, THA enhanced their efforts to address healthcare disparities, by organizing in-person implicit bias training sessions sponsored by the March of Dimes, and open to all hospitals. Implicit bias training is an educational program designed to help individuals recognize and address unconscious biases that can influence their behavior, decisions, interactions, and to foster more inclusive and fair treatment for everyone.
- THA has created and distributed "Screening Pregnant and Postpartum Women" posters, which include QR codes for accessing screening tools related to mental health, intimate partner violence, and substance use disorders.
- THA has also procured and distributed Health Resources and Services Administration (HRSA) posters, flyers, magnets, and palm cards featuring the national maternal mental health hotline number, to all 20 participating hospitals.

Maternal Health in Action
Statewide

Tennessee Initiative Perinatal Quality Care

The Tennessee Initiative for Perinatal Quality Care (TIPQC), established in 2008 through a grant from the Governor's Office, is Tennessee's statewide collaborative for perinatal quality improvement. TIPQC brings together hospitals, healthcare providers, payers, families, and communities to drive meaningful change, promote health equity, and enhance the quality of care for Tennessee families throughout pregnancy, delivery, and the postpartum period.

In 2023-2024, TIPQC continued to develop high-quality improvement projects to support the work of local hospital teams, to decrease preventable maternal and neonatal morbidity and mortality across Tennessee.

- The Best for All Learning Collaborative, involving eleven participating hospitals, focuses on delivering respectful patient care, consistently screening for social determinants of health with timely referrals, and improving overall patient care.
- Team Birth is a collaborative initiative between TIPQC and Ariadne Labs aimed at fostering open communication among patients, their support networks, and clinicians throughout the birthing process. In 2023, five hospitals joined this initiative.
- In 2024, TIPQC launched the ACOG AIM Cardiac Conditions in Obstetric Care Quality Improvement Bundle across six participating hospitals. This initiative aims to reduce severe maternal morbidity and pregnancy-related deaths associated with cardiac conditions.
- The Severe Maternal Hypertension project had a sustainment huddle, that provided funding for AWHONN's POST BIRTH Warning Signs Education Program and National Preeclampsia Foundation blood pressure cuff kits to 750 at-risk patients across 25 hospitals.

Cardiac Bundle Info

TIPQC's podcast, "Healthy Mom Healthy Baby Tennessee," is a discussion with medical providers and other industry experts on all aspects of perinatal health. In 2023, 50 podcasts were produced, totaling 115 that are available to listeners.

TIPQC Podcast

Maternal Health in Action

Strategic Initiatives

Maternal health is a top priority in Tennessee, with statewide efforts focused on reducing disparities, improving outcomes, enhancing care access, and lowering maternal mortality through a comprehensive approach to healthier pregnancies and family support.

Severe Maternal Morbidity Project

Severe Maternal Morbidity (SMM) is a term that describes unexpected complications or outcomes during labor and delivery that can lead to serious short- or long-term health effects. It is considered a "near miss" for maternal mortality, as, without timely identification and treatment, it could result in maternal death.

SMM Report

The Tennessee Department of Health (TDH) is currently developing a severe maternal morbidity report. This report will provide key insights into trends, leading SMM causes, disparities, and other contributing risk factors, aiming to guide prevention efforts. TDH intends for the report to reach healthcare providers, clinicians, public health officials, and community organizations and to support collaborative implementation of AIM bundles—evidence-based best practices aimed at reducing preventable causes of SMM and maternal mortality.

Maternal Health Strategic Plan

Maternal Health Strategic Plan

The comprehensive plan outlines goals, strategies, and objectives to enhance maternal health across Tennessee by building on current partnerships and strengths while addressing existing challenges and gaps. Designed as a living document, the MHSP will adapt and evolve as strategies are implemented and evaluated.

The MHSP includes 16 goals divided into four focus areas:

1. Improve access to quality care
2. Strengthen infrastructure and systems
3. Strengthen maternal health workforce
4. Address social drivers of maternal health.

Each goal is supported by one or more strategies to advance statewide maternal health improvements.

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More on Maternal Health

For other projects, success stories, and resources visit Tennessee Department of Health's **Maternal Mortality Review page.**

Maternal Mortality Review

Scan QR code below for a list of maternal health resources:

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