Minnesota Maternal Mortality Report

2017-2021

DEPARTMENT OF HEALTH

Prepared by

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In tribute

The Minnesota Department of Health (MDH) and members of the Maternal Mortality Review Committee acknowledge the 162 people who died while pregnant or within one year of their pregnancy during 2017-2021. Families and communities were deeply impacted by their loss. The committee hopes that understanding the causes of pregnancy-associated deaths in Minnesota will help prevent future generations experiencing these devastating events. MDH and the committee strive for a safer, more just society for our children and families to learn and grow.

Executive summary

This report includes findings from the MDH's Maternal Mortality Review Committee (MMRC) and includes birthing people who died during or within one year after the end of the pregnancy from 2017-2021. This report reviews pregnancy-associated deaths (defined in detail on page 54). Within this category, pregnancy-related deaths are analyzed separately where applicable.

A comprehensive review of these deaths was completed by the committee, which is multidisciplinary and includes diverse members from systems and programs serving birthing people. Based on these reviews, the committee made recommendations aimed at improving policies, programs, systems, practice guidelines, and health care provider services. These recommendations focus on preventing pregnancy-associated deaths and improving health equity and birth outcomes.

There are many factors that determine the health outcomes of pregnant and postpartum people.

The top five leading causes of death in pregnancy-related cases during 2017-2021 are:

1. **Mental health conditions (including substance use disorders)**
2. **Injury**
3. **Infection**
4. **Hemorrhage (excluding aneurysms and cerebrovascular accidents)**
5. **Cardiomyopathy**

In reviewing cases over the past five years, two themes emerged:

1. **Lack of access to care and care fragmentation**
2. **Safety**

Routine care can be challenging and difficult to manage for a mother and new baby. The first several weeks after birth are a profound adjustment with high care and support needs. Care needs to be readily accessible for both the mother and the baby. When health concerns arise, accessible care becomes even more important. Yet, it can be very difficult to get the care that is needed. There are barriers and challenges at every step to receiving care, such as: scheduling difficulties, transportation issues, a lack of providers, and limitations based on insurance status. When a patient has high care needs and access is difficult, care is often not received.

Many patients and health care professionals believe the persistent myth that it is normal to feel unwell (physically and emotionally) after the end of a pregnancy. While pregnancy, birth, and postpartum bring major physical and emotional changes, persistent or severe symptoms should not be considered normal and must not be dismissed. It is important to recognize the difference between typical recovery discomforts and signs that require medical care. This myth leads to complications being ignored or dismissed by the individual, their loved ones, and their health care providers. There are tools available to help educate families and providers about postpartum warning signs, including the Association of Women's Health, Obstetric, and Neonatal Nurses post-birth warning signs.

Currently in Minnesota, it is harder to access care for mental health conditions and substance use disorders than it is to access care for other conditions. The recommendations within this report target many of the barriers and issues families face when in need of care. Specifically, committee members recommend changing the relationship between health care systems and the child welfare system. Consistent with recommendations in the MDH Task Force on Pregnancy Health and Substance Use Disorders report, health care professionals cannot be both trusted confidants and reporters to law enforcement. New models are needed that promote safety, healing, and facilitate access to care.

The way substance use disorders are assessed and treated are infused with bias. Like other leading causes of death, substance use disorder is a treatable disease. Pregnancy brings physical and emotional changes that increase risk for new and pre-existing mental health conditions and substance use disorders.

To have a healthy pregnancy, birth, and postpartum experience, basic needs must be met in a safe and stable environment, free from harm. This includes consistent housing, nutritious food, and freedom from abuse. When a pregnant or postpartum person must spend most of their time and resources trying to meet their basic needs, or their basic needs go unmet, their physical and mental health suffer. The committee recommends that health systems and communities provide robust care and support to women after pregnancy.

Meeting the needs of birthing families and providing high quality care and safety is shared work that should be undertaken by all who are invested in decreasing the number of maternal deaths and in improving health outcomes. While solving these problems is complex because there are many parts of our health care systems that need to be improved, this is a largely solvable problem. Disparities in health outcomes can be shifted by making care easier to receive, improving the care experience, and ensuring the needs of women are met through multiple strategies highlighted throughout the report.

Maternal mortality definitions

To remain consistent with nationwide terminology, MDH uses the Center for Disease Control and Prevention (CDC) definitions of maternal mortality.

Pregnancy-associated death: A death during or within one year of the end of pregnancy, irrespective of cause.

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

Pregnancy-associated but unable to determine pregnancy relatedness: A death during pregnancy or within one year of the end of pregnancy from a cause that could not be determined as pregnancy-related or not pregnancy-related.

Maternal mortality key findings

There were **162 pregnancy-associated deaths** from 2017-2021 in Minnesota.

Of those, **59** were determined to be pregnancy-related.

The state's pregnancy-related mortality ratio for 2021 was **34.1 pregnancy-related deaths per 100,000 births,** which was higher than the national rate of 33.2 pregnancy-related deaths per 100,000 births.

Due to the small number of annual deaths in Minnesota, single-year ratios should be interpreted with caution.

Pregnancy-associated deaths (all deaths within one year of pregnancy)

- While people who are Non-Hispanic Black and giving birth (12%) and people who are American Indian and giving birth (1.4%) are a small portion of the birthing population, they are disproportionately represented among the pregnancy-associated deaths, making up 24.1% (n=39) and 17.3% (n=28) of the deaths respectively.
- Fifty-eight percent (n=94) of pregnancy-associated deaths occurred to residents of the seven-county metro area and 42% (n=68) occurred to residents outside of the metro region.
- Most pregnancy-associated deaths (67.9%, n=110) occurred between six weeks after the pregnancy to one year postpartum, while 21% (n=34) occurred during pregnancy, 9.3% (n=15) occurred 0-42 days postpartum, and 1.8% (n=3) occurred on the day of delivery.
- Mental health conditions, including substance use disorder, were the leading cause of pregnancy-associated deaths. Substance use disorder was identified as the primary cause of death in 24.7% (n=40) of cases and a contributing factor for nearly half (49.3%, n=80) of all pregnancy-associated deaths, meaning it often co-occurred with other causes of death.

Pregnancy-related deaths (deaths within one year of pregnancy where pregnancy was the aggravating factor)

- Of the 59 pregnancy-related deaths, 95% (n=56) were determined to be preventable.
- Over half (54.2%, n=31) of the pregnancy-related deaths occurred 43 days to one year postpartum.

Pregnancy-associated but NOT related (deaths within one year of pregnancy where pregnancy was NOT the aggravating factor)

- More than three quarters of the pregnancy-associated but NOT related deaths occurred 42-365 days postpartum (79%, n=78).
- Mental health conditions (36.4%, n=36) and injury (36.4%, n=36) were the leading causes of death in pregnancy-associated not related deaths.

Top pregnancy-related recommendations

The review committee developed recommendations that should happen at the system, community, facility, provider, and patient levels to reduce pregnancy-related deaths. Below are the highlighted recommendations. In addition to health care systems and provider practices, the committee also recognizes social determinants such as housing, nutrition, and safety as critical to maternal health outcomes. Recommendations therefore span both health care and community supports.

COMMUNITIES:

- Provide robust follow-up and emotional, physical, and mental health support to families after pregnancy. There is an urgent call for postpartum doulas, home visitors, and other wraparound services to support the mental, emotional, and physical needs of new parents.
- Ensure the safety of all families during the perinatal period. Families need access to stable housing, childcare, transportation, and other basic needs, which are essential for improving health outcomes.

SYSTEMS:

- Integrate mental health support into prenatal and postpartum care, particularly for individuals with a history of mental illness, substance use disorders, or trauma. This includes direct referrals to mental health and substance use disorder services, providing early interventions, and ensuring that mental health concerns are addressed with the same level of priority as physical health issues.
- Integrate culturally responsive care that considers the diverse needs of various racial and ethnic groups, including Black and American Indian people. Health care systems should train staff on cultural humility (culturally responsive care) and implicit bias, integrate interpreters, and provide care that is respectful of cultural differences.
- Law enforcement and first responders should partner with health and social service systems to ensure that individuals in crisis are referred to supportive, non-punitive services. Examples of crises include unhoused families, acute substance use effects in the perinatal population, and intimate partner violence.
- Policy makers should, in partnership with systems, expand the perinatal health care workforce, particularly for health care professionals who can provide mental health and substance use disorder treatment services, social services, and culturally sensitive care. Calls for funding scholarships and loan repayment programs for those entering these fields are frequent.

Recommendation summary and examples

Top themes from the recommendations:

1. **Increasing access to care and reducing care fragmentation**
2. **Ensuring safety for families during the perinatal period**

A difference can be made for families in Minnesota by:

- Improving continuity and coordination of care.
  - Example: Provide care coordination services during the perinatal period to anyone with risk factors for the leading causes of maternal mortality.
- Integrating mental health support before, during, and after pregnancy.
  - Example: Embed mental health care providers and social workers into prenatal practices and facilitate connections between these providers and patients early in care.
- Ensuring equity and addressing systemic racism through person-centered, trauma-informed care delivery models.
  - Example: Integrate evidence-based implicit bias mitigation strategies into health care delivery, including accountability mechanisms for all types of health system employees.
- Enhancing workforce development and training.
  - Example: Engage in prevention efforts including providing education on warning signs and when to seek care, integrate community health services in emergency department care, and provide culturally specific outreach using mobile clinics.
- Advocating for policy changes that ensure comprehensive, accessible, and equitable care for all pregnant and postpartum individuals, especially those from marginalized communities.
  - Example: Public officials should advocate for and implement policies that address the social determinants of health such as housing, neighborhood and built environment, and economic stability

Putting recommendations into practice

MDH was awarded one year of funding through the CDC's Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE-MM) program to address maternal mortality in Minnesota. MDH collaborated with four organizations to implement recommendations previously published from the Maternal Mortality Review Committee into action.

From Nov. 1, 2023 - Sept. 29, 2024, the organizations worked toward implementing three committee recommendations:

1. Increased funding for communities disproportionately impacted by maternal mortality to address the intersection of substance use disorder and mental health conditions, and historical racism.
2. Supported community led organizations to develop and integrate trauma-informed models of care focused on culture and empowerment.
3. Supported statewide continuous quality improvement models.

Grantee features

There are four grantees featured throughout the report:

- The Minnesota Perinatal Quality Collaborative
- Mewinzha Ondaadiziike Wiigaming
- Wayside Recovery Center
- The Division of Indian Work

The report also highlights several community organizations funded through the Enhancing Outcomes for Pregnant/Postpartum Families Impacted by Substance Use Disorder Grants.

Maternal mortality overview

This report provides an overview of the pregnancy-associated deaths that occurred in Minnesota from 2017-2021. It describes the demographic characteristics of pregnancy-associated deaths in Minnesota and summarizes the causes of death and factors contributing to these deaths. Also included in this report are the Maternal Mortality Review Committee's recommendations which are aimed at providers, facilities, systems, and communities. The committee's recommendations point to actionable ways to improve outcomes for birthing people and reduce the numbers of preventable pregnancy-associated deaths in Minnesota.

Committee structure

The committee is comprised of expert professionals involved in the care of pregnant people. Professions represented include the following: obstetrics/gynecology, maternal fetal medicine, family medicine, midwifery, nursing, social services, forensics, social work, Tribal liaisons, substance use disorder experts, emergency medicine, racial equity research, and health policy. This diverse group ensures a multifocal approach to pregnancy-associated death reviews, providing recommendations to address multiple components of an individual's health and care experience. The committee includes expert professionals and community representatives, ensuring that both clinical expertise and lived experience shape the review process. MDH staff evaluate committee membership annually and post open positions to ensure a mix of perspectives and expertise on the committee.

Committee history

Pregnancy-associated deaths have been reviewed for decades in Minnesota. From 1950-1985, a physician-only pregnancy-associated death review committee studied pregnancy-related deaths and provided critiques and recommendations for medical care in Minnesota. The committee disbanded in 1985 after concluding that pregnancy-related deaths had reached an irreducible minimum in terms of preventability. Minnesota continued its commitment to pregnancy-associated death surveillance activities from 1985-2011. However, minimal work was done to create systemic recommendations to reduce or prevent pregnancy-associated deaths.

Legislation authorizing the Minnesota Commissioner of Health to conduct pregnancy-associated death studies was enacted in 2001. From 2012 to 2017, the commissioner convened a multi-disciplinary pregnancy-associated death review committee forming the Minnesota Maternal Mortality Review Project. The project consistently convened prior to the summer of 2017 and followed similar logic and strategies used in reviews today. In 2019, Minnesota implemented the CDC's Maternal Mortality Review Information Application to assist with standardizing the review process. Though reviews completed before 2019 were like the current process, information from those reviews is not included in this report. Since 2019, identification and reporting of pregnancy-associated deaths has significantly improved. A retrospective report focusing on the work completed in 2013-2016 may be released later.

In 2021, the authorizing statute was amended to formally establish the Maternal Mortality Review Committee, specify the composition of the committee, and clarify and expand data sources related to the birthing person's death (MINN. STAT. 145.901 (2021)). As a result, the committee is now composed of 25 voting members appointed by the Minnesota Commissioner of Health.

Maternal mortality review process

Pregnancy-associated death identification and narrative

MDH's Child and Family Health Division and Office of Vital Records collaborate to identify pregnancy-associated deaths by using vital records and enhanced surveillance methods. The Office of Vital Records follows methods recommended by the U.S. CDC to identify deaths of birthing people. Methods used include at least one of the following:

Pregnancy check box selected on the death certificate indicating:

- Pregnant at the time of death
- Not pregnant, but pregnant within 42 days of death
- Not pregnant, but pregnant 43 days to one year before death
- Medical coding indicating a pregnancy-related cause of death, and/or
- Linking a birth or fetal death certificate within one year of the date of a pregnancy-associated death.

In addition, Child and Family Health staff may review obituaries and publicly available online sources to identify deaths that may not appear in vital records. These reviews are conducted with strict attention to privacy and used only to supplement formal record sources. Staff receive reports of maternal deaths through the Maternal Death Reporting Form (PDF). Almost all cases are identified through the collaboration between Office of Vital Records and Child and Family Health.

Using the identified pregnancy-associated death information, Child and Family Health staff request records to capture the person's life events leading up to and including their death.

Information requested includes, but is not limited to, hospital records of a birth, a fetal death, facility where birth or death occurred, medical examiner, prenatal care by a provider/clinic, law enforcement interaction, and other pertinent health information.

The information is abstracted by a health care professional into the Maternal Mortality Review Information Application, a secure CDC database system, and it is summarized into a pregnancy-associated death narrative, which is a detailed story of the person's experiences prior to their death. For privacy reasons, the narrative does not include the names of decedents, support people, or health care providers and is presented to the committee to start the discussion of how to prevent future deaths.

The committee review of the pregnancy-associated death utilizes the Committee Decision form from Maternal Mortality Review Information Application. The committee addresses the following for each pregnancy-associated death, including potential contributing social and structural factors such as discrimination and access to care:

- Was the death pregnancy-related?
- What was the underlying cause of death?
- Was the death preventable?
- What factors contributed to the death?
- What recommendations may help prevent future deaths?

MDH staff regularly evaluate the processes that support comprehensive reviews of pregnancy-associated deaths. MDH integrates several tools into the review process, including the Discrimination Assessment and Social Determinants of Health tool and the consensus criteria for pregnancy-related suicide and unintentional overdose (Smid et.al., 2023). These ongoing quality improvement efforts help the committee more accurately determine pregnancy-relatedness and identify specific recommendations for action.

Improvements in the committee processes

Maternal mortality staff and contractors regularly evaluate processes and implement changes to improve the overall quality of the review process. Recent process improvements include developing and implementing a process for next-of-kin interviews, using data quality reports to ensure complete data collection, and education for committee members on a range of topics that impact committee work. MDH staff developed a process to contact family members, with informed consent, and to use interviews respectfully when writing case narratives. This ensures that family voices are included while protecting privacy and minimizing harm.

In telling the stories of descendants to committee members, the committee recognizes that records from facilities/entities do not make up the entire story and the voice of loved ones offers perspective and information that is not available elsewhere. To include the voice of loved ones in the case narrative, MDH staff have developed a process to contact family members, complete interviews, and use those interviews when writing case narratives.

Data collection is an important function of committee staff, and it allows us to analyze and share information about the state of maternal health in Minnesota. A recently developed data quality protocol will help ensure that the data about maternal death cases is as accurate and complete as possible within our database.

One of the reasons Maternal Mortality Review Committees have become an essential source of data on maternal death in the United States is the interdisciplinary structure of the reviews. Having the perspectives of a range of professions provides a deeper, more complete understanding of the circumstances around the death. When committee members or staff recognize a need for additional education, MDH provides members access to workshops, resources, simulation, and contact with subject matter experts.

Limitations to the 2017-2021 data

Pregnancy-associated cases can have a variety of records that contribute to the case narrative. As listed above, records can come from facilities, providers, social services, vital statistics, and medical examiners. Child and Family Health staff request all possible known records associated with a case to develop a complete story for committee review. However, the committee may not receive all the records requested or be aware of all records potentially pertaining to a case.

The committee reviews deaths of Minnesota residents and almost all cases occur in Minnesota. If a Minnesota resident is identified as a pregnancy-associated death in another state or jurisdiction, Child and Family Health staff work with the vital records and maternal mortality review staff from the state/jurisdiction where the death occurred to obtain charts and information pertinent to the case review.

Since 2017, the Maternal Mortality Review Information Application Committee Decision Form has been updated multiple times and Child and Family Health staff consistently use the most current form when conducting review committee meetings. These revisions have, at times, added or modified categories which can make comparisons over time challenging. For example, in April 2021 the CDC added Pregnancy Mortality Surveillance System codes to include substance use disorder and depressive disorder as mental health conditions.

It is also important to note that overdose deaths can be categorized under more than one category, specifically mental health conditions and injury. Overdose deaths that also have a corresponding substance use disorder diagnosis or are due to suicide are captured under mental health conditions. However, not all overdose deaths have a corresponding substance use disorder diagnosis or other mental health diagnosis. Overdose deaths that are not determined by the medical examiner or the committee to be suicides may be classified as unintentional injuries.

At the state and local levels, data is often suppressed due to small numbers. This means that MDH is not able to report maternal death data at the individual county level. For reporting location, data is combined into State Community Health Services Advisory Committee regions (PDF). Small numbers are suppressed for two reasons:

- MDH is required to protect privacy and confidentiality and must ensure that individuals cannot be identified in the data reported.
- Percentages and rates based on small numbers can fluctuate dramatically over time. These observed differences may appear large but can be due to random variation alone and therefore, not meaningfully (or statistically) different.

For example, a single maternal death in a small county could produce a rate that looks disproportionately high and could risk identifying the family involved. To protect confidentiality, data are combined into regional groups.

Recommendations

For each case review, the committee develops recommendations for change. These recommendations reflect concerns identified in the case and may be directed at communities, systems, facilities, providers, and/or patients and their families. Typically, cases generate multiple recommendations at a variety of levels. The committee's recommendations span both health care practices and broader social determinants of health, recognizing that systemic issues such as housing, child care, and safety directly affect maternal mortality.

The definitions of the levels are:

COMMUNITY:
A grouping based on a shared sense of place or identity - ranges from physical neighborhoods to a community based on common interests and shared circumstances.

SYSTEM:
Interacting entities that support services before, during, or after a pregnancy - ranges from health care systems and payors to public services and programs. Systems include health care delivery systems, law enforcement systems, and policy makers.

FACILITY:
A physical location where direct care is provided - ranges from small clinics and urgent care centers to hospitals with trauma centers.

PROVIDER:
An individual with training and expertise who provides care, treatment, and/or advice.

PATIENT/FAMILY:
An individual before, during or after a pregnancy, and their family, internal or external to the household, with influence on the individual.

Pregnancy-associated deaths

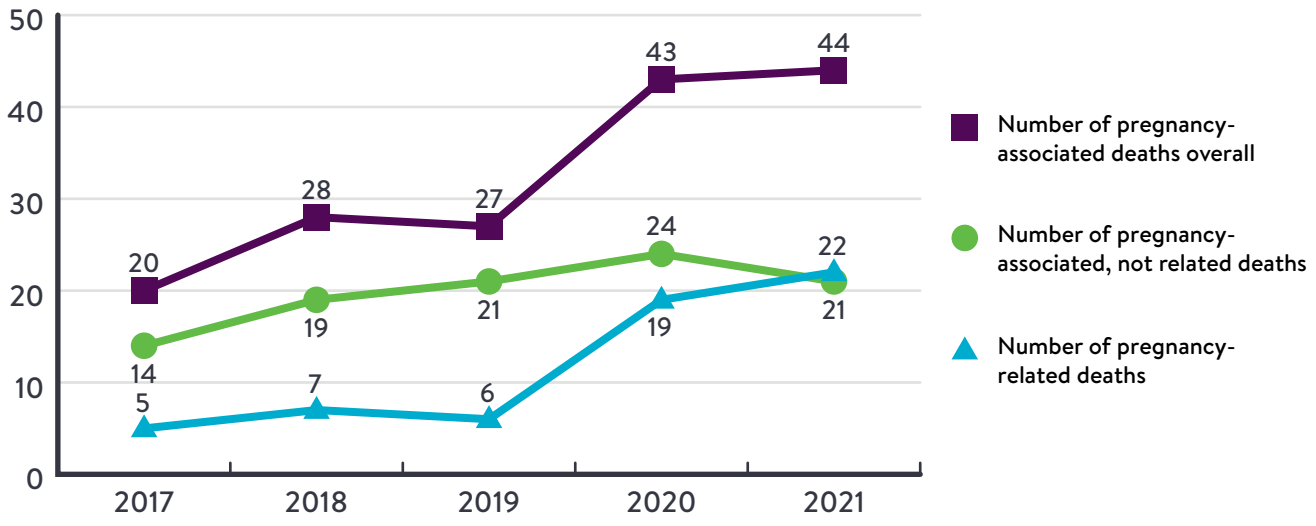
From 2017-2021, 162 pregnancy-associated deaths were reviewed by the review committee in Minnesota. **Figure 1** shows the number of pregnancy-associated deaths from 2017-2021. Overall, the number of pregnancy-associated deaths per year have increased from 20 (2017) to 44 (2021). Improvements in case identification likely contributed to higher counts; however, additional factors (e.g., access to care, COVID-19 impacts) may have also played a role. See **Limitations to the 2017-2021 data** section (page 14) for details about case identification.

Pregnancy-related deaths also increased from a low of five deaths in 2017 to a high of 22 deaths in 2021 **(Figure 1)**.

This significant increase in pregnancy-related deaths is likely due to several factors, including:

- Improved case identification
- The review committee's improved ability to recognize the connection between pregnancy, stress, and the exacerbation of substance use disorder and violence that can result in maternal death; and
- Impacts of COVID-19 on the health care system which likely resulted in reduced or delayed access to care (especially prenatal care) and impacted health outcomes (Diamond-Smith et al, 2023).

Figure 1: Number of maternal deaths over time, 2017-2021



Information regarding the demographics of the 162 pregnancy-associated deaths reviewed by the committee in Minnesota can be found in **Table 1**. Most pregnancy-associated deaths (74.1%, n=120) were of birthing people between 20-34 years of age, followed by those 35 years and older (23.5%, n=38). Birthing people under 20 years of age had the lowest percentage of deaths (2.5%, n=4). An analysis of the highest level of education achieved reveals that most cases had more than high school education (42.2%, n=68), followed by high school education (37.8%, n=62), and less than high school education (19.9%, n=32).

Table 1: Demographics of pregnancy-associated deaths, 2017-2021 | n=162

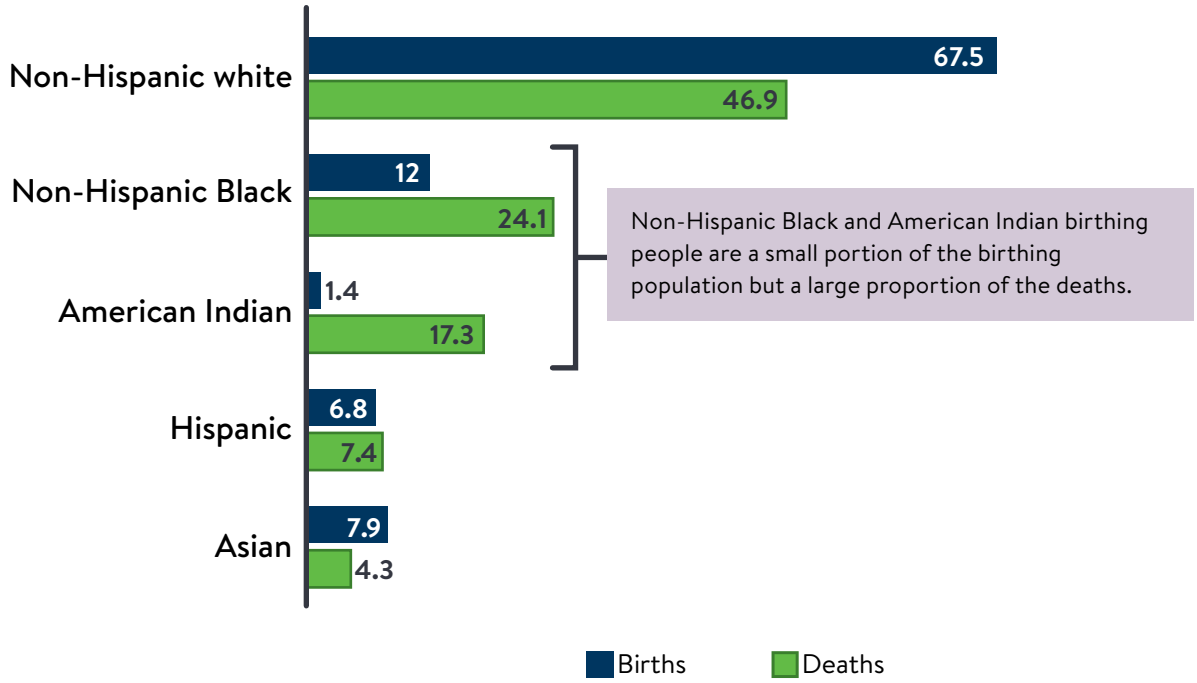
Age	Number of pregnancy-associated deaths	Percent (%)
<20	4	2.5
20-34	120	74.1
>34	38	23.5
Race/ethnicity	**Number of pregnancy-associated deaths**	**Percent (%)**
Non-Hispanic White	76	46.9
Non-Hispanic Black	39	24.1
American Indian	28	17.3
Hispanic	12	7.4
Asian	7	4.3
Education	**Number of pregnancy-associated deaths**	**Percent (%)**
Less than high school education	32	19.9
High school education	62	37.8
More than high school education	68	42.2
Residence	**Number of pregnancy-associated deaths**	**Percent (%)**
Metro	94	58
Central	23	14.2
Northwest	13	8
Northeast	9	5.6
South Central	8	4.9
Southeast	7	4.3
Southwest	4	2.5
West Central	4	2.5

Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Figure 2 displays the race/ethnicity of all pregnancy-associated deaths in comparison to births occurring in the state. The highest percentage of deaths were among Non-Hispanic White people (46.9%, n=76), followed by 24.1% (n=39) among Non-Hispanic Black, 17.3% (n=28) American Indian, 7.4% (n=12) Hispanic, and 4.3% (n=7) Asian.

However, to give these numbers context, the percentages can be compared to the percent of births by race. Most births occurred among Non-Hispanic White people (67.5%), followed by 12% Non-Hispanic Black, 7.9% Asian, 6.8% Hispanic, and 1.4% American Indian people. The data shows a higher percentage of deaths among Non-Hispanic Black and American Indian birthing people when compared to the percent of births for each group. This data is not reflective of location of birthing person's individual birthplace, thus, U.S.-born and foreign-born birthing people are combined in this data.

Figure 2: Proportion pregnancy-associated deaths vs proportion of births, 2017-2021
Total deaths=162 | Total live births=329,917



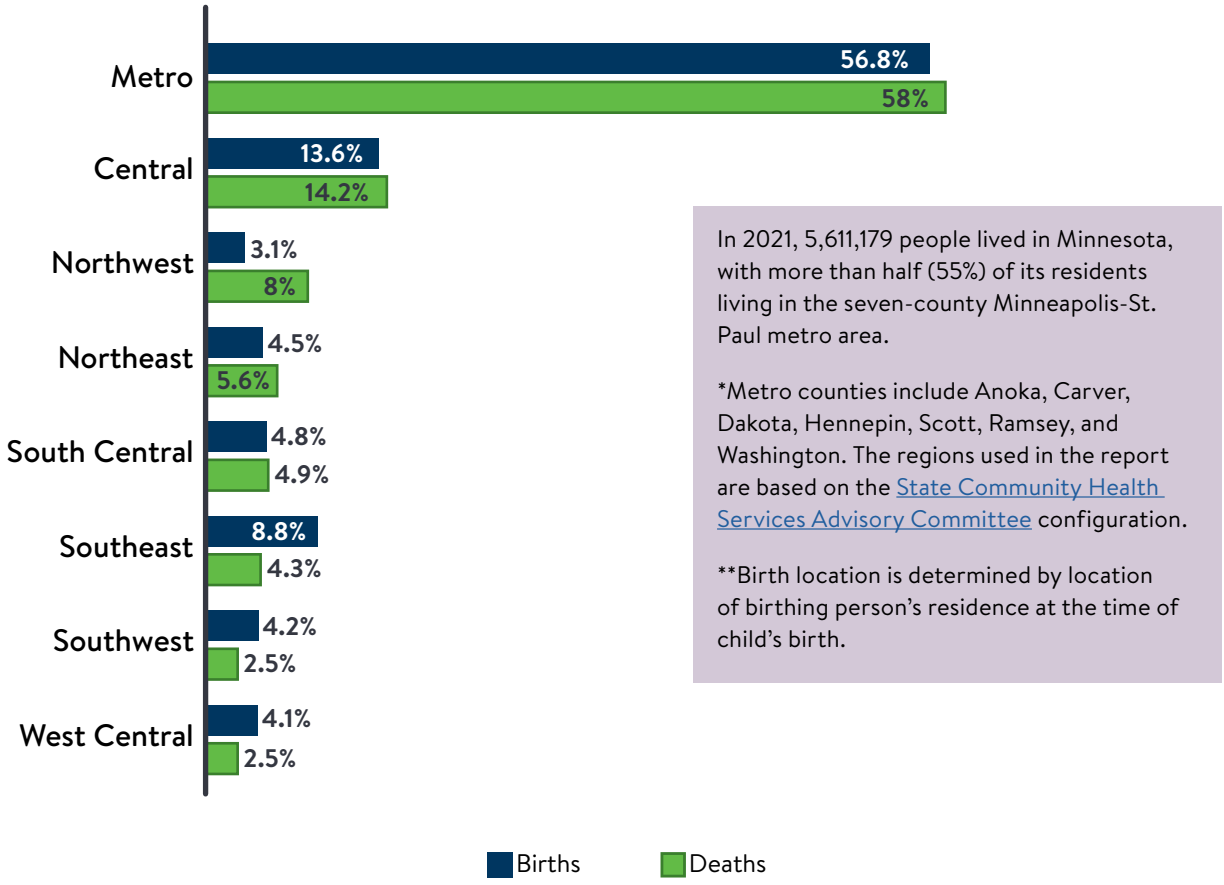
Note: Total percentages of births may not total 100%, as unknown category is not displayed.
Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.
Number of live births used in the denominators to calculate rates: Non-Hispanic White=222,737; Non-Hispanic Black=39,681; American Indian=4,594; Hispanic=22,555; Asian=25,904

**Race/ethnicity is determined from the birth certificate or fetal death record when available. If no birth/fetal death record was available, then race/ethnicity is determined from the death certificate. If the deceased was of mixed race and American Indian was one of the racial groups noted, then the death was classified as Non-Hispanic American Indian. Otherwise, if a death was mixed race and included Non-Hispanic Black, then the death was classified as Non-Hispanic Black. Hispanic can include any racial group.*

Location of residence

From 2017-2021, most pregnancy-associated deaths occurred in the seven-county metro region (58%, n=94). The central region of the state had 14.2% (n=23) of the pregnancy-associated deaths, and the northwest region had 8% (n=13). **Figure 3** compares the proportion of pregnancy-associated deaths occurring in each region** to the proportion of births occurring by region. The metro, northwest, and northeast regions have a higher percentage of deaths compared to percentage of births.

Figure 3: Pregnancy-associated deaths vs. proportion of Minnesota births by location, 2017-2021
Total deaths=162 | Total live births=329,917



In 2021, 5,611,179 people lived in Minnesota, with more than half (55%) of its residents living in the seven-county Minneapolis-St. Paul metro area.

*Metro counties include Anoka, Carver, Dakota, Hennepin, Scott, Ramsey, and Washington. The regions used in the report are based on the State Community Health Services Advisory Committee configuration.

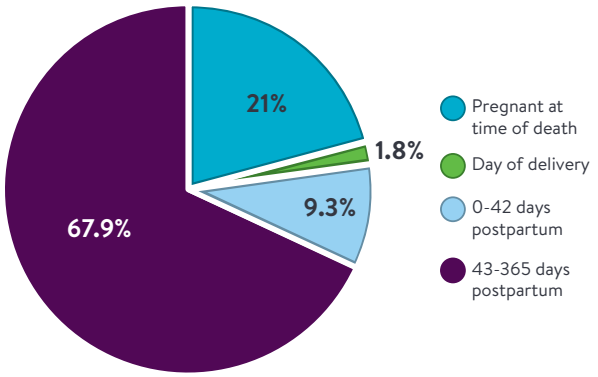
**Birth location is determined by location of birthing person's residence at the time of child's birth.

Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution. Metro=187,356; Central=45,028; Northwest=10,276; Northeast=14,930; South Central=15,865; Southeast=29,114; Southwest=13,804; West Central=13,482

Pregnancy status

From 2017-2021, 68% (n=111) of pregnancy-associated deaths occurred 43-365 days postpartum or six weeks to one year after birth. Of the deaths, 21% (n=34) occurred while the individual was pregnant and 9.3% (n=14) occurred 0-42 days postpartum. Just under 2% (n=3) of the deaths occurred on the day of delivery **(Figure 4)**.

Figure 4: Timing of pregnancy-associated deaths, 2017-2021 | n=162



As of July 1, 2022, Minnesota's Medical Assistance program extended postpartum coverage from three months to 12 months for pregnant people enrolled in Medical Assistance or Children's Health Insurance Program-funded Medical Assistance. This change occurred after the 2017-2021 study period.

Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Leading causes of death for pregnancy-associated deaths

The leading causes of death for the 162 identified pregnancy-associated deaths from 2017-2021 are listed in **Table 2**. Mental health conditions were the leading cause of pregnancy-associated death (31.9%, n=50), which includes deaths of suicide and overdose/poisoning related to substance use disorder. In addition, there were 43 deaths caused by injury (27.4%), which include motor vehicle deaths, poisoning/overdose, suicides, and homicides. Categorization for cause of death and manner of death is based on the Maternal Mortality Review Committee's determination. While a small number of suicides were categorized as injuries by the committee (n=3), most suicides were included in the mental health conditions category (n=15). Thirteen deaths were related to cancer (8.3%), 10 related to infection (6.4%), and six were related to hemorrhage (3.8%).

Table 2: Top five causes of death for pregnancy-associated deaths, 2017-2021

Cause of death	Number of pregnancy-associated deaths	Percent (%)
Mental health conditions	50	31.9
Injury	43	27.4
Cancer	13	8.3
Infection	10	6.4
Hemorrhage (excludes aneurysms or cerebrovascular accidents)	6	3.8

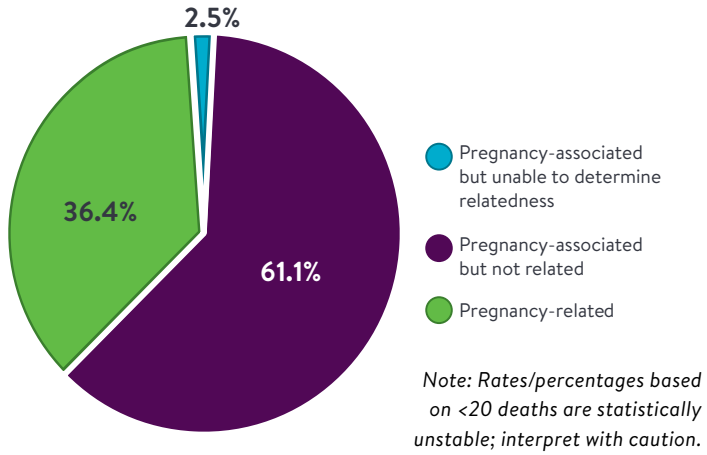
Note: Only top five causes are shown and percentages will not sum to 100. Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Pregnancy-related vs. pregnancy-associated but *not* related

Of the 162 pregnancy-associated deaths identified, the review committee determined the majority, 99 (61.1%) of pregnancy-associated deaths were pregnancy-associated but not related **(Figure 5)**. Due to the small number of deaths, pregnancy-associated but unable to determine relatedness are not discussed in detail to maintain decedent privacy. However, 2.5% (n=4) of the pregnancy-associated cases fell into this category.

The pregnancy-associated mortality ratio (PAMR) allows states to calculate pregnancy-associated death ratios per total number of births occurring in the state and facilitates comparisons to other states or national data. This is calculated by dividing the number of pregnancy-associated deaths by the number of live births occurring for each year and then multiplying by 100,000.

Figure 5: Pregnancy-relatedness, 2017-2021 | n=162



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

For 2017-2021, there were 162 pregnancy-associated deaths resulting in an overall PAMR of 49.1 pregnancy-associated deaths per 100,000 live births. **Table 3** shows the PAMR by race/ethnicity. The PAMR for American Indian birthing people was over 12 times higher than the statewide rate. PAMR could not be calculated for Asian pregnant people due to small number of deaths.

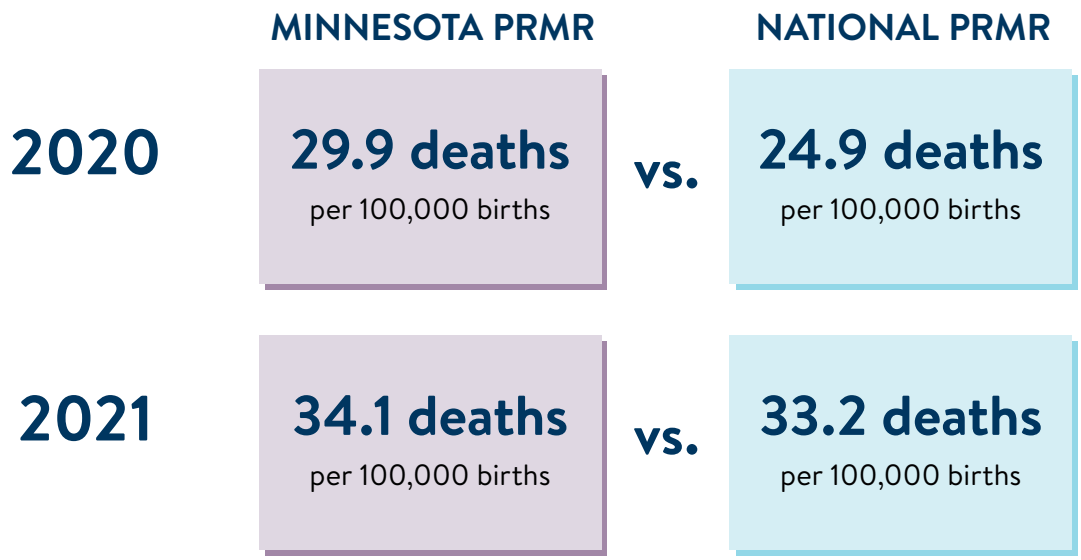
Table 3: Pregnancy-associated mortality ratio (PAMR) | race/ethnicity, 2017-2021 | n=162

Race/ethnicity	Number of pregnancy-associated deaths	Pregnancy-associated mortality ratio (per 100,000 live births)
Non-Hispanic White	76	34.1
Non-Hispanic Black	39	98.3
American Indian	28	609.5
Hispanic	12	53.2
Asian	7	NA

Note: Classification rules prioritize American Indian and then Non-Hispanic Black for mixed race entries; results are not disaggregated by U.S.- vs foreign-born. Rates/percentages based on <20 deaths are statistically unstable; interpret with caution. Number of live births used in the denominators to calculate rates: Non-Hispanic White=222,737; Non-Hispanic Black=39,681; American Indian=4,594; Hispanic=22,555.

The pregnancy-related mortality ratio (PRMR) can be calculated by taking the number of identified pregnancy-related deaths, dividing by the number of live births for the year, and then multiplying by 100,000. In 2020 and 2021, the number of pregnancy-related cases surpassed the threshold (minimum of 10 cases needed) to calculate the PRMR.

In 2020, the Minnesota PRMR was 29.9 deaths per 100,000 births, compared to a national PRMR of 24.9 deaths per 100,000 live births. In 2021, Minnesota's rate rose to 34.1 deaths per 100,000 births compared to the national PRMR of 33.2, which was again higher than the national rate (CDC Pregnancy Mortality Surveillance System website).



To calculate the PRMR for race/ethnicity, data was combined over the five-year period. From 2017-2021, there were 59 pregnancy-related deaths resulting in a PRMR of 17.9 pregnancy-related deaths per 100,000 live births. **Table 4** shows the PRMR for each race/ethnicity category from 2017-2021. The PRMR for American Indian birthing people was over 12 times higher than the statewide rate. The PRMR could not be calculated for Hispanic and Asian pregnant people due to small number of deaths in each group.

Table 4: Pregnancy-related mortality ratio (PRMR) | race/ethnicity, 2017-2021 | n=59

Race/ethnicity	Number of pregnancy-related deaths	Pregnancy-related mortality ratio (per 100,000 live births)
Non-Hispanic White	22	9.9
Non-Hispanic Black	16	40.3
American Indian	10	217.7
Hispanic	6	NA
Asian	5	NA

Note: Classification rules prioritize American Indian and then Non-Hispanic Black for mixed race entries; results are not disaggregated by U.S.- vs foreign-born. Rates/percentages based on <20 deaths are statistically unstable; interpret with caution. Number of live births used in the denominators to calculate rates: Non-Hispanic White=222,737; Non-Hispanic Black=39,681; American Indian=4,594;

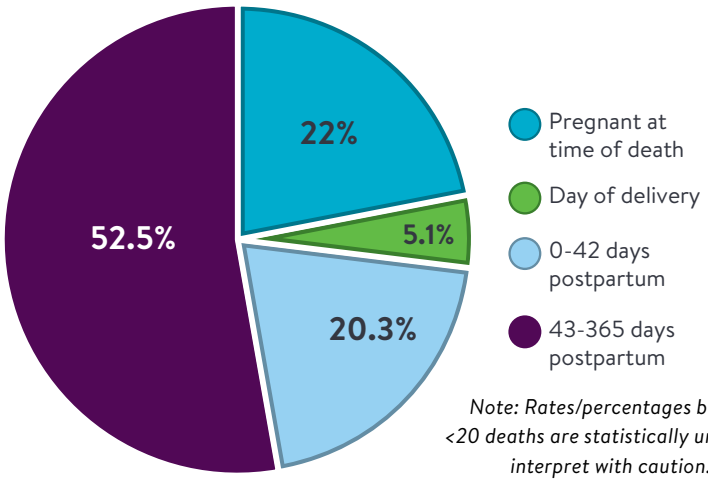
Pregnancy-related deaths

When examining maternal deaths, pregnancy-related deaths have been the focus of surveillance and analysis, both nationally and globally. However, because of the relatively small number of pregnancy-related deaths in Minnesota, it has been difficult to identify trends over time or calculate rates for specific subgroups and populations. In spite of this limitation, the MMRC was still able to identify contributing factors among the pregnancy-related deaths that target areas for improvement.

Timing of death

In 2017-2021, among the 59 pregnancy-related deaths identified by the committee, over half occurred 43-365 days postpartum (52.5%, n=31). Twenty-two percent (n=13) were pregnant at the time of death, 20.3% (n=12) were pregnant within 42 days of death, and 5.1% (n=3) died on the day of delivery **(Figure 6)**.

Figure 6: Timing of pregnancy-related deaths, 2017-2021
Total deaths=59



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution. Due to rounding, percentages do not total 100.

The committee reviews all pregnancy-associated deaths to determine preventability. Of the identified 59 pregnancy-related deaths, 95% (n=56) were deemed preventable by the committee. The remaining 5% of cases (n=3) were deemed not preventable.

Underlying causes of pregnancy-related deaths

The causes of pregnancy-related death are shown in **Table 5**. Mental health conditions, including substance use disorders, were the leading cause of death, followed by injuries and infection. In this report, mental health conditions and substance use disorders are the leading cause of death in Minnesota accounting for 28.8% (n=17) of pregnancy-related deaths. In the previous report, mental health and substance use disorders accounted for 11.2% of all pregnancy-related deaths.

This change likely reflects that:

- Other conditions are being better managed, so they may be decreasing in number.
- Committee members and perinatal health experts have a better understanding of the connection between mental health conditions, substance use disorders, and pregnancy-relatedness.
- There may be a true increase in these types of cases. Due to the small number of pregnancy-related deaths from 2017-2021, no clear underlying trends in pregnancy-related deaths could be identified, therefore data is not depicted.

Table 5: Top five causes of pregnancy-related deaths, 2017-2021

Cause of death	Number of pregnancy-related deaths	Percent (%)
Mental health conditions (including substance use disorder)	17	28.8
Injury	8	13.6
Infection	7	11.9
Hemorrhage (excludes aneurysms or cerebrovascular accidents)	5	8.5
Cardiomyopathy	4	6.8

Note: Only top five causes are shown and percentages will not sum to 100. Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Grantee feature: Minnesota Perinatal Quality Collaborative

The Minnesota Perinatal Quality Collaborative is a 501(c)(3) nonprofit organization dedicated to improving the standard of care for birthing people, their families, and infants through quality improvement initiatives. By partnering with over 59 stakeholders across Minnesota, the collaborative provides a unique platform for health care facilities to track evidence-based interventions, rapidly collect data, and implement systemic changes to advance equitable, high-quality perinatal health outcomes.

Through a partnership with MDH's Enhancing Reviews and Surveillance to Eliminate Maternal Mortality grant, the collaborative pursued four strategic objectives from Dec. 26, 2023, to Sept. 29, 2024, to support the implementation of the Maternal Mortality Review Committee strategies. As part of this effort, the collaborative developed a Perinatal Health Initiatives Assessment that was distributed to all birthing facilities in Minnesota. The assessment aimed to evaluate each facility's alignment with the review committee's recommendations, gauge interest in quality improvement initiatives, and assess familiarity with the collaborative's work. With a 100% response rate, the survey results will guide the committee's strategic planning, strengthen facility engagement in statewide initiatives, and ensure the adoption of high-quality interventions that improve perinatal outcomes across the continuum of care.

Pregnancy-associated but *not* related deaths

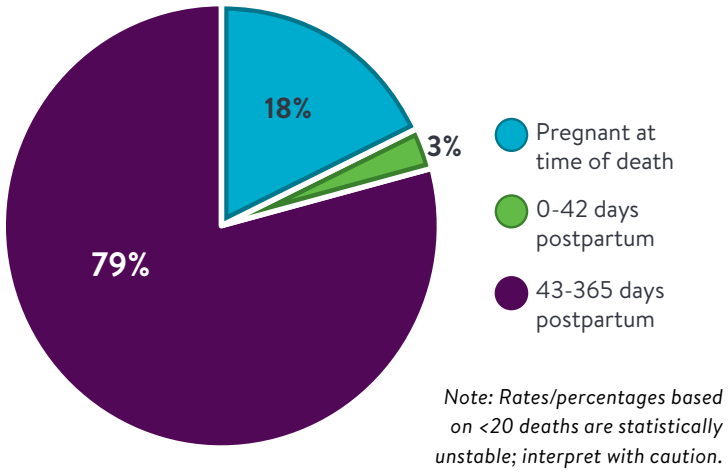
Among the 162 pregnancy-associated deaths in Minnesota from 2017-2021, 61.1% (n=99) were determined to be pregnancy-associated but not related to the pregnancy. Though pregnancy did not cause the death, reviewing and applying population health principles to these deaths allows community partners and policymakers the opportunity to identify areas of improvement.

The majority of pregnancy-associated but not related deaths were determined preventable (91%; n=90), while the remaining were determined by the committee to be not preventable (9%; n=9).

Timing of death

Figure 7 depicts the timing of death for pregnancy-associated but not related deaths, with 79% (n=78) occurring 43-365 days postpartum. It is important to note that during this 2017-2021 reporting period, Medical Assistance ended six weeks postpartum and individuals were not covered during the 43-365 days postpartum timeframe. Minnesota extended Medicaid postpartum coverage from three months to 12 months July 2022.

Figure 7: Timing of pregnancy-associated but *not* related deaths, 2017-2021 | Total deaths=99



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Leading causes of death for pregnancy-associated but not related deaths

Table 6 depicts the five identified leading causes of death by pregnancy-associated but not related deaths. Mental health conditions and injuries were identified as the leading causes with 36 (36.4%) pregnancy-associated deaths each. Cancer was the third leading cause with 11 deaths (11.6%). Infection and neurologic/neurovascular conditions (excluding cerebrovascular accidents) had the lowest number of deaths with three cases each (3.2%).

Table 6: Top five causes of death for pregnancy-associated but *not* related deaths, 2017-2021

Cause of death	Number of pregnancy-associated but not related deaths	Percent (%)
Mental health conditions (including substance use disorder)	36	36.4
Injury	36	36.4
Cancer	11	11.6
Infection	3	3.2
Neurologic/neurovascular conditions (Excluding cerebrovascular accidents)	3	3.2

Note: Only top five causes are shown and percentages will not sum to 100. Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Grantee feature: Mewinzha Ondaadiziike Wiigaming

Located in Northern Minnesota, Mewinzha Ondaadiziike Wiigaming is the region's only Native provider that integrates both western and traditional knowledge into practice throughout the holistic health journey of Native community members. Mewinzha staff are Anishinaabe women who bring lived experience, clinical knowledge/training, and Anishinaabe medicine and healing to encompass maternal and infant holistic health care services.

With funding provided by MDH, Mewinzha incorporated Anishinaabe and western maternal health practices to their perinatal health services. For example, Mewinzha adapted and contextualized the March of Dimes Supportive Pregnancy Care curriculum with Anishinaabe cultural knowledge on perinatal topics. In addition, Mewinzha implemented monthly prenatal and postpartum group sessions with 14 families Lastly, Mewinzha piloted a comprehensive meal delivery service to perinatal families in spring of 2024. This service offered families education on preparation and nutrition supported by Mewinzha's registered dietitian. By the end of this funding period, twenty families were enrolled in the meal delivery program.

Mewinzha worked closely with clients, community members, and elders to evaluate their services and programs to ensure services and care that are Indigenous and community centered.

COVID-19

The COVID-19 pandemic impacted pregnant and birthing families in Minnesota. Pregnancy increases the risk of severe complications from COVID-19 and the increased risk continues into the postpartum period. There is a greater risk for cesarean birth, pre-eclampsia/eclampsia, and blood clots. People who have health concerns (including diabetes, high blood pressure, and lung diseases) may also be at increased risk.

Characteristics of the pregnancy-associated deaths, where COVID-19 is the underlying cause, are presented in **Table 7**. During the COVID-19 pandemic, there were five pregnancy-associated deaths due to COVID-19. Three of those deaths were determined to be pregnancy-related and two were pregnancy-associated, not related. All five cases lived in the seven-county Twin Cities metro area. One decedent was pregnant at the time of death, two were pregnant within 42 days of their death, and two were pregnant 43 days to one year before their death.

Table 7: Characteristics of pregnancy-associated deaths | COVID-19, 2017-2021 | n=5

Year	Number	Percent (%)
2020	2	40
2021	3	60
Pregnancy-relatedness	**Number**	**Percent (%)**
Pregnancy-related	3	60
Pregnancy-associated, but not related	2	40
Timing of death	**Number**	**Percent (%)**
Pregnant at time of death	1	20
Pregnant within 42 days of death	2	40
Pregnant 43 days to 1 year before death	2	40
Location of residence	**Number**	**Percent (%)**
Metro area	5	100

Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Top recommendations related to COVID-19

The review committee developed recommendations that should happen at the system, community, facility, provider, and patient levels to reduce maternal deaths due to COVID-19. Below are the highlighted recommendations.

COMMUNITIES AND SYSTEMS:

- Address the pandemic from a social determinants of health lens, applying lessons learned to be prepared for the next pandemic. Planning should address the intersectionality of adequate housing, health care, childcare, education, employment- addressing basic individual rights for a healthy population.
- Incorporate lessons learned from the COVID-19 pandemic to their emergency preparedness plans, including lessons related to social determinants of health. Specifically, future planning should include an infrastructure to provide services (food, shelter, and medication) when individuals need to quarantine during pandemic.
- Policy makers should develop clear guidelines that can be used during outbreaks and pandemics.

FACILITIES:

- Engage in prevention efforts including providing education on warning signs and when to seek care, integrate community health services in emergency department care, and provide culturally specific outreach using mobile clinics.
- Ensure that high risk people are aggressively assessed at the start of and throughout care.

PROVIDERS:

- Recommend appropriate vaccines to reduce morbidity and mortality.

Violence in maternal mortality

MDH was awarded an Office on Women's Health grant to address pregnancy-associated deaths by violence in Minnesota. Over the course of five years (2021-2026), the grant aims to:

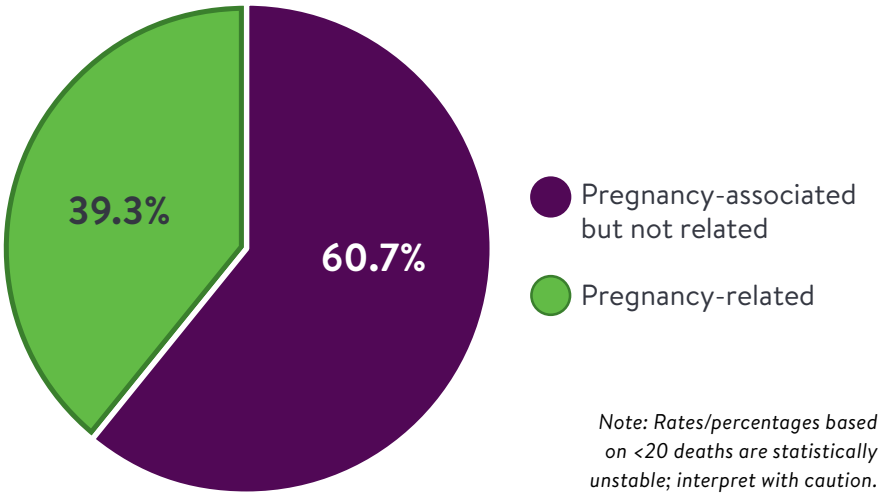
- Expand programs that review, identify, and track maternal deaths due to violence (suicide, homicides, or could not be determined).
- Implement evidence-based interventions to improve outcomes and reduce deaths among pregnant and postpartum women due to violence.
- Implement process and outcomes evaluation and develop a plan to sustain evidence-based interventions.

Through this project, the review committee established a Maternal Violent Death Review subcommittee. Subcommittee members were tasked with reviewing pregnancy-associated deaths related to violence to develop recommendations for prevention and intervention. Violent deaths were defined as cases whose manner of death on the death certificate was suicide, homicide, or unknown. While the full committee reviewed the violent maternal deaths occurring from 2017-2019, the subcommittee reviewed the violent maternal deaths occurring from 2020-2021.

Overall, 28 pregnancy-associated deaths occurring in 2017-2021 were due to violence. The committee determined that 60.7% (n=17) of these violent deaths were pregnancy-associated but not related and 39.3% (n=11) were pregnancy-related **(Figure 8)**. Nearly 68% (n=19) of these pregnancy-associated deaths occurred in the postpartum period (43 days to one year after pregnancy), 28.6% (n=8) occurred while pregnant, and 3.6% (n=1) was pregnant within 42 days of death **(Figure 9)**. The majority of violent deaths were due to suicide (64.3%, n=18) while the remainder were homicides (35.7%, n=10) **(Figure 10)**.

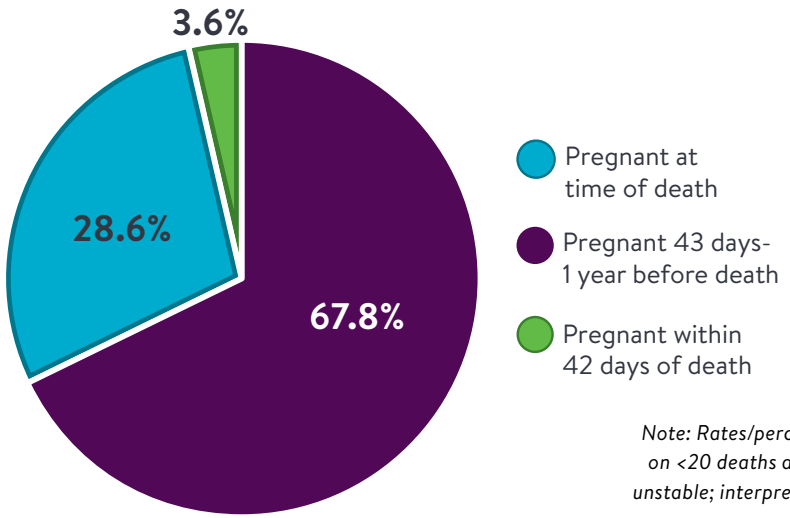
Violent maternal deaths

Figure 8: Violent maternal deaths | pregnancy relatedness, 2017-2021
Total deaths=28



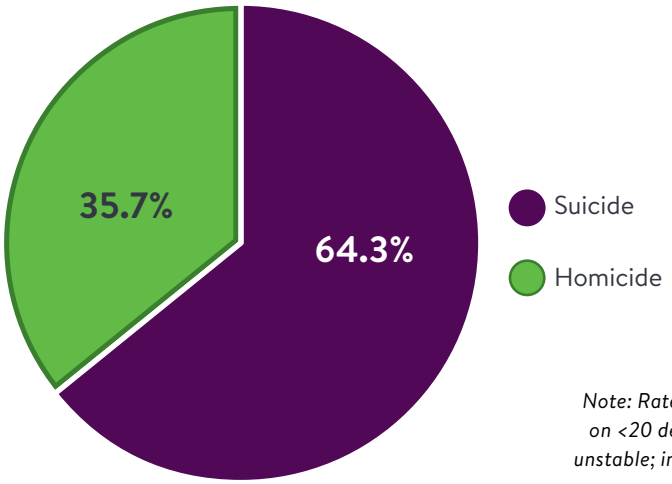
Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Figure 9: Violent maternal deaths | timing of death, 2017-2021
Total deaths=28



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

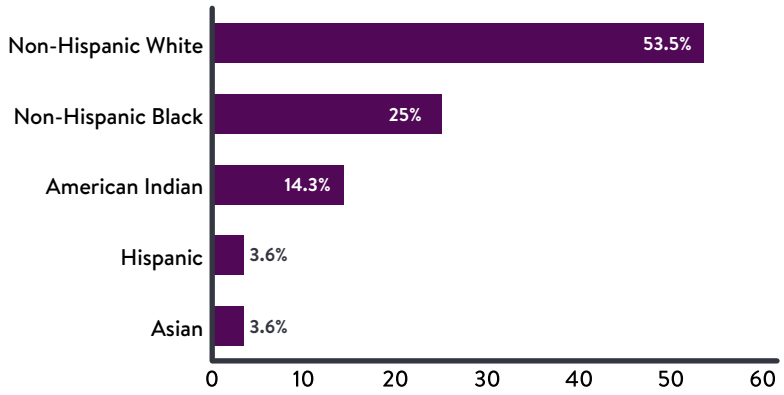
Figure 10: Violent maternal deaths | manner of death, 2017-2021
Total deaths=28



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

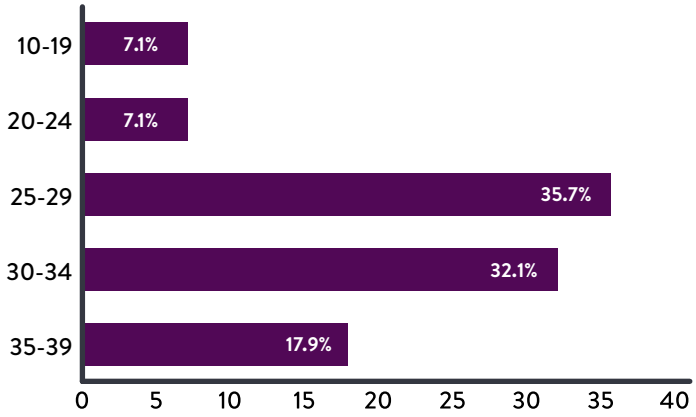
Demographics such as race/ethnicity, age, and location of residence of violent maternal deaths, are displayed in **Figures 11, 12, and 13**. Of the 28 pregnancy-associated deaths reviewed by the committee, more than half of the deaths were of Non-Hispanic White pregnant/birthing people (53.5%, n=15), followed by Non-Hispanic Black (25%, n=7), American Indian (14.3%, n=4), and Asian and Hispanic birthing people (both 3.6%, n=1) **(Figure 11)**. The highest percentages of violent maternal deaths occurred between the ages of 25-29 (35.7%, n=10) and 30-34 (32.1, n=9), followed by birthing people aged 35-39 (17.9%, n=5) and 10-19 and 20-24 years of age (both 7.1%, n=2) **(Figure 12)**. Lastly, over 57% (n=16) of the violent maternal deaths occurred in the Metro, followed by the Central (10.7%, n=3), Northeast (10.7%, n=3), and South Central (10.7%, n=3) regions of Minnesota. Southeast, Southwest, and West Central had lower percentages (both 3.7%, n=1) **(Figure 13)**.

Figure 11: Violent maternal deaths | race/ethnicity, 2017-2021
Total deaths=28



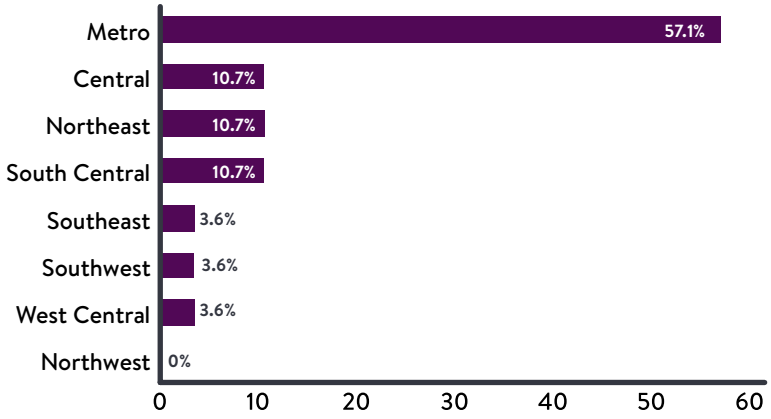
Note: Classification rules prioritize American Indian and then Non-Hispanic Black for mixed race entries; results are not disaggregated by U.S.- vs foreign-born. Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Figure 12: Violent maternal deaths | age, 2017-2021
Total deaths=28



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution. Percentages may not total 100 due to rounding

Figure 13: Violent maternal deaths | location of residence, 2017-2021
Total deaths=28



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Top recommendations related to violent maternal deaths

The review committee developed recommendations that should happen at the system, community, facility, provider, and patient levels to address violent pregnancy-associated deaths. Below are the highlighted recommendations (see the full list of recommendations on page 43).

COMMUNITIES AND SYSTEMS:

- Improve access and quality of mental health and substance use disorder services. This may include increasing access to mental health providers, especially perinatal and postpartum specialists, increasing patient access to substance use disorder treatment, and providing peer support.
- Public officials should invest in and sustain funding for violence prevention programs, including restorative justice programs for intimate partner violence.
- Collaborate with health care systems, public health agencies, insurance providers, doulas, public health nurses, and community health workers, to develop and incorporate community-led approaches to improve birthing people's access to care and receive smooth care coordination during and after pregnancy.

FACILITIES:

- Provide early postpartum visits within the first two weeks for patients with mental health diagnoses including substance use disorders. Work with the birthing person to schedule postpartum follow-up planning and coordination of care.
- Track and develop a follow-up plan to address discriminatory and biased behavior and/or events reported by patients and staff for quality improvement and accountability purposes.

Substance use and mental health

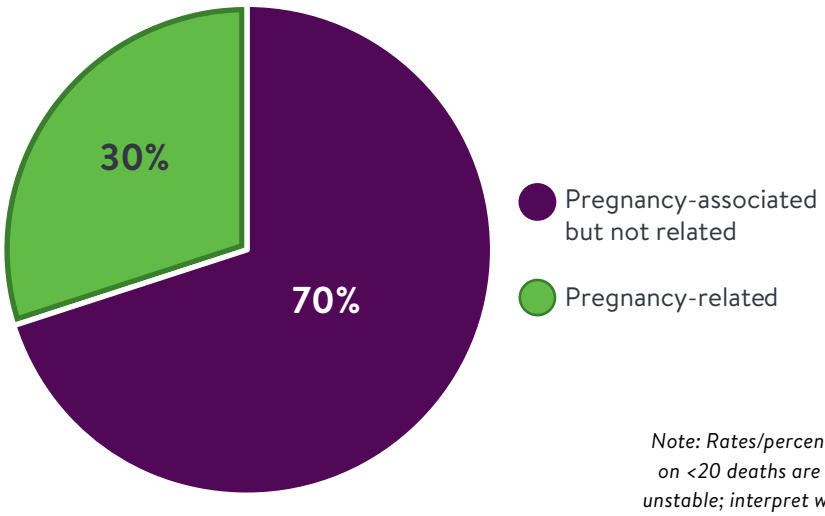
Substance use disorder is a medical condition where the use of substances adversely impacts a person's health and life, including the inability to stop or limit use. Substances can be medications including drugs (both prescribed and non-prescribed) and alcohol. Substance use disorder is closely linked to mental health conditions. This is treatable and it is crucial to address mental health needs as part of treatment.

In Minnesota, substance use disorder is a significant contributing factor in pregnancy-associated deaths.

Overall, of the 162 cases, the committee determined that substance use disorder contributed to nearly half (49.3%, n=80) and was determined to be the underlying cause of death in 24.7% of cases (n=40).

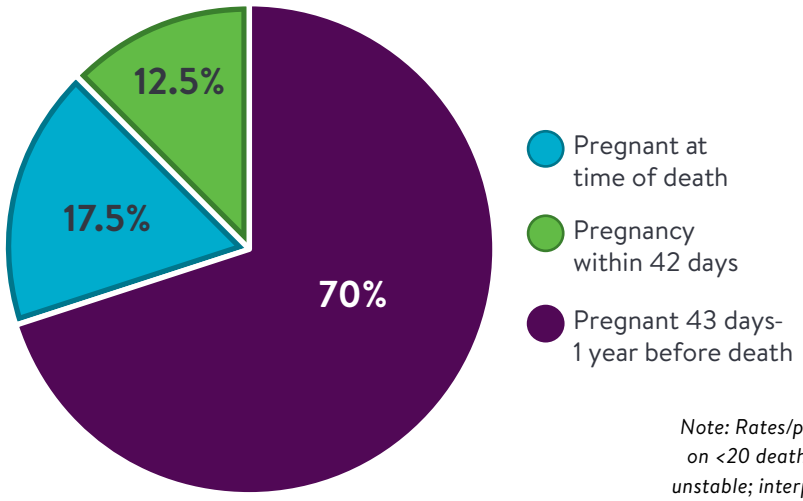
Most of the deaths due to substance use disorder were determined by the committee to be pregnancy-associated but not related (70%, n=28), while 30% (n=12) were determined to be pregnancy-related **(Figure 14)**. Additionally, **Figure 15** shows that most deaths attributed to substance use disorder occurred 43 days to one year after the pregnancy ended (70%, n=28), while 17.5% (n=7) occurred at time of death, and 12.5% (n=5) occurred within 42 days of the pregnancy.

Figure 14: Overall pregnancy-associated deaths with substance use disorder as underlying cause, 2017-2021 | Total deaths=40



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

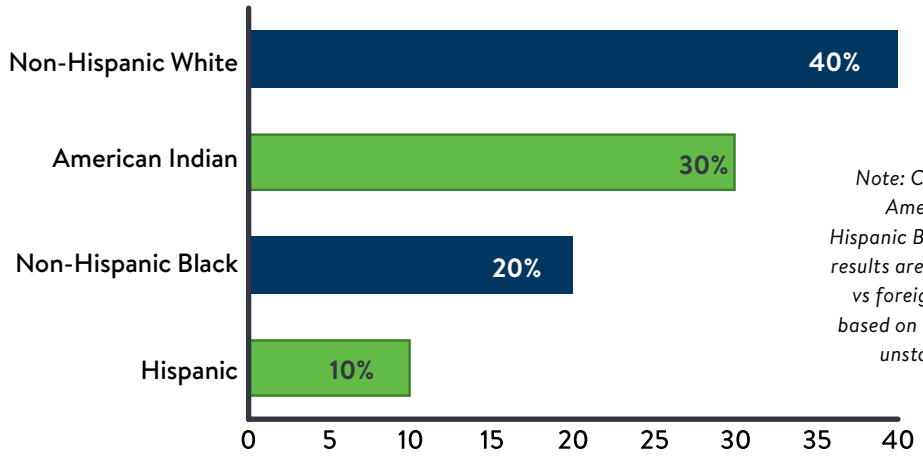
Figure 15: Timing of deaths with substance use disorder as underlying cause, 2017-2021 | Total deaths=40



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

The race/ethnicity data where substance use disorder was the underlying cause of death is displayed in **Figure 16.** The highest percentage of deaths were Non-Hispanic White (40%, n=16), followed by American Indian (30%, n=12), Non-Hispanic Black (20%, n=8), and Hispanic (10%, n=4).

Figure 16: Race/ethnicity among deaths with substance use disorder as underlying cause, 2017-2021 | Total deaths=40



Note: Classification rules prioritize American Indian and then Non-Hispanic Black for mixed race entries; results are not disaggregated by U.S.- vs foreign-born. Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

The committee recognizes the complex intersection of the medical system and child welfare system, in which accessing care also means exposing one's family to the risk of parent child separation. Patients who want treatment risk losing their children in the process of seeking help. Health care providers are mandated reporters and parental substance use must be reported in some cases.

Top recommendations related to substance use and mental health

The review committee developed recommendations at the system, community, facility, and provider level to address substance use and mental health. Below are the highlighted recommendations.

The committee strongly recommends:

Health systems and policy makers should increase access to trauma-informed care delivered to families and widely expand the implementation of harm reduction strategies across perinatal care environments.

COMMUNITIES AND SYSTEMS:

- Implement universal health care coverage that includes comprehensive reproductive health care.
- Address underlying contributing factors of substance use disorder including implementing housing first policies, implementing financial support for pregnant/postpartum families (including a universal basic income), providing for basic needs including housing, food, and high quality free/affordable childcare. One example of a universal basic income is the City of St. Paul (PDF).
- Increase the quality of care within health care systems through expanded mental health resources, wrap around care, improved care coordination, improved screening and assessment practices for mental health conditions and substance use disorders, and strengthening the referral networks for mental health and substance use disorder providers.

FACILITIES:

- Increase access to all types of substance use disorder care including family-based treatment facilities, peer recovery support, telehealth, acute care substance use disorder treatment beds, and integrate the initiation and ongoing treatment of substance use disorder into perinatal care with sustainable funding and workforce development.

PROVIDERS:

- Implement universal screening for substance use disorders including alcohol use disorder, mental health conditions, and tobacco use. Providers should use validated perinatal specific tools when possible.
- Engage in robust follow up of referrals, particularly with medication management and counseling, and referrals to other mental health programs, especially when medication adjustments are made.

Grantee feature: Wayside Recovery Center

Wayside Recovery Center (formerly Wayside House) has addressed substance use disorders in Minnesota for many years. Over its long history, Wayside has expanded the continuum of care to meet the needs of women, children, and families in Minnesota through family-centered, multi-generational approaches. Wayside's Family Treatment Center in Minneapolis is one of only four providers in Minnesota offering family residential treatment, which provides pregnant and parenting birthing people with the option of seeking residential treatment while avoiding separation from their children.

Wayside's comprehensive approach integrates mental health, nursing, care coordination, medication assisted treatment, parenting education, and case management with substance use disorder treatment. Focused on breaking the inter-generational cycle of trauma and addiction, Wayside provides children's services to offset the impact of parental substance use including case management, early childhood developmental screening, and quality childcare.

Wayside served 312 pregnant or parenting people with substance use or co-occurring disorders over the project period, most with complex needs and barriers to recovery. Wayside's primary focus in this project was building workforce capacity to serve this population. Strategies included addressing workforce shortages and promoting diversity and retention by offering nontraditional employment pathways for staff to advance in the field. Through project support, three Wayside staff completed Moral Reconation Therapy and Accelerated Resolution Therapy training, enabling Wayside to offer these best-practice modalities at all residential and outpatient sites. Wayside also supported new graduates entering the field through paid internships and professional supervision to gain experience working with high-risk and underserved populations. Three clinically licensed staff received support to become Board-Approved Supervisors of LADC/LPCC/dual licensure candidates; and six graduate interns seeking LADC or LPCC licensure completed internships.

Discrimination

MMRCs across the United States use a set of definitions to guide conversations about discrimination in maternal death cases. Examples included below do not represent actual Minnesota cases:

Discrimination: Treating someone less or more favorably based on the group, class or category they belong to resulting from biases, prejudices, and stereotyping. This can include discrimination related to race, obesity, substance use disorder, religion, language and ableism, or any combination of these. It can manifest as differences in care, clinical communication and shared decision-making. Further, data from the Minnesota Pregnancy Risk Assessment Monitoring System showed that birthing people who experienced racial discrimination during prenatal care, labor, or delivery were also less likely to receive their postpartum checkup (MDH, 2024).

Example: A person who is pregnant and obese is interested in preventing complications and avoiding an unnecessary cesarean section. Several providers see the patient and none offer to refer her to nutrition counseling or a care coordinator who could connect her to pregnancy safe exercise classes. She planned to use the free doula program at her birthing hospital, but none were available and she spent most of her labor without support. As a result, this woman had a cesarean section with a prolonged recovery leading to job loss and decreased income.

Interpersonal racism: Discriminatory interactions between individuals based on differential assumptions about the abilities, motives, and intentions of others and resulting in differential actions toward others based on their race. It can be conscious as well as unconscious, and it includes acts of commission and acts of omission. It manifests as lack of respect, suspicion, devaluation, scapegoating, and dehumanization.

Example: Interpersonal racism happens in interactions between a health care provider (or health care system employee) and a person receiving care. A Black woman in labor arrives at a hospital reporting severe pain and symptoms of preeclampsia, such as headache, high blood pressure, and swelling. The attending nurse, influenced by implicit racial bias, dismisses her pain, assuming she is exaggerating or being dramatic. Despite her repeated complaints, her symptoms are not properly investigated or escalated. As a result of her symptoms being ignored, her condition is not identified as early as it could have been; she and her baby have more significant health consequences.

Structural racism: The systems of power based on historical injustices and contemporary social factors that systematically disadvantage people of color and advantage White people through inequities in housing, education, employment, earnings, benefits, credit, media, health care, criminal justice, etc.

Example: Structural issues happen regardless of an individuals need for care. For example, a person wants to get health care for their depression, but there are no providers that take their insurance within 75 miles of their home. Their depression goes untreated and becomes severe in the postpartum period and when they become suicidal, there are no inpatient units with beds for them. Often there are fewer providers and facilities covered by insurance held by Black and American Indian persons which means these groups are more likely to experience challenges accessing care. This problem is seen on federally recognized Tribal lands that have been historically under-resourced. Inequitable distribution of health care resources is a systemic problem that can be addressed through changes in health care policies.

When the committee reviews cases, members look for any of the above types of discrimination. When the committee votes on whether discrimination was a contributing factor, their voting options are: Yes/Probably/No/Unknown. In this report, we follow national reporting methods and combine "Yes" and "Probably." While committee members do not vote on the type of discrimination in the case (i.e. if it was racial, weight stigma, or gender based, etc.), they regularly monitor for discrimination in cases and develop recommendations to address these concerns. Committee members understand that the mechanisms of discrimination occur both systemically and within individual interactions, and in many cases, these are happening simultaneously. Discrimination is not an isolated event, and it shows up in multiple ways and multiple times over the course of perinatal care.

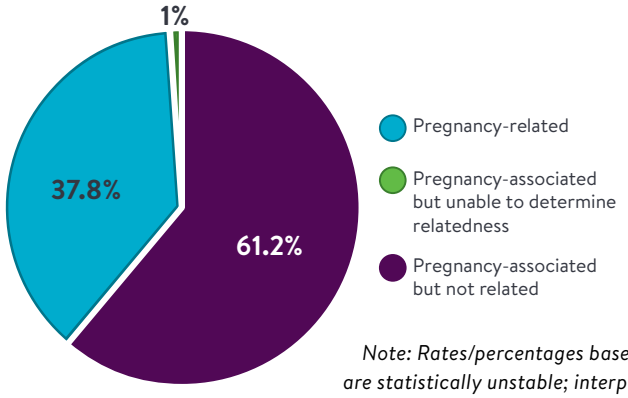
When a patient feels discriminated against, it can directly impact their care as well as their willingness and desire to seek care. Regardless of how the patient experiences it, bias can manifest at individual (clinician), interpersonal (team/setting), and system levels (policy, access, resource allocation).

Characteristics of pregnancy-associated deaths where discrimination was a contributing factor are displayed in **Figures 17 and 18**.

Overall, there were 98 cases where discrimination was a contributing factor, which is 60% of all pregnancy-associated deaths. Committee members determine if discrimination was present through evaluation of the case narrative (which are shaped by all available records and informant interviews) and by applying their knowledge and experience to the narrative.

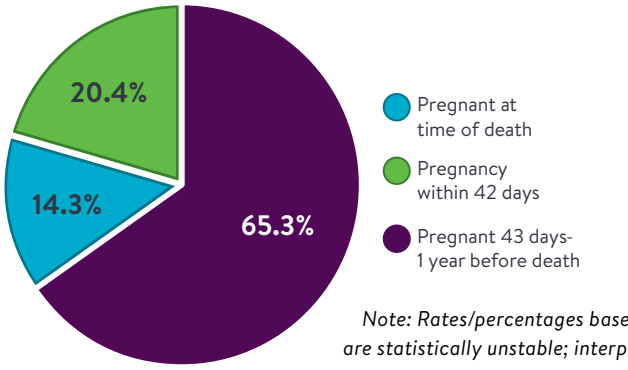
Among those, approximately 61% (n=60) were determined to be pregnancy-associated but not related, while 38% (n=37) were pregnancy-related and 1% (n=1) the committee was unable to determine relatedness. Most cases died 43 days to one year after the pregnancy ended (65.3%, n=64), 20.4% (n=20) were pregnant within 42 days and 14.3% (n=14) were pregnant at the time of death.

Figure 17: Overall pregnancy-associated deaths where discrimination was a contributing factor | Total deaths=98



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Figure 18: Pregnancy-associated deaths where discrimination was a contributing factor Timing of death, 2017-2021 | Total deaths=98

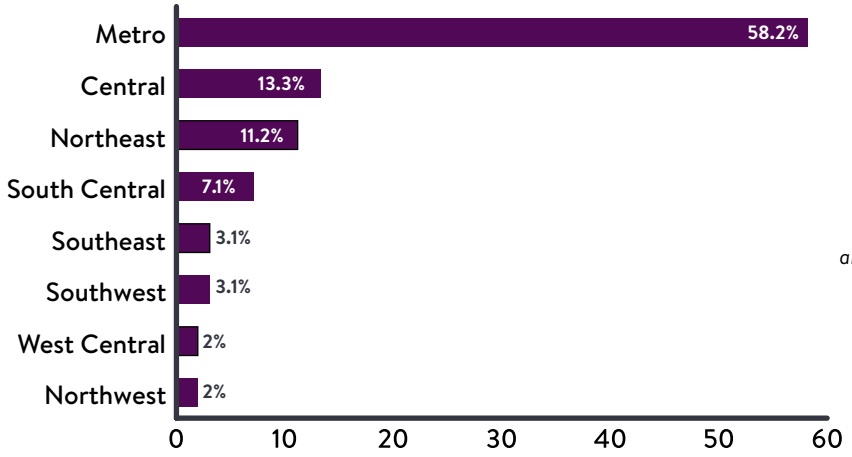


Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Figure 19 shows that most deaths involving some form of discrimination occurred in the Metro region of the state (58.2%, n=57), followed by the Central region (13.3%, n=13), Northwest (11.2%, n=11), Northeast (7.1%, n=7), West Central and Southeast regions (both 3.1%, n=3), and Southwest and South Central (2% each region, n=2).

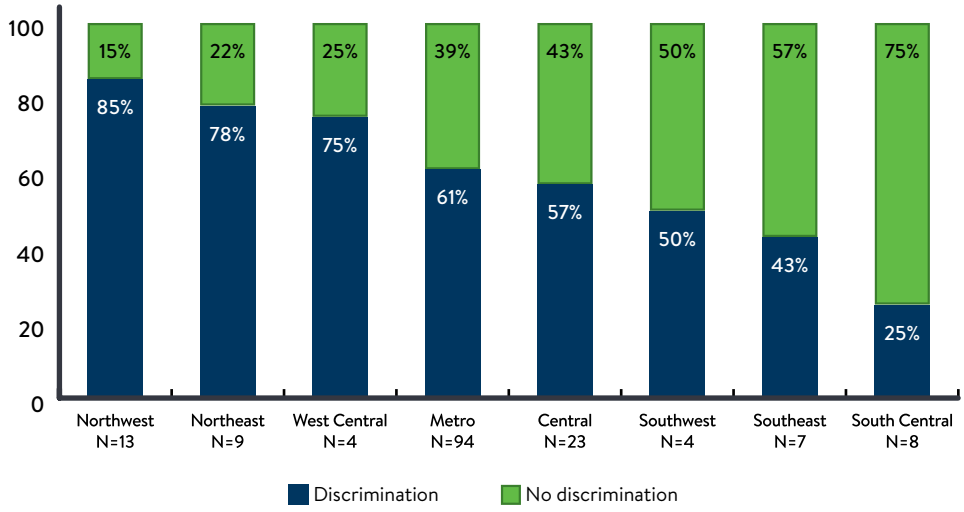
However, when the committee examininge deaths involving discrimination within regions, the Northwest has the highest percentage of cases (85%, n=11), followed by Northeast (78%, n=7), and West Central (75%, n=3). The Metro region was 61% (n=57), followed by Central (57%, n=13), Southwest (50%, n=2), and Southeast (43%, n=3). The area with the lowest percentage of cases involving discrimination was the South Central region with 25% (n=2) **(Figure 20)**.

Figure 19: Overall pregnancy-associated deaths where discrimination was a contributing factor
Location of residence, 2017-2021 | Total deaths=98



Note: Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Figure 20: Percentage of cases where discrimination was present
Within location of residence, 2017-2021



Note: Regions reflects residence at time of death, not necessarily the care location or incident. Within region, % of pregnancy-associated deaths in which discrimination was present. Denominator (N) is the total number of all pregnancy-associated deaths in that region. Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

The highest number of cases where discrimination was a contributing factor were among Non-Hispanic White pregnant people (n=32), followed by Non-Hispanic Black (n=27), American Indian (n=26), Hispanic (n=10), and Asian (n=3) **(Table 8)**.

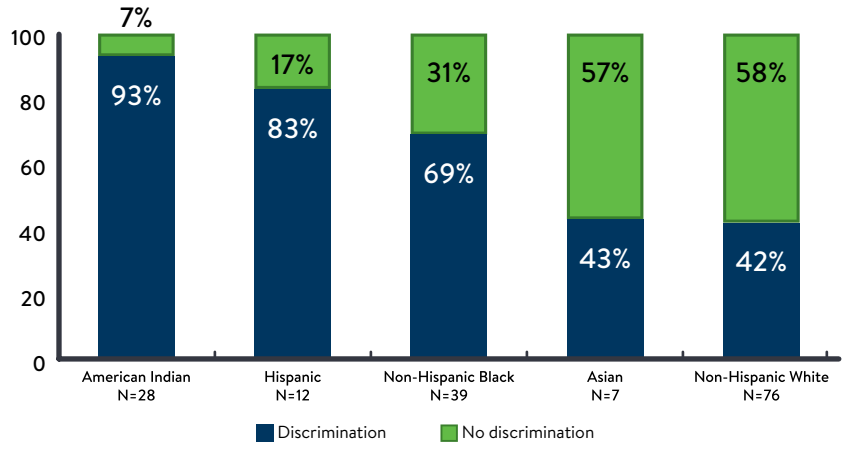
Table 8: Number of cases where discrimination was a contributing factor, 2017-2021 | Total=98

Race/ethnicity	Number of cases
Non-Hispanic White	32
Non-Hispanic Black	27
American Indian	26
Hispanic	10
Asian	3

Note: Classification rules prioritize American Indian and then Non-Hispanic Black for mixed race entries; results are not disaggregated by U.S.- vs foreign-born.

However, a different picture emerges when considering the prevalence of discrimination within each racial ethnic group. American Indian pregnant people experienced the highest rates of discrimination, with 93% (n=26) of all American Indian maternal deaths involving discrimination, followed by Hispanic (83%, n=10), Non-Hispanic Black (69%, n=27), and Asian (43%, n=3), and Non-Hispanic White (42%, n=32) populations **(Figure 21)**.

Figure 21: Percentage of cases by racial group where discrimination was a contributing factor, 2017-2021



Discrimination is treating someone less or more favorably based on the group, class or category they belong to resulting from biases, prejudices, and stereotyping.

Note: Classification rules prioritize American Indian and then Non-Hispanic Black for mixed race entries; results are not disaggregated by U.S.- vs foreign-born. Within each race/ethnic groups % of pregnancy-associated deaths in which discrimination was present. Denominator (N) is the total number of all pregnancy-associated deaths within each group. Rates/percentages based on <20 deaths are statistically unstable; interpret with caution.

Addressing the root causes and sources of bias and discrimination is complex and remains essential work to improve outcomes in maternal mortality. The ongoing experience of bias has health impacts that need to be acknowledged and addressed.

Top recommendations related to discrimination

The review committee developed recommendations that should happen at the system, community, facility, and provider level to address discrimination. Below are the highlighted recommendations.

COMMUNITIES:

- Develop, implement, and support community-based services and interventions including safe housing, access to food, supports for mental and physical wellbeing, supports for belonging, and harm reduction activities.
- Prioritize the health and safety of American Indian and Black birthing people in the ways they identify are needed. Provide resources for American Indian and Black survivors of trauma, racism, and violence.

SYSTEMS:

- Evolve health care systems so that people who need care can readily access high-quality person-centered care. This may include transitioning to trauma-informed models/principles, improving care coordination, and warm handoffs.
- Address root causes of poverty while providing for the basic needs of safe housing, food, and transportation for all Minnesotans.
- Invest in policies that invest in the infrastructure and funding for affordable housing, increased social services, harm reduction, decriminalization, de-incarceration, and healthy built environments. Criminalization increases care avoidance and delays; de-criminalization and harm-reduction approaches reduce barriers to prenatal/postpartum care.

Grantee feature: Division of Indian Work

The Division of Indian Work (DIW) has provided services to the metro area American Indian community since 1952. DIW's mission is to support and strengthen urban American Indian people through culturally based education, traditional healing approaches, and leadership development. Their core work is offered free of charge, revolves around equity for their community and considers the education, cultural supports, and tools they need to build on their inherent strengths and create safe, healthy, and nurturing environments so they can thrive.

The partnership between MDH and the DIW expanded work through the Ninde (My Heart) Indigenous Doula Program, which has 43 certified Indigenous full spectrum perinatal educators who provide informational, emotional, physical, and cultural support to Indigenous families through pregnancy, during labor and birth, and for the postpartum healing period. In addition to being fully certified full spectrum birth doulas, over half of the doulas from the Ninde program are also certified Indigenous lactation counselors and one is also an International Board-Certified Lactation Counselor.

Within a 10-month period, Ninde provided 36 Indigenous identifying families with doula support services. The services included support during all stages of pregnancy and Indigenous birthing education about traditional teachings related to naming ceremonies, birth practices, and parenting. After completing the grant, Ninde reported a total of 36 birthing families were supported through all stages of labor with an outcome of 33 healthy birth outcomes (birthweight of over 5 pounds), and no babies born with the support of the Ninde doula program were removed from home/care of mothers. In addition, 81% of the families they served chose to breastfeed their babies.

Enhancing Outcomes for Pregnant/Postpartum Families Impacted by Substance Use Disorder Grants

The Comprehensive Drug Overdose and Morbidity Prevention Act (Minnesota Statutes 144.0528) created comprehensive drug overdose and morbidity prevention activities, epidemiologic investigations and surveillance, and evaluation, to monitor, address, and prevent drug overdoses statewide through integrated strategies conducted by MDH. The Child and Family Health Division specifically was able to address drug overdose and morbidity in those who are pregnant or have just given birth and their infants and support funding to implement substance use disorder-related recommendations from the maternal mortality review committee.

The Child and Family Health Division at MDH awarded grant funding to four statewide organizations to identify, address, and respond to drug overdose and morbidity in those who are pregnant or have just given birth and their infants through multitiered approaches. The grantees include Avivo, Wright County Community Health Board, Wilderness Health, and Family Service Inc. Rochester. This funding program is a four-year grant cycle that began May 2024 through June 2028. Grantees are to implement two substance use disorder-related recommendations from the 2017-19 Maternal Mortality Review Committee report. In addition, these grantees are able to promote medication for addiction treatment (MAT) options, support programs to provide evidence-based care models for mental health and substance use disorders, and collaborate with interdisciplinary and professional organizations that focus on quality improvement initiatives related to substance use disorder.

Full list of recommendations

Pregnancy-related

COMMUNITIES:

- Provide robust follow-up and emotional, physical, and mental health support to families after pregnancy. There is an urgent call for postpartum doulas, home visitors, and other wraparound services to support the mental, emotional, and physical needs of new parents.
- Ensure the safety of all families during the perinatal period. Families need access to stable housing, childcare, transportation, and other basic needs, which are essential for improving health outcomes.
- Increase community supports, such as domestic violence advocacy groups, peer support services, and home visiting programs, to bridge gaps in health care systems, particularly in populations most impacted by maternal mortality.

SYSTEMS:

- Improve referral systems to support smooth transitions between health care providers, mental health specialists, and community services, ensuring that patients receive the comprehensive care they need across all stages of pregnancy, postpartum, and beyond.
- Implement holistic care models that integrate medical, social, emotional, and cultural support to improve outcomes and ensure that all individuals, regardless of their background or circumstances, have the resources and support they need to thrive during and after pregnancy.
- Initiate care coordination early, using social workers, community health workers, care coordinators, doulas, and mental health professionals to ensure comprehensive care throughout the pregnancy, delivery, and postpartum periods.
- Ensure that individuals receive timely follow-up visits or telehealth check-ins within two weeks of delivery to address health concerns, with an emphasis on mental health and social support.
- Integrate mental health support into prenatal and postpartum care, particularly for individuals with a history of mental illness, substance use disorders, or trauma. This includes direct referrals to mental health and substance use disorder services, providing early interventions, and ensuring that mental health concerns are addressed with the same level of priority as physical health issues.
- Integrate culturally responsive care that takes into account the diverse needs of various racial and ethnic groups, including Black and American Indian people. Health care systems should train staff on cultural humility (culturally responsive care) and implicit bias, integrate interpreters, and provide care that is respectful of cultural differences.
- Actively work toward improving equity in health care and improving access to care for populations that experience the highest health disparities in our state. Systems should ensure equitable treatment and outcomes for these groups, especially in the perinatal population.
- Train and ensure action on implicit bias and trauma-informed care. Health care team members are expected to consistently apply these practices and health care systems are expected to demonstrate accountability to families. A culture of safety and inclusivity is needed to ensure that patients feel heard, respected, and supported.
- Insurance companies should increase perinatal coverage. Examples include higher reimbursement for postpartum care. Improved coverage of perinatal mental health services.

- Insurance companies should revise payment models to reimburse holistic care models.
- Law enforcement and first responders should partner with health and social service systems to ensure that individuals in crisis are referred to supportive, non-punitive services. Examples of crises include unhoused families, acute substance use effects in the perinatal population, and intimate partner violence.
- Policy makers should address access and quality of mental health services, substance use treatment, and postpartum care. Examples include increased coverage for mental health care, increased coverage for all types of substance use disorder treatment and expand programs to train and employ a diverse health care workforce.
- Policy makers should, in partnership with systems, expand the perinatal health care workforce, particularly for health care professionals who can provide mental health and substance use disorder treatment services, social services, and culturally sensitive care. Calls for funding scholarships and loan repayment programs for those entering these fields are frequent.
- Policy makers should increase funding for and access to maternal health programs, including the integration of doulas and postpartum support services into health care coverage.
- Policy makers should increase funding for and access to family centered substance use disorder treatment.
- Policy makers should increase funding for and access to postpartum services covered by Medicaid.

FACILITIES:

- Improve their emergency department protocols for assessing perinatal risk factors and intervening on perinatal health emergencies, such as postpartum hemorrhage, substance use disorders, and mental health crises.
- Improve training and systems for responding to acute situations (e.g., hemorrhage, substance use withdrawal, or trauma) to ensure prompt and effective care.

COVID-19

COMMUNITIES:

- Address the pandemic from a social determinants of health lens, applying lessons learned to be prepared for the next pandemic. Planning should address the intersectionality of adequate housing, health care, childcare, education, employment- addressing basic individual rights for a healthy population.
- Incorporate lessons learned from the COVID-19 pandemic to their emergency preparedness plans, including lessons related to social determinants of health. Specifically, future planning should include an infrastructure to provide services (food, shelter, and medication) when individuals need to quarantine during pandemic.
- Policy makers should develop clear guidelines that can be used during outbreaks and pandemics.

FACILITIES:

- Engage in prevention efforts including providing education on warning signs and when to seek care, integrate community health services in emergency department care, and provide culturally specific outreach using mobile clinics.
- Ensure that people who are high risk are aggressively assessed at the start of and throughout care.

PROVIDERS:

- Recommend appropriate vaccines to reduce morbidity and mortality.

Violence

COMMUNITIES:

- Domestic violence advocacy agencies should increase access to intimate partner violence education and resources for communities, particularly populations at increased risk during pregnancy, through community outreach and engagement opportunities.
- Invest in and provide evidence-based trainings and programs like the Applied Suicide Intervention Skills Training to increase individual and community awareness and skills in suicide prevention/intervention.
- Establish safe, supportive, and private spaces for conversations related to intimate partner violence, ensuring comprehensive resources and services are readily available if needed.
- Provide safe housing for pregnant and postpartum women that offers resources, services, and support around intimate partner violence.
- Collaborate with health care systems, public health agencies, insurance providers, doulas, public health nurses, and community health workers, to develop and incorporate community-led approaches to improve birthing people's access to care and receive smooth care coordination during and after pregnancy.
- Increase community supports and investments in community-led programs that focus on areas such as youth development and enrichment, economic stability, building trust between law enforcement and community members, and support for young families.

SYSTEMS:

- Improve access and quality of mental health and substance use disorder services. This may include increasing access to mental health providers, especially perinatal and postpartum specialists, increasing patient access to substance use disorder treatment, and providing peer support.
- Integrate comprehensive mental health care and services into primary care and prenatal settings.
- Health care systems should improve the referral process, data sharing, and care transitions between health care providers, social services, and different health systems to prevent delays in a birthing patient's care.
- Develop and implement a robust mental health and intimate partner violence referral network.
- Improve access to substance use treatment for birthing patients during the perinatal period.
- Policy makers should implement policies that address the social determinants of health such as housing, neighborhood and built environment, and economic stability.
- Policy makers should implement gun safety laws to include background checks, screenings, and education for those purchasing or handling guns for those around or sharing a household with a birthing person. Gun safety legislation should include restrictions on home manufactured firearms (aka ghost guns) that are privately assembled, lack serial numbers, and are untraceable.
- Policy makers should invest in and sustain funding for violence prevention programs, including restorative justice programs for intimate partner violence.
- Policy makers should aim to better understand the context, attributes, and characteristics of perpetrators of violence to develop targeted prevention interventions. They should also seek to better understand the social norms (attitudes and beliefs) that support the use of harm/violence. For example, invest in domestic abuse transformation programs.

FACILITIES:

- Incorporate doulas, community health workers, and support people in patient coordination of care.
- Assist birthing patients with obtaining insurance coverage if they lose or do not have insurance to reduce the risk of poor health outcomes.
- Provide early postpartum visits within the first two weeks for patients with mental health diagnoses including substance use disorders. Work with the birthing person to schedule postpartum follow-up planning and coordination of care.
- Track and develop a follow-up plan to address discriminatory and biased behavior and/or events reported by patients and staff for quality improvement and accountability purposes.
- Implement universal screenings for firearms in the home during prenatal and postpartum visits. If screenings are positive for firearms in the home, develop a safety plan with the patient.
- Invest in provider and facility staff education on evidence-based intimate partner violence trainings such as the Confidentiality Universal Education and Empowerment Support intervention. Interventions are used to support all staff in a health care setting to have conversations with patients about intimate partner violence.

PROVIDERS:

- Increase education and trainings on topics including, but not limited to, substance use and misuse disorders including alcohol use and stigma/bias around substance use disorder, mental health assessment and crisis intervention, warning signs of suicide, and trauma-informed care.
- Implement standardized universal screenings for mental health and substance use disorder during prenatal and postpartum visits.
- Refer birthing people to mental health support and services following an acute mental health care event.
- Work closely with the birthing person and support services they are receiving to improve communication and coordination of care. This may look like connecting the patient to an identified support group or services and providing specific follow-up instructions and coordination between maternal health providers and addiction treatment providers.

Substance use disorders and mental health conditions

SYSTEMS:

- Implement universal health care coverage that includes comprehensive reproductive health care.
- Change policies to increase coverage of health care services, including substance use disorder treatment in the perinatal period and increase funding for substance use disorder and mental health services.
- Integrate public health nurses, doulas and community health workers into care teams to expand in-home services for families.
- Address underlying contributing factors of substance use disorder including implementing housing first policies, implementing financial support for pregnant/postpartum families (including a universal basic income), providing for basic needs including housing, food, and high quality free/affordable childcare. One example of a universal basic income is the City of St. Paul.

- Address the impacts of historical trauma. Historical trauma is the cumulative impact experienced by people who belong to groups that have been oppressed. Examples of addressing trauma include ongoing training for health care team members about the impact of trauma and trauma-informed practices, system re-design using trauma-informed principles, partnership with patients in the design of systems, partnership with patients in care decisions, the inclusion of culturally specific care and cultural/spiritual advisors.
- Improve data sharing between health care and social service agencies to facilitate care.
- Expand research about the intersection of perinatal care and substance use disorder and mental health conditions, including identifying gaps in care.
- Increase the quality of care within health care systems through expanded mental health resources, wrap around care, improved care coordination, improved screening and assessment practices for mental health conditions and substance use disorders, and strengthening the referral networks for mental health and substance use disorder providers.
- Implement communication campaigns to support listening to birthing mothers and people (examples include the Hear Her campaign and the Association of Women's Health, Obstetrics, and Neonatal Nurses warning signs).

FACILITIES:

- Increase access to all types of substance use disorder care including family-based treatment facilities, peer recovery support, telehealth, acute care substance use disorder treatment beds, and integrate the initiation and ongoing treatment of substance use disorder into perinatal care with sustainable funding and workforce development
- Embed health care professionals who can complete assessments and interventions for mental health and substance use disorder into all places where perinatal care is provided.
- Increase provider education on evidence-based implicit bias mitigation strategies, harm reduction practices, culturally responsive approaches, initiation and maintenance of medications for opioid use disorder, and pain management for people with substance use disorder.
- Increase care for vulnerable patients including faster and easier access to supports, comprehensive therapy for trauma survivors, labor lounges, maternal medical homes, collaboration with prison doula projects, and safe harbor programs for individuals who have or are experiencing abuse and maltreatment.

PROVIDERS:

- Implement universal screening for substance use disorders including alcohol use disorder, mental health conditions, and tobacco use. Providers should use validated perinatal specific tools when possible.
- Increase screening for new onset disease and worsening chronic diseases during the perinatal period.
- Engage in education about substance use and substance use disorders, alcohol use disorder, perinatal mental health, harm reduction practices, and trauma-informed care.
- Engage in robust follow up of referrals, particularly with medication management and counseling, and referrals to other mental health programs, especially when medication adjustments are made.
- Adopt trauma-informed practices, including but not limited to involving patients in care decisions, assessing for historical and current trauma, create emotionally safe care environments, and strengthening collaboration between care team members.
- Have open conversations with patients about harm reduction practices.

Discrimination

COMMUNITIES:

- Develop, implement, and support community-based services and interventions including safe housing, access to food, supports for mental and physical wellbeing, supports for belonging, and harm reduction activities.
- Prioritize the health and safety of American Indian and Black birthing people in the ways they identify are needed. Provide resources for American Indian and Black survivors of trauma, racism, and violence.
- Integrate culturally relevant care, peer support models, and community-integrated models into mental health and substance use care and support.
- Increase supports and community connections to families during the perinatal period.
- Provide high-quality public education campaigns on perinatal health and wellness including substance use disorders, mental health, and harm reduction.
- Increase emergency response and preparedness.

SYSTEMS:

- Take actions to increase trust in health care systems and health care providers.
- Evolve health care systems so that people who need care can readily access high-quality person-centered care. This may include transitioning to trauma-informed models/principles, improving care coordination, and warm handoffs.
- Address root causes of poverty while providing for the basic needs of safe housing, food, and transportation for all Minnesotans.
- Invest in policies that invest in the infrastructure and funding for affordable housing, increased social services, harm reduction, decriminalization, de-incarceration, and healthy built environments.
- Align with the American Medical Association and pass stricter gun legislation.
- Address the intersection of discrimination and stigma through increased mental health care and substance use disorder treatment.
- Address the compounding risk for people with perinatal mental health conditions (including substance use disorders) and stigma.
- Prioritize community-led solutions.
- Promote health by addressing social determinants of health.
- Provide access to full scope reproductive care to all Minnesotans, utilizing sexual and reproductive health and wellbeing and sexual and reproductive health equity frameworks.
- Decriminalize sex work and ensure safe working conditions for sex workers.
- Increase diversity in the health care workforce and provide support (like employee resource groups) for health care providers and workers.

- Provide high quality, on-going education for the health care workforce on relevant topics including trauma-informed care, evidence-based implicit bias mitigation, harm reduction, and cultural humility.
- Provide universal health care to all pregnant and postpartum Minnesotans.

A call to action

Reducing pregnancy-associated deaths and improving health outcomes for families are vital components to advancing the overall health of Minnesota. Action must be taken by people in the systems and organizations that provide care and support to women, pregnant people, and their families. There is an urgent need to invest in the perinatal workforce and expand perinatal mental health and substance use disorder funding to improve support for families.

MDH partners with health systems, community organizations, elected officials, and other agencies to provide expert guidance on the recommendations and content areas within this report. MDH invites partnership and collaboration to implement any of the recommendations within this report.

To change health outcomes, the committee encourages Minnesotans at every level to review and implement the recommendations. Ensuring all people can be healthy in thriving communities and receive high quality health care makes our state strong. From health systems to policy makers and providers to community organizations, everyone is invited to take part in the important work of improving maternal health in the state.

Acknowledgements

The committee would like to acknowledge the countless number of community stakeholders, partners, and advocates who continue to champion this work throughout the state. A special thanks to those pursuing change in maternal health. The committee is grateful to the partners who have championed this work. Their leadership and guidance built the foundation of maternal mortality reviews in Minnesota. Thank you to our partners in the Office of Vital Records, medical examiner offices, health systems records management, and law enforcement for supporting MDH's work throughout the years. Additionally, the committee would like to acknowledge staff from the Centers for Disease Control and Prevention's Office of Reproductive Health who have provided support, technical assistance, guidance, and leadership in maternal health improvement.

The committee would also like to thank our dedicated volunteers who currently serve on the Maternal Mortality Review Committee and those who have served in the past for their integral work to identify opportunities to improve maternal health in Minnesota.

Thank you to the partners, allies, and volunteers who give their time, dedication, and devotion to move this work forward year after year.

Maternal Mortality Review Committee membership

2019-2024

Committee members reviewed 2017-2021 pregnancy-associated deaths during the years of 2019-2024. The below list includes voting members and ex-officio members serving on behalf of the Minnesota Commissioner of Health.

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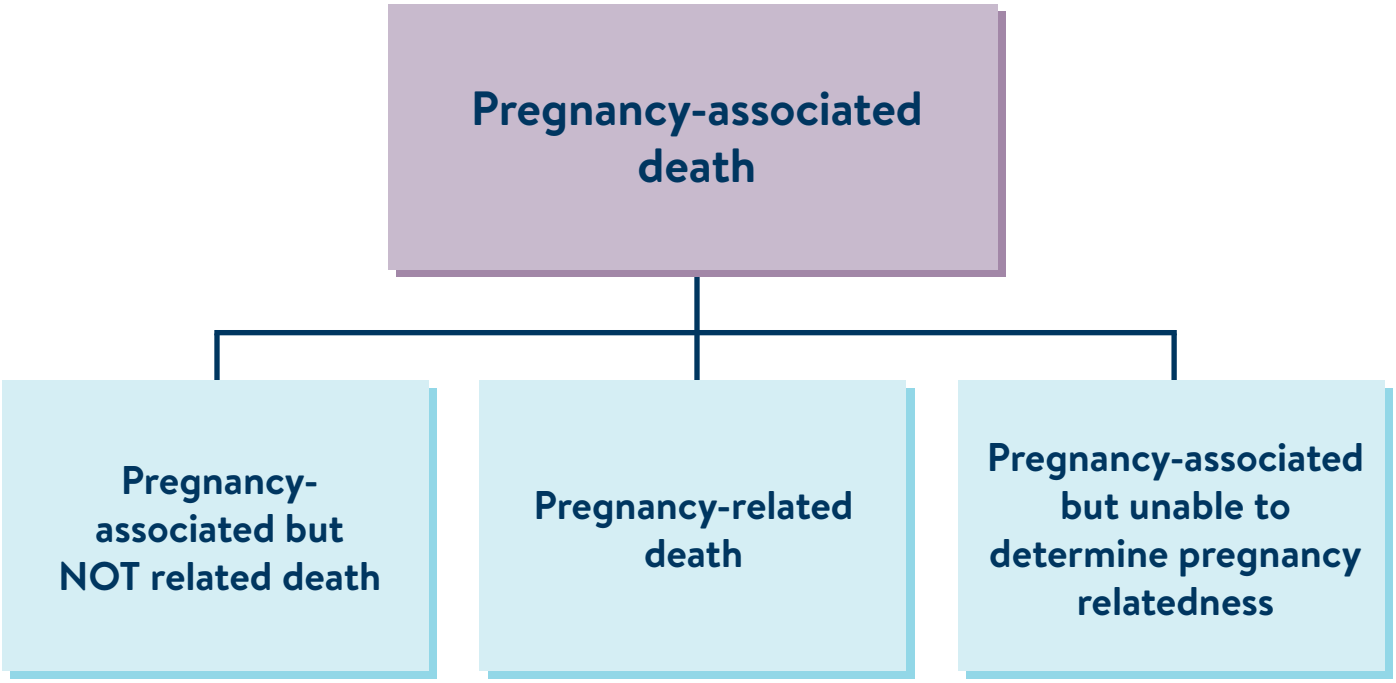
# = Abstractor

Dictionary

There are multiple definitions of what is classified as a pregnancy-associated death. Minnesota uses the definitions from the American College of Obstetricians and Gynecologists and the CDC.



Pregnancy-associated death: A death during or within one year of the end of pregnancy, irrespective of cause.

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

Pregnancy-associated but unable to determine pregnancy relatedness: A death during pregnancy or within one year of the end of pregnancy from a cause that could not be determined as pregnancy-related or not pregnancy-related.

Preventability: A death is considered preventable if the committee 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.

Standardized descriptions

The following are standardized descriptions of contributing factors provided by the CDC. Using standardized language to categorize factors contributing to a pregnancy-associated death allows for clear understanding of the factor and allows national comparisons of factors impacting pregnancy-associated deaths.

- **Access/financial:** Systemic barriers, e.g., lack or loss of health care insurance or other financial duress, as opposed to noncompliance, impacted their ability to care for themself (e.g., did not seek services because unable to miss work or afford postpartum visits after insurance expired). Other barriers to accessing care: insurance non-eligibility, provider shortage in their geographical area, and lack of public transportation.
- **Adherence:** The provider or patient did not follow protocol or failed to comply with standard procedures (i.e., non-adherence to prescribed medications).
- **Assessment:** Factors placing the individual at risk for a poor clinical outcome recognized, and they were not transferred/transported to a provider who could give a higher level of care.
- **Chronic disease:** Occurrence of one or more significant pre-existing medical conditions (e.g., obesity, cardiovascular disease, or diabetes).
- **Clinical skill/quality of care:** Personnel were not appropriately skilled for the situation or did not exercise clinical judgement consistent with standards of care (e.g. error in the preparation or administration of medication or unavailability of translation services).
- **Communication/lack of case coordination or management/Lack of continuity (system perspective):** Care was fragmented (i.e., uncoordinated or not comprehensive) among or between health care facilities or units, (e.g. records not available between inpatient and outpatient or among units within the hospital, such as emergency department and labor and delivery).
- **Continuity of care (Provider or facility perspective):** Care providers did not have access to individual's complete records or did not communicate their status sufficiently. Lack of continuity can be between prenatal, labor and delivery, and postpartum providers.
- **Cultural/religious or language factors:** The provider or patient demonstrated that any of these factors was either a barrier to care due to lack of understanding or led to refusal of therapy due to beliefs (or belief systems).
- **Delay:** The provider or patient was delayed in referring or accessing care, treatment, or follow-up care/action.
- **Discrimination:** Treating someone less or more favorably based on the group, class, or category they belong to resulting from biases, prejudices, and stereotyping. It can manifest as differences in care, clinical communication, and shared decision-making.
- **Environmental:** Factors related to weather or social environment.
- **Equipment/technology:** Equipment was missing, unavailable, or not functional (e.g. absence of blood tubing connector).
- **Health care team:** A group of professionals contributing to the care of birthing people. This includes all provider types and ancillary staff birthing people may encounter during their pregnancy journey. Examples include but are not limited to family medicine provider, obstetrician, maternal fetal medicine provider, nurse practitioner, physician assistant, midwife, registered nurse, social worker, doula, occupational therapist, phlebotomist, pharmacists, rooming staff, lactation consultant.

- **Interpersonal racism:** Discriminatory interactions between individuals based on differential assumptions about the abilities, motives, and intentions of others and resulting in differential actions towards others based on their race. It can be conscious as well as unconscious, and it includes acts of commission and acts of omission. It manifests as a lack of respect, suspicion, devaluation, scapegoating, and dehumanization.
- **Knowledge:** The provider or patient did not receive adequate education or lacked knowledge or understanding regarding the significance of a health event (e.g., shortness of breath as a trigger to seek immediate care) or lacked understanding about the need for treatment/follow-up after evaluation for a health event (e.g., needed to keep appointment for psychiatric referral after an emergency department visit for exacerbation of depression).
- **Law enforcement:** Law enforcement response was not in a timely manner or was not appropriate or thorough in scope.
- **Legal:** Legal considerations impacted the outcome.
- **Mental health conditions:** The patient had a documented diagnosis of a psychiatric disorder. This includes postpartum depression. If a formal diagnosis is not available, refer to your review committee subject matter experts (e.g., psychiatrist, psychologist, licensed counselor) to determine whether the criteria for a diagnosis of substance use disorder or another mental health condition are met based on the available information.
- **Outreach:** Lack of coordination between health care system and other outside agencies/ organizations in the geographic/cultural area that work with maternal health issues.
- **Policies/procedures:** The facility lacked basic policies or infrastructure germane to the individual's needs (e.g., response to high blood pressure, or lack of or outdated policy or protocol).
- **Referral:** Specialists were not consulted or did not provide care; referrals to specialists were not made.
- **Social support/isolation:** Social support from family, partner, or friends was lacking, inadequate, and/or dysfunctional.
- **Structural racism:** The systems of power based on historical injustices and contemporary social factors that systematically disadvantage people of color and advantage White people through inequities in housing, education, employment, earnings, benefits, credit, media, health care, criminal justice, etc.
- **Substance use disorder:** Substance use disorder is characterized by recurrent use of alcohol and/or drugs causing clinically and functionally significant impairment, such as health problems or disability. The committee may determine that substance use disorder contributed to the death when the disorder directly compromised their health status (e.g., acute methamphetamine intoxication exacerbated pregnancy- induced hypertension, or they were more vulnerable to infections or medical conditions).
- **Tobacco use:** The patient's use of tobacco directly compromised the patient's health status (e.g., long-term smoking led to underlying chronic lung disease).
- **Trauma:** The individual experienced trauma, i.e., loss of child (death or loss of custody), rape, molestation, or one or more of the following: Sexual exploitation during childhood plus persuasion, inducement, or coercion of a child to engage in sexually explicit conduct; or other physical or emotional abuse other than that related to sexual abuse during childhood.
- **Unstable housing:** Individual lived on the street, in a homeless shelter, or in transitional or temporary circumstances with family or friends.
- **Violence and Intimate Partner Violence (IPV):** Physical or emotional abuse perpetrated by current or former intimate partner, family member, friend, acquaintance, or stranger.
- **Other:** Contributing factor not otherwise mentioned.

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Hear Her campaign (https://www.health.state.mn.us/people/womeninfants/maternalmort/hearher.html)

Consensus criteria for pregnancy-related suicide and unintentional overdose (https://doi.org/10.1007/s00737-023-01375-4)

Appendices

The appendices included with this report were authored by the Minnesota Department of Health and were developed independent of the Maternal Mortality Review Committee.

Appendix A: Methodological Limitations and Interpretive Framework of the Maternal Mortality Review Process

Purpose and context

Maternal mortality review is a cornerstone public health methodology used nationwide to identify pregnancy-associated and pregnancy-related deaths, understand contributing factors, and inform prevention strategies (CDC, 2019; Petersen et al., 2019). The process is intentionally multidisciplinary, drawing on clinical expertise, public health practice, and lived-experience perspectives to move beyond cause-of-death classification toward actionable system-level learning (CDC, 2020).

This section describes the methodological limitations of the maternal mortality review process, contextualizes their implications, and articulates the strengths and safeguards that support scientific rigor, transparency, and equity-centered interpretation. The intent is not to diminish confidence in findings, but to ensure responsible use of results consistent with the CDC Maternal Mortality Review Committee (MMRC) guidance and best practices in epidemiology, implementation science, and health equity research (CDC, 2017; Goodman et al., 2017).

Limitations of the maternal mortality review process

Retrospective and observational design

The maternal mortality review process is inherently retrospective, relying on review of deaths that have already occurred using records created for clinical, legal, or administrative purposes rather than research (Petersen et al., 2019). As with all retrospective observational methodologies, maternal mortality review is subject to incomplete documentation, variable data quality, and lack of experimental control (Rothman, Greenland, & Lash, 2008). The absence of a comparison group limits the ability to establish definitive causality in the epidemiologic sense (Hill, 1965).

Accordingly, MMRC determinations are framed in terms of plausible causal pathways, contributing factors, and preventability, rather than absolute cause-and-effect relationships (CDC, 2019). This approach aligns with national MMRC standards and reflects the reality that maternal deaths are complex, multifactorial events shaped by clinical, social, and structural determinants (Howell, 2018).

Case identification and ascertainment challenges

Despite the use of nationally recommended best practices—including deterministic and probabilistic linkage of death, birth, and fetal death records—some pregnancy-associated deaths may not be identified (Busacker et al., 2023; CDC, 2023). Pregnancy status may be inaccurately recorded on death certificates, particularly for early pregnancy losses, deaths occurring outside health care settings, or deaths involving stigma-laden causes such as substance use or suicide (Catalano et al., 2020; Davis et al., 2017).

Conversely, reliance on ICD-10 codes or pregnancy checkboxes may produce false positives that require confirmation through additional data sources (Catalano et al., 2020). These limitations may result in under- or over-ascertainment of eligible cases and affect the completeness of the case review universe (CDC, 2023).

Dependence on existing documentation and information bias

Maternal mortality review relies heavily on existing records, including medical charts, emergency medical services reports, autopsy findings, and, when available, family interviews or media reports (CDC, 2019). Documentation practices vary substantially across providers, institutions, and systems, and may reflect implicit bias, stigma, or omission of contextual factors such as transportation barriers, housing instability, insurance disruptions, or language access challenges (Goddu et al., 2018; Chapman et al., 2020).

Critically, the absence of documentation does not equate to the absence of discrimination, inequitable treatment, or structural barriers (Institute of Medicine, 2003). As a result, information bias may systematically limit the committee's ability to fully capture social, structural, and interpersonal contributors to maternal death (Bailey et al., 2017).

Measurement of discrimination and structural inequities

Assessing whether discrimination contributed to a maternal death presents distinct methodological challenges (CDC, 2022). Discrimination is rarely explicitly documented and often manifests indirectly through patterns of communication, clinical decision-making, delays in diagnosis or treatment, and departures from established standards of care (Howell et al., 2016; Hardeman et al., 2020).

The MMRC methodology operationalizes discrimination through observable indicators and evaluates whether these indicators plausibly contributed to harm using structured criteria and expert consensus (CDC, 2022). However, interpersonal bias, structural racism, and cumulative disadvantage are often normalized within health systems and therefore under-documented (Bailey et al., 2017). Consequently, findings related to discrimination likely represent conservative estimates rather than the full magnitude of inequitable influences on maternal outcomes (Petersen et al., 2019).

Subjectivity and consensus-based judgment

Although the maternal mortality review process employs standardized abstraction tools, structured decision rubrics, multidisciplinary expertise, and formal voting procedures, determinations ultimately rely on professional judgment (CDC, 2019). Variation in interpretation is mitigated through training, guideline crosswalks, confidence ratings, and reconciliation processes, but cannot be fully eliminated (Goodman et al., 2017).

Importantly, uncertainty is explicitly acknowledged through voting options such as "probably" or "unknown," reflecting methodological humility rather than weakness (CDC, 2020). This transparency distinguishes MMRC review from approaches that imply false precision (Rothman et al., 2008).

Limited generalizability

Maternal mortality review findings are jurisdiction-specific and reflect local health system organization, population demographics, resource availability, and policy environments (CDC, 2019). While aggregated patterns often align with national trends, individual case findings are not intended for statistical generalization (Petersen et al., 2019). The primary purpose of maternal mortality review is prevention-oriented learning and system improvement, not population-level causal estimation (WHO, 2016).

Temporal lag and evolving standards of care

Because maternal mortality review involves extensive data collection, review, and consensus processes, findings often describe deaths that occurred several years prior to publication (CDC, 2019). Clinical guidelines, quality improvement initiatives, and policy contexts may have evolved during this period (ACOG, 2024). Findings must therefore be interpreted within their historical context and used to inform forward-looking system change rather than retrospective judgment (WHO, 2016).

Outcome-conditioned case inclusion and survivorship bias

The maternal mortality review process is inherently outcome-conditioned, examining only cases in which a severe adverse outcome—maternal death—has occurred. As a result, the review systematically excludes individuals who may have experienced similar exposures, including discrimination, bias, delayed care, or structural barriers, but who did not die. This design introduces a form of selection and survivorship bias, as the committee cannot directly observe or compare the experiences of individuals who encountered inequitable care yet survived pregnancy and the postpartum period. Consequently, findings reflect factors associated with fatal outcomes rather than the full spectrum or prevalence of discrimination or adverse experiences in maternity care. This limitation underscores that MMRC findings should not be interpreted as estimates of incidence or risk, but rather as sentinel indicators of system failure among the most severe outcomes (CDC, 2019; Greenland, 1977; Hernán et al., 2004)

Strengths of the maternal mortality review process despite limitations

Despite these limitations, the maternal mortality review process possesses several methodological strengths that justify its role as the foundation of maternal mortality surveillance and prevention in the United States (CDC, 2019).

These include multisource data integration beyond vital statistics alone; multidisciplinary expert review incorporating clinical, public health, and community perspectives; use of a standardized national framework (MMRIA) that supports consistency and comparability; explicit focus on preventability and missed opportunities for intervention; and structured attention to social, structural, and systemic contributors, including racism and discrimination (CDC, 2022; Petersen et al., 2019).

In practice, maternal mortality review functions as a sentinel event review system analogous to child fatality review and patient safety investigations (Goodman et al., 2017). Its purpose is not attribution of blame, but identification of actionable lessons to prevent future deaths (WHO, 2016).

Alignment with CDC and maternal mortality review information application standards

Consistent with CDC MMRC guidance, findings from this review are framed using probabilistic and contributory language, including terms such as contributing factor, associated with, probably related to, and plausible causal pathway (CDC, 2019). The MMRC does not claim to establish definitive causation. Rather, it applies a validated public health review methodology to identify preventable conditions and system-level contributors (CDC, 2020).

This approach reflects established practice across maternal mortality review, overdose fatality review, child fatality review, and quality-of-care investigations, and meets federal standards for scientific rigor and transparency (CDC, 2017; Goodman et al., 2017).

Public and legislative interpretation guidance

For public, legislative, and community audiences, it is essential to clarify what the maternal mortality review process can and cannot conclude (CDC, 2019). These reviews carefully examine all available information to understand how and why deaths occurred and where opportunities existed to intervene. Because the process looks backward after a death has occurred, it cannot prove cause and effect with absolute certainty (Hill, 1965).

When the committee determines that a factor "probably contributed" to a death, that conclusion reflects careful, evidence-based expert judgment—not speculation (CDC, 2020). These findings are used to guide prevention strategies, improve health systems, and inform policy decisions, not to assign individual blame (WHO, 2016).

Equity-centered implementation implications

Recognizing the limitations of maternal mortality review has important implications for policy and practice (Bailey et al., 2017). Absence of documented evidence should not be interpreted as evidence of absence, particularly for discrimination and structural barriers (Hardeman et al., 2020). Investments in improved documentation, data linkage, and inclusion of community-informed data sources are critical (CDC, 2022).

Maternal mortality review findings should be integrated with qualitative research, lived-experience expertise, and implementation science to translate insight into action (Proctor et al., 2011). Importantly, public health action should not be delayed in pursuit of perfect data. Maternal mortality is a low-frequency but high-impact outcome, and precautionary, equity-centered responses are both scientifically and ethically warranted (WHO, 2016).

Conclusion

The maternal mortality review process is a rigorous, transparent, and prevention-oriented methodology designed to address one of the most complex challenges in public health (CDC, 2019). Its limitations are inherent to retrospective case review and are openly acknowledged. When interpreted within this framework, maternal mortality findings provide robust, ethically grounded evidence to inform systems change, advance equity, and prevent future maternal deaths (Petersen et al., 2019).

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Appendix B: Methodology and Processes Used to Determine Discrimination

Purpose and approach

This appendix provides a detailed, replicable methodology for identifying discrimination in maternal mortality cases reviewed by MDH's Maternal Mortality Review Committee (MMRC). It is designed so that a trained, independent reviewer could apply the same criteria and reach the same conclusions, reinforcing rigor, transparency, and public trust.

Discrimination, as defined here, refers to differential treatment or systemic processes that contribute to preventable maternal harm or death based on race, ethnicity, socioeconomic status, language, ability, or other protected characteristics. The review process assesses observable evidence that systems and providers departed from accepted standards of care and whether biased decision-making, inequitable practice patterns, or structural barriers could have contributed to the fatal outcome.

This method draws from the CDC's MMRC guidance, national clinical standards (e.g., ACOG), and published frameworks for detecting bias in clinical documentation and maternal health inequities **(Table 1)**.

Overview of review framework

The determination of discrimination uses a threelayer framework:

- Evidence of biased perception or documentation
  - Presence of stigmatizing, judgmental, or dehumanizing language.
  - Language that implies blame without acknowledging structural or clinical context.
- Evidence of differential or substandard clinical care
  - Departure from nationally accepted standards of care.
  - Delays, undertreatment, inappropriate or insufficient diagnostics/interventions.
  - Failure to modify care in response to reported symptoms.
- Evidence of causal pathways connection
  - Committee evaluates whether biased attitudes or inequitable practices plausibly contributed to delayed recognition, inadequate treatment, or missed opportunities for intervention.
  - Assessment considers alternative explanations and confidence level.

A case meets criteria for discrimination when all three conditions are supported by evidence (Step 3 below may conclude as "probable" when direct documentation is limited but clear patterns exist).

Step-by-step review process

Step 1. Case abstraction and evidence compilation

The abstractor:

- Extracts objective clinical timeline and care pathway.
- Flagged indicators:
  - Biased/stigmatizing language. Biased language includes terms or descriptors such as frequent flyer, non-compliant, left against medical advice, addicted baby, addict, clean, junkie, difficult, unpleasant, uncooperative, agitated, and aggressive.
  - Missed or delayed clinical care.
  - Social and structural barriers noted but not addressed.
- Documents direct quotes and supporting context.
- Evaluates care against national standards and clinical guidelines.

Training: Abstractors receive CDC training and supplemental modules on detecting bias, systemic racism, and documentation bias.

Step 2: Structured committee review

Prior to meetings, committee members receive case summaries and flagged indicators using a standardized rubric and decision form.

Committee members are trained in:

- Implicit bias
- Structural racism in health systems
- Evidence appraisal
- CDC MMRC discrimination definitions

Step 3. Case presentation and determination

During meetings:

- Abstractor presents case timeline, flagged indicators, and guideline comparison.
- Committee discusses:
  - Was biased language present?
  - Was care inequitable or below standard? A below-standard level of care may be identified either by the abstractor or by the review committee. When the abstractor identifies it, they refer to professional standards of care, such as published guidelines or consensus statements (Table 1). A common example in MMRC cases is when a patient reports—or a provider observes—mental health symptoms that are not addressed. When the committee identifies undertreatment, their determination is based on the clinical expertise of its members (as a reminder, several committee members are practicing clinicians, including maternal fetal medicine specialists, OB-GYNs, family medicine physicians, certified nurse-midwives, and registered nurses).
  - Is there a plausible causal pathway between bias/inequity and the fatal outcome? Voting options: Yes, Probably, No, Unknown. For national reporting, “Yes” and “Probably” are combined.

It is important to note that this process is not designed to establish a definitive causal relationship between mortality and contributing factors with a high degree of certainty. Rather, it seeks to identify and characterize contributing factors based on comprehensive review of available documentation and informed expert judgment.

As an example, the following summarizes data from a case where discrimination was deemed a contributing factor.

A **highly plausible case** might involve a person with mental health conditions who becomes pregnant and establishes prenatal care. Screening for mental health concerns is inconsistently conducted, omitted, or performed ineffectively. The provider observes mental health symptoms and documents them in the medical record but does not take action. The patient subsequently misses several appointments due to lack of transportation, and the provider records that the patient is "non-compliant." Following delivery—when needs are often greatest—very little follow-up care is provided, and the person dies by suicide. In the documentation, the abstractor notes stigmatizing language, such as the provider stating that the patient is "unwilling" to "admit to" drug use. The committee recognizes that when negative provider assumptions and biases intersect with systemic barriers—such as limited transportation or access to care—the consequences can be fatal.

Conversely, a low-plausibility case might involve a patient who receives high-quality, evidence-based care without major barriers to access. She attends appointments regularly, has adequate food security, and maintains health insurance coverage. As an example, a white woman giving birth in a suburban hospital experiences an amniotic fluid embolism—a rare and unpredictable obstetric emergency. The condition is promptly recognized, and she is transferred to a higher level of care. Despite appropriate management, she dies postpartum from complications of the embolism.

In such instances, a definitive "No" determination by the committee indicates that the individual received consistent, high-quality, evidence-based care. This conclusion is supported through detailed review of documentation, alignment with established standards of care, and the collective clinical expertise of committee members.

Figure 1: Discrimination overall, Minnesota 2017-2021

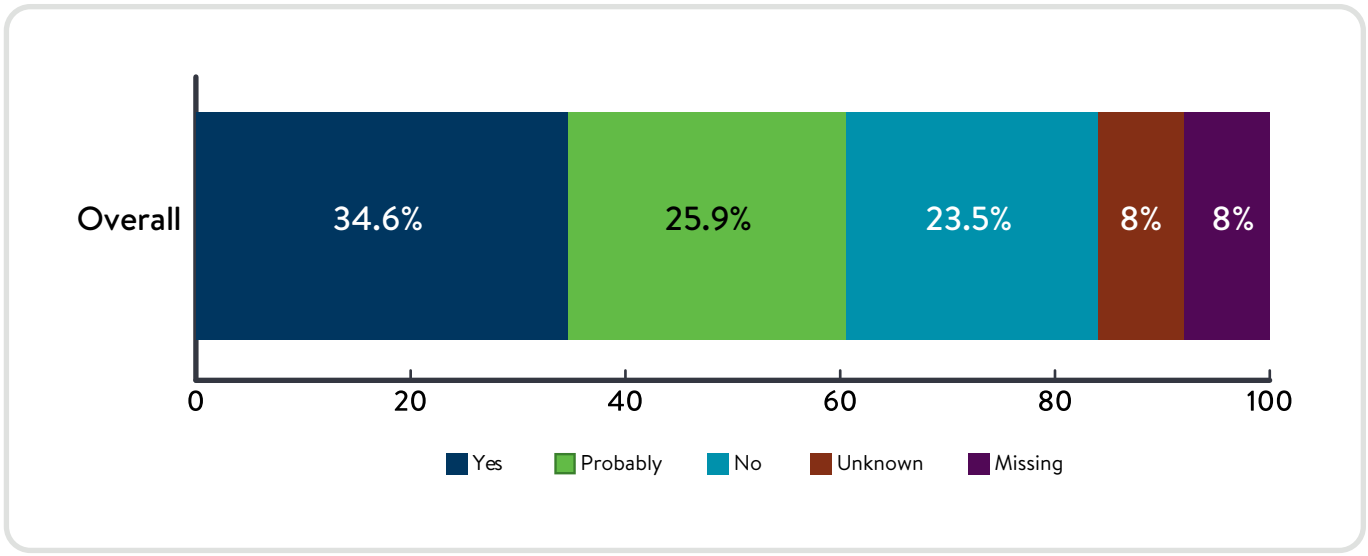
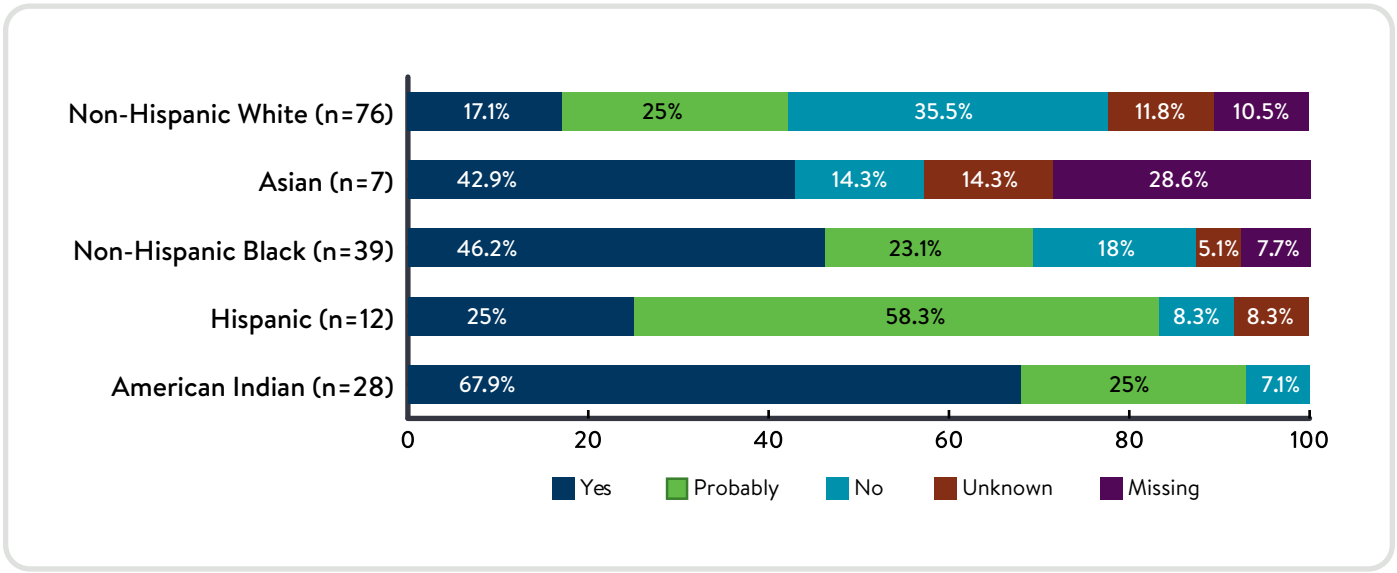


Figure 2: Discrimination | race/ethnicity, Minnesota 2017-2021



Confidence and reproducibility

To support scientific rigor:

- Each determination includes a confidence rating:
  - High confidence: clear evidence across multiple sources.
  - Moderate confidence: consistent patterns, some documentation limitations.
  - Low confidence: suggestive but limited documentation.
    Note: It is important to emphasize that the final determination (yes, probably, no, unknown) is made through a formal voting process in which each committee member bases their decision on evidence drawn from multiple sources—including documentation, expert assessments, and interview information—rather than on a reported confidence rating. The committee's final determination reflects their collective level of confidence in the evidence available and its sufficiency to support a conclusion **(Figures 1 and 2)**. Reviewers must cite evidence for each judgment.
- Disagreements trigger second review and reconciliation.

Operational definitions

- **Biased language:** language implying moral judgment, blame, or disrespect. Nonpersonfirst language; assumptions about behavior or intent.
- **Care inequity:** documented delays, undertreatment, or deviations from guidelines not explained by clinical presentation.
- **Causal link:** reasonable conclusion that inequitable care contributed to clinical deterioration or missed opportunity for intervention.

Example indicators:

- Biased language
  - "Noncompliant" without reference to access barriers.
  - "Drugseeking," "difficult patient," or similar descriptors.
  - Implicit blame without contextual detail.
- Inequitable clinical care
  - Failure to escalate care after repeated pain/distress reports.
  - Delayed diagnostics for hypertensive symptoms.
  - Premature dismissal of patient concerns.
- Evidence of causal pathways
  - Delayed recognition of obstetric emergency due to minimization of symptoms.
  - Failure to act on abnormal vitals.

Documentation indicating disbelief of patient reports.

Table 1: Guidelines crosswalk

Framework	Purpose	What reviewer extracts in case review	How it supports the causal link to maternal death
CDC MMRC / MMRIA Discrimination Field guide (https://www.cdc.gov/maternal-mortality/php/mmrc/guides-tools.html)	Standardized United States MMRC method for identifying racism/discrimination as a contributor	Evidence in chart review, committee vote, "Yes/Probably/No/Unknown" classification, contributing factor codes	Defines discrimination as a causal factor; provides national reporting consistency and language for causal judgements
Stigmatizing Language in Clinical Documentation, JAMA/NEJM/AMA frameworks (https://pmc.ncbi.nlm.nih.gov/articles/PMC11213326/)	Identify biased, judgmental, dehumanizing language in records	Terms implying blame ("noncompliant," "drug-seeking"), skepticism of symptoms, tone implying moral judgment	Biased documentation > provider perception > care minimization/delays > adverse outcome path
AMA-AAMC Equity-Centered Language Guide (https://www.aamchealthjustice.org/key-topics/trustworthiness/narrative-guide)	Standard for person-first, respectful documentation	Person-first language, structural context, absence of blame	Defines what respectful, non-biased documentation should look like; deviations signal bias and risk of inequitable care
World Health Organization Quality of Care for Maternal and Newborn Health (https://www.who.int/publications/m/item/quality-of-care-for-maternal-and-newborn--a-monitoring-framework-for-network-countries)	Establishes global standard for maternal care quality and experience	Delays in treatment, dismissive communication, lack of escalation, disrespect	Shows where care diverged from expected standards and aligns communication failure with quality deficits
Respectful Maternity Care Charter (https://content.sph.harvard.edu/wwwhsph/sites/2413/2014/05/Final_RMC_Charter.pdf)	Rights-based framework covering dignity, respect, communication, consent	Evidence of disrespect, coercion, dismissal, punitive tone, failure to listen	Converts disrespect into a measurable safety risk and human-rights breach linked to poor outcomes
Person-Centered Maternity Care (PCMC) Scale (https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288051)	Validated measurement of dignity, respect, autonomy in maternity care	Evidence of ignored symptoms, inadequate communication, lack of shared decision making	Connects patient experience to clinical quality—poor person-centered care predicts worse outcomes

Framework	Purpose	What reviewer extracts in case review	How it supports the causal link to maternal death
Joint Commission Perinatal Safety and Equity Guidance (https://www.jointcommission.org/en-us/knowledge-library/support-center/measurement/perinatal-care?utm_source=chatgpt.com)	Prevent harm and inequity in hospital obstetric care	Unaddressed safety risks, documentation of missed escalation steps, failures to follow protocols	Aligns biased care patterns with recognized patient-safety violations
ACOG Committee Opinions on Racial and Ethnic Inequities (https://www.acog.org/clinical/clinical-guidance/committee-statement/articles/2024/09/racial-and-ethnic-inequities-in-obstetrics-and-gynecology?utm_source=chatgpt.com)	Clinical consensus on racism as a determinant of maternal outcomes	Departure from guidelines for hypertensive disorders, hemorrhage, postpartum follow-up	Links inequity to deviations from evidence-based care standards