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DEPT. OF HEALTH AND HUMAN SERVICES

Jim Pillen, Governor

December 31, 2025

The Honorable Jim Pillen
Governor of Nebraska
P.O. Box 94848
Lincoln, NE 68509

Mr. Brandon Metzler
Clerk of the Legislature
P.O. Box 94604
Lincoln, NE 68509

Subject: State Maternal Death Review Team Annual Report

Dear Governor Pillen and Mr. Metzler:

In accordance with Neb. Rev. Stat. § 71-3407, the Division of Public Health submits this report for the Nebraska Maternal Mortality Review Committee.

This Maternal Mortality Review Committee report presents an overview of pregnancy-associated and pregnancy-related deaths in the State of Nebraska occurring from 2014 to 2023 as well as recommendations from the Maternal Mortality Review Committee.

Sincerely,

Ashley Newmyer

Ashley Newmyer
Interim Director, Division of Public Health

Attachment

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Division of Public Health

State Maternal Death Review Team Annual Report

December 2025

Neb. Rev. Stat. § 71-3407

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Background

In Nebraska, the Maternal Mortality Review Committee (MMRC) was established under the Child and Maternal Death Review Act, Neb. Rev. Stat. §§ 71-3404 to 71-3411, which establishes the legal framework for reviewing deaths that occur during pregnancy or within one year after the pregnancy ends. In 2013, maternal death reviews were formally added to the statutory scope of the Child Death Review Team (CDRT).

In 2018, the MMRC was organized as a subcommittee under the Child and Maternal Death Review Team (CMDRT) and began reviewing maternal deaths that occurred in 2017. In 2022, the Legislature further defined in statute the CDRT and MMRC's distinct roles, while maintaining joint oversight by the Office of Maternal and Child Health Epidemiology at the Nebraska Department of Health and Human Services (DHHS).

The MMRC's primary goal is to identify causes of maternal mortality, assess preventability, and make recommendations to reduce these deaths while addressing the disparities that affect pregnant and postpartum women across the state. Reviews follow guidance from the Centers for Disease Control and Prevention (CDC) using the Maternal Mortality Review Information Application (MMRIA, pronounced "Maria"), a tool used for standardizing case abstraction and analysis. The MMRC also receives technical assistance and funding through the CDC's Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) cooperative agreement.

This report presents data on deaths occurring from 2014 to 2023 and summarizes key findings, trends, and recommendations developed by the MMRC.

Process

Maternal deaths in Nebraska are identified by utilizing the following methods:

- Pregnancy Checkbox: If the death certificate indicates that someone was pregnant or had a pregnancy within one year of death, this identifies a potential case.
- Data Linkages: Maternal data recorded on infant birth and fetal death certificates is linked to maternal death records. A match, in which a maternal death occurs within one year of the birth or fetal death, is classified as a potential case.
- Pregnancy-Related Causes of Death: If the death certificate lists a cause of death with an International Classification of Diseases (ICD)-10 code that falls under section O (causes related to pregnancy, childbirth, or complications during the postpartum period), this identifies a potential case.

DHHS performs an initial review of medical records to confirm that the decedent was either pregnant at the time of death or had a pregnancy within one year of death. Once confirmed, the case is then considered for committee review and is assigned a de-identified case number.

Next, DHHS requests complete records for each case from hospitals, clinics, and provider offices where the decedent received care. Additional records are requested from law enforcement agencies, coroners, DHHS divisions, emergency medical services, and any other agencies as appropriate. Relevant case information is entered into CDC's MMRIA database by DHHS. DHHS then writes a detailed, de-identified case narrative that summarizes the events surrounding the death. This case narrative is distributed to MMRC members prior to each meeting.

The committee meets quarterly to review cases. The goal during case reviews is to answer the following six core questions and complete the MMRC Committee Decisions Form:

- Was the death pregnancy-related?
- What was the cause of death?
- Was the death preventable?
- What are the critical factors that contributed to the death?
- What recommendations and actions address those contributing factors?
- What is the anticipated impact of those actions if implemented?

The MMRC performs a full case review for every death that occurred during pregnancy or within one year of the end of a pregnancy, regardless of the cause of death or if the death is pregnancy-associated or pregnancy-related. During review of each case, the committee discusses the events and circumstances that contributed to the death and determines if reasonable changes to the patient, family, community, provider, facility, and/or system could have altered the outcome. If no reasonable changes are identified, the death is determined to be not preventable. However, if the death is determined to be preventable, each event or circumstance that contributed to the death is summarized as a contributing issue and assigned a contributing factor class (see *Appendix A: Maternal Mortality Review Committee Decisions Form v24.3* for the standardized list of contributing factor classes).

The committee then puts forth actionable recommendations that can prevent the issue from contributing to future deaths. An actionable recommendation outlines the responsible party (person, agency, or organization), the action to be taken (intervention), and the appropriate timing or interval of the action.

Both the contributing issue and recommendation are categorized into one of five levels:

- Patient/Family: An individual before, during, or after a pregnancy, and their family, internal or external to the household, with influence on the individual.
- Community: A group based on a shared sense of place or identity. This can include physical neighborhoods or communities based on common interests and shared circumstances.
- Provider: An individual with training and expertise who provides care, treatment, and/or advice.
- Facility: A physical location where direct care is provided. This can include small clinics, urgent care centers, hospitals, or specialty care centers.
- System: Interacting entities that support services before, during, or after a pregnancy. This includes healthcare systems, payors, public services, and programs.

The level of the contributing issue identifies where in the continuum of care the issue occurred while the level of the recommendation determines where the opportunities for prevention exist to prevent similar deaths.

Methods

Data, reviewed by the MMRC, was extracted from the Nebraska Maternal Mortality Review Information Application (NE MMRIA) as of July 2025. The NE MMRIA dataset included all deaths that occurred among Nebraska residents during or within one year of the end of pregnancy from 2014 through 2023. In addition, population level information from the DHHS Office of Vital Records was used to supplement the NE MMRIA to describe maternal demographic and birth characteristics.

All analyses followed CDC's MMRIA Data Dictionary definitions and coding conventions.

Data cleaning, recoding, and analyses were performed using SAS Version 9.4. Descriptive analyses were performed to summarize frequencies and percentages. Statistical comparisons (including Fisher's exact and chi-squared tests where appropriate) were used to examine differences across groups. A Poisson regression model with a Type III (Wald) chi-squared test was used to assess temporal trends in maternal mortality. Tables and figures were created using Microsoft Excel (Office 365).

To protect confidentiality, any cell counts between one and five were suppressed in accordance with state data privacy standards.

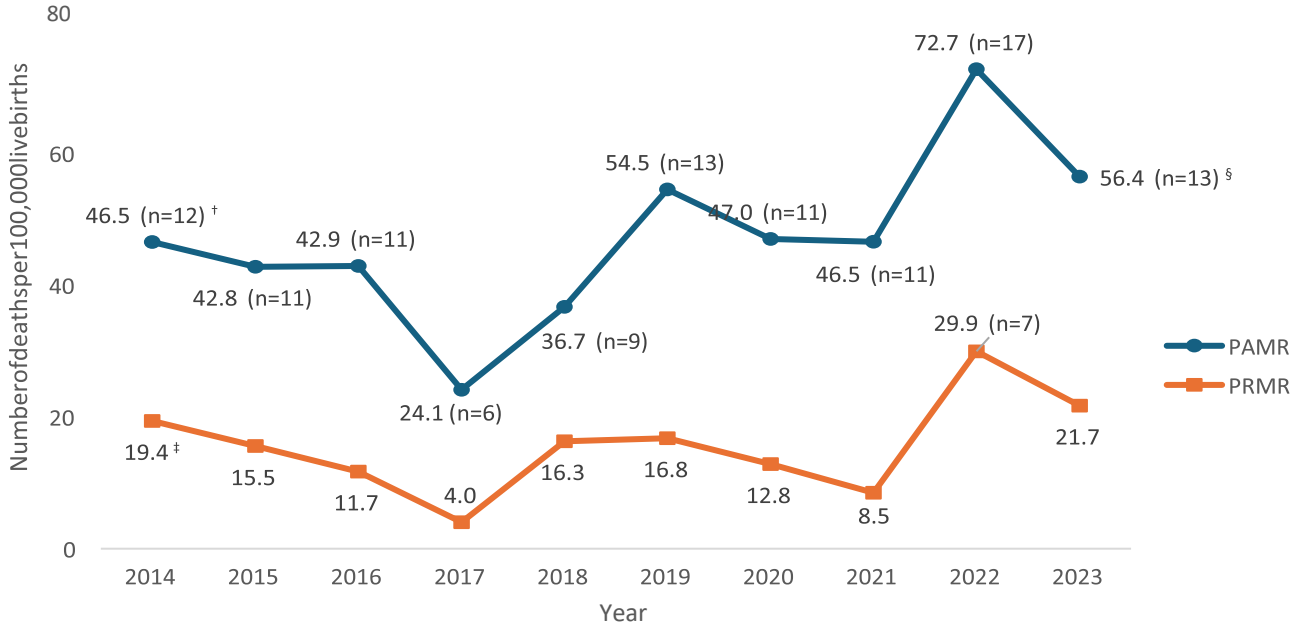
Findings

Overview of Pregnancy-Associated and Pregnancy-Related Deaths

The number of pregnancy-associated and pregnancy-related deaths in Nebraska from 2014 to 2023, along with their corresponding mortality ratios, are shown in Figure 1. Pregnancy-associated deaths include all deaths that occur during pregnancy or within one year of the end of pregnancy, regardless of cause. Pregnancy-related deaths, in contrast, are those directly caused by a pregnancy complication, a chain of events initiated by pregnancy, or the physiological effects of pregnancy exacerbating an unrelated condition (Callahan et al., 2021).

From 2014 to 2023, Nebraska's pregnancy-associated mortality ratio (PAMR) ranged from 24.1 to 72.7 deaths per 100,000 live births, while the pregnancy-related mortality ratio (PRMR) ranged from 4.0 to 29.9 deaths per 100,000 live births (Figure 1). Although some annual fluctuations are observed, these year-to-year differences are not statistically significant, and no statistically significant long-term trend was identified (Poisson regression, p=0.57).

Figure 1. Pregnancy-Associated Mortality Ratio* (n=114) and Pregnancy-Related Mortality Ratio (n=38), Nebraska 2014-2023.



Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.

*Pregnancy-associated mortality ratio (PAMR) is defined as the number of pregnancy-associated deaths per 100,000 live births. Pregnancy-related mortality ratio (PRMR) represents the number of pregnancy-related deaths per 100,000 live births. Both ratios use the total number of live births as the denominator, based on Nebraska residents, occurrent birth certificate records.
† Ratios based on fewer than 20 deaths should be interpreted with caution.
‡ Values based on counts of 1–5 are suppressed to maintain confidentiality.
§ The 2023 pregnancy-associated death count includes one unreviewed open case. This case is not included in pregnancy-related deaths.

Demographic Characteristics

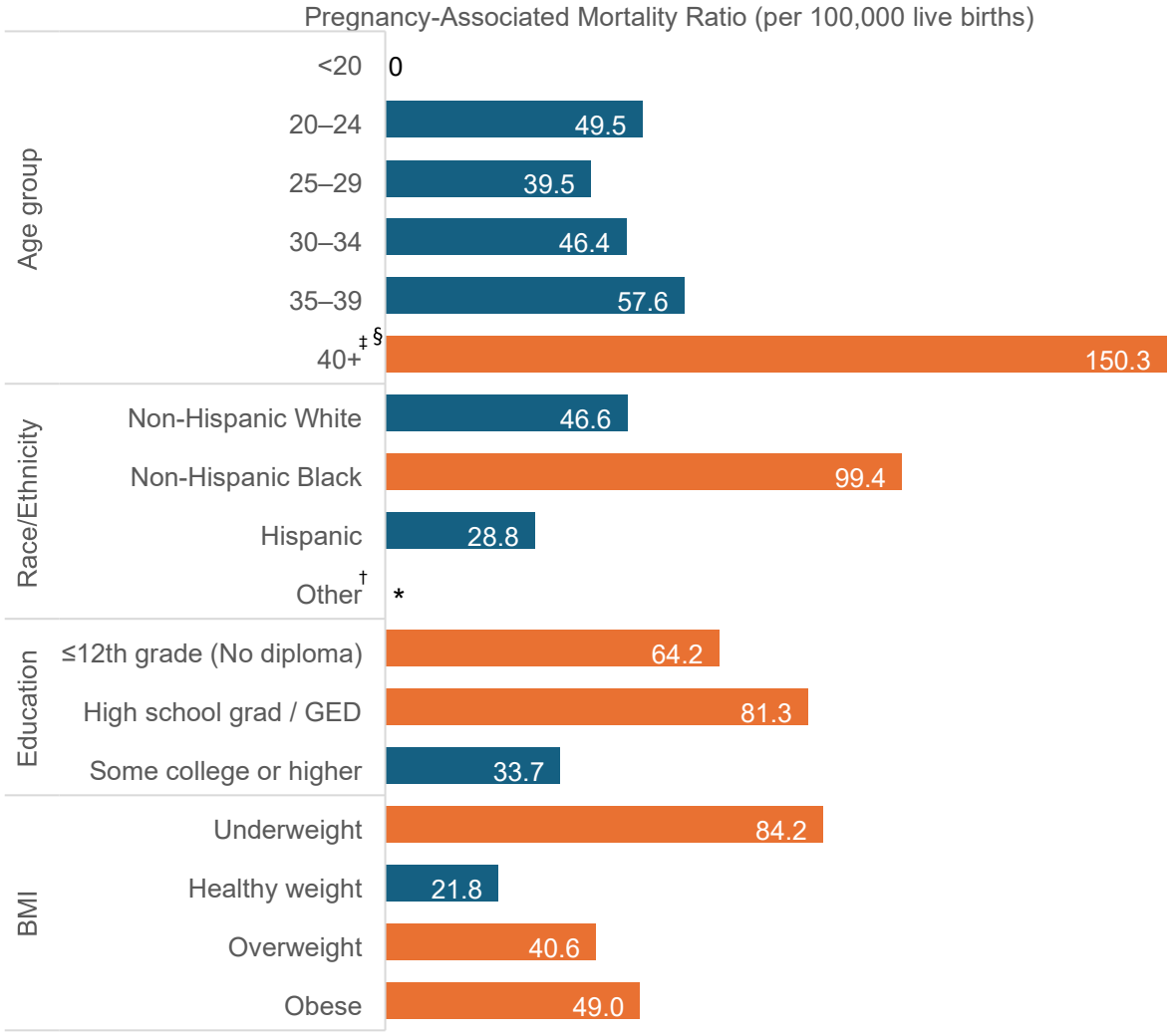
Figure 2 and Figure 3 present PAMR and PRMR by maternal age, race and ethnicity, education, and pre-pregnancy body mass index (BMI) in Nebraska, 2014 to 2023. Women aged 40 years and older had the highest pregnancy-associated mortality ratio (PAMR = 150.3 per 100,000 live births), nearly four times higher than women aged 25–29 years (39.5; p = 0.002). For pregnancy-related deaths, rates for women aged 40 years and older are suppressed due to small numbers, but the observed mortality was higher than that of women aged 25–29 years, although this difference was not statistically significant (p = 0.06). Mortality ratios for women aged 30–34 and 35–39 were higher than for those aged 25–29 but not statistically significant (p > 0.05). No pregnancy-associated deaths occurred among women younger than 20 years during this period.

By race and ethnicity, non-Hispanic Black women experienced significantly higher maternal mortality than non-Hispanic White women. The PAMR among non-Hispanic Black women (99.4 per 100,000 live births) was more than twice that of non-Hispanic White women (46.6; p = 0.009). For pregnancy-related deaths, the PRMR among non-Hispanic Black women (44.2 per 100,000) was more than three times that of non-Hispanic White women (14.0; p = 0.009). Differences between non-Hispanic White and Hispanic women were not statistically significant for either PAMR (p = 0.15) or PRMR (p = 0.64). Rates for women in the Other-race category are suppressed due to small numbers, and comparisons were not statistically significant.

By educational attainment, women with lower education experienced higher maternal mortality compared to those with some college or higher education. The PAMR among women with a high school diploma or GED (81.3 per 100,000 live births) was more than twice that of women with some college or higher education (33.7; p < 0.001). Similarly, the PRMR among women with a high school diploma or GED (32.1 per 100,000) was nearly four times that of those with some college or higher (8.9; p = 0.0006). Women with 12th grade or less, no diploma, also had significantly higher mortality than those with some college or higher (PAMR = 64.2 vs. 33.7; p = 0.02; PRMR = 28.5 vs. 8.9; p = 0.01).

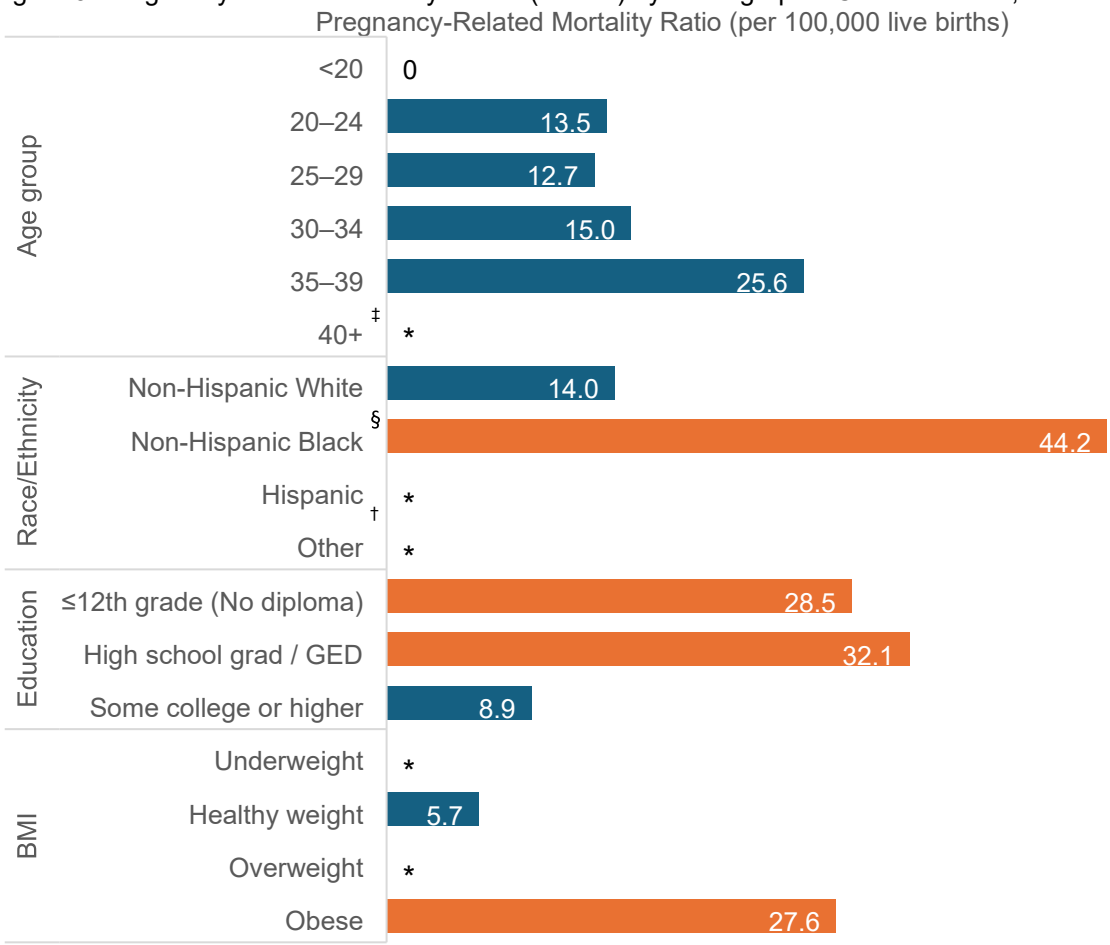
Pre-pregnancy BMI was associated with mortality. Obese women experienced more than twice the rate of pregnancy-associated death compared to those with a healthy weight (PAMR=49.0 vs. 21.8; p=0.003) and nearly five times the rate for pregnancy-related mortality (PRMR=27.6 vs. 5.7; p < 0.001). Women classified as overweight had a significantly higher PAMR than healthy-weight women (40.6 vs. 21.8 per 100,000; p=0.038), though differences in PRMR were not statistically significant (p=0.76). Underweight women also had a significantly higher PAMR compared to those with a healthy weight (84.2 vs. 21.8; p = 0.009), but the difference in PRMR was not statistically significant (p = 0.09).

Figure 2. Pregnancy-Associated Mortality Ratios (PAMR) by Demographic Characteristics, Nebraska 2014–2023.



Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.
*Cells with counts of 1–5 are suppressed; corresponding data are not shown in the figure.
† "Other race" includes Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and other. Individual categories are not reported due to small numbers.
‡ Statistical significance (orange bars) indicates $p < 0.05$ based on Fisher's exact test comparing each group to the reference category. Statistical significance means the difference is unlikely due to chance.
§ Reference categories: 25-29 years (age), Non-Hispanic White (race/ethnicity), College or higher (education), and Healthy weight (BMI).

Figure 3. Pregnancy-Related Mortality Ratios (PRMR) by Demographic Characteristics, Nebraska 2014– 2023.



Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.
*Cells with counts of 1–5 are suppressed; corresponding data are not shown in the figure.
† "Other race" includes Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and other. Individual categories are not reported due to small numbers.
‡ Statistical significance (orange bars) indicates $p < 0.05$ based on Fisher's exact test comparing each group to the reference category. Statistical significance means the difference is unlikely due to chance.
§ Reference categories: 25-29 years (age), Non-Hispanic White (race/ethnicity), Some college or higher (education), and Healthy weight (BMI).

Table 1 provides a breakdown of maternal mortality within metropolitan areas, showing separate estimates for Douglas County and Lancaster County, in addition to metropolitan, micropolitan, and rural counties as defined by 2020 U.S. Census population-based classifications. Counties were classified by total 2020 Census population and Office of Management and Budget (OMB) classification of metropolitan: metropolitan (≥50,000 population), micropolitan (10,000–49,999 population), and rural (<10,000 population) (HRSA, 2025).

Mortality ratios ranged from a PAMR of 45.0 in all metropolitan counties combined to 54.8 in Lancaster County, while PRMR values ranged from 11.5 to 23.5 per 100,000 live births. However, these differences were not statistically significant, meaning there were no significant differences in PAMR or PRMR by geographic location.

Table 1. Pregnancy-Associated and Pregnancy-Related Deaths by Geographic Unit, Nebraska 2014–2023. (Pregnancy-Associated Deaths n=114; Pregnancy-Related Deaths n=38; Total Live Births n=243,970)

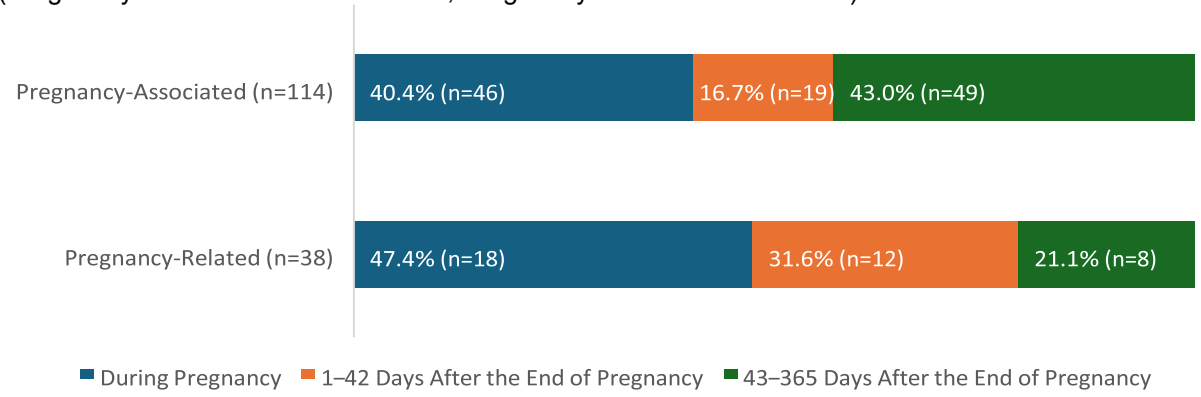
Geographic Unit	Pregnancy-Associated Deaths n (%)	PAMR	95% CI	Pregnancy-Related Deaths n (%)	PRMR	95% CI	Total Live Births
All Metropolitan Counties* (Includes Douglas, Lancaster, Sarpy, Hall, and Buffalo)	72 (63.2%)	45.0	35.2-56.7	26 (68.4%)	16.3	10.12-23.09	159,861
Douglas County	37 (32.5%)	45.6	32.1-62.8	13 (34.2%)	16.0	8.52-27.38	81,206
Lancaster County	21 (18.4%)	54.8	33.9-83.8	9 (23.7%)	23.5	10.74-44.58	38,320
Micropolitan Counties	26 (22.8%)	49.7	32.5-72.8	6 (15.8%)	11.5	4.21-24.96	52,327
Rural Counties	16 (14.0%)	50.3	28.8-81.8	6 (15.8%)	18.9	6.93-41.09	31,782
Total	114	46.7	38.5-56.1	38	15.6	11.02-21.38	243,970

Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.
* Metropolitan areas include Douglas, Lancaster, Sarpy, Hall, and Buffalo Counties. Douglas County (Omaha metro) and Lancaster County (Lincoln metro) are shown separately, and all metropolitan counties are also presented together for comparison.

Timing of Death

Figure 4 shows the distribution of maternal deaths by timing in relation to pregnancy. Among pregnancy-associated deaths (n=114), 40.4% occurred during pregnancy, 16.7% within 1–42 days postpartum, and 43.0% between 43–365 days postpartum. For pregnancy-related deaths (n=38), nearly half occurred during pregnancy (47.4%), followed by 31.6% within 1–42 days, and 21.1% between 43–365 days postpartum.

Figure 4. Timing of Pregnancy-Associated and Pregnancy-Related Deaths, Nebraska 2014–2023 (Pregnancy-Associated Deaths n=114; Pregnancy-Related Deaths n=38).



Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.

Timing of Death by Race/Ethnicity

Table 2 presents the timing of pregnancy-associated deaths by race and ethnicity. The distribution of timing of pregnancy-associated deaths differed significantly by race and ethnicity (Fisher's exact test, p = 0.006). Among pregnancy-associated deaths, a higher proportion of deaths among non-Hispanic Black women occurred during pregnancy (66.7%), compared with non-Hispanic White women and Hispanic women. Non-Hispanic White women had the largest share of deaths occurring between 43–365 days postpartum (53.8%), whereas deaths among non-Hispanic Black and Hispanic women were more likely to occur during pregnancy or within 42 days postpartum.

For pregnancy-related deaths, similar patterns were observed; however, differences by race and ethnicity were not statistically significant (p = 0.45). Data are not shown due to small numbers and to protect confidentiality.

Table 2. Timing of Pregnancy-Associated Deaths by Race/Ethnicity, Nebraska 2014–2023 (n=114).

Race/Ethnicity	During Pregnancy n (%)	1–42 Days Postpartum n (%)	43–365 Days Postpartum n (%)	Total Deaths
Non-Hispanic White	25 (31.3)	12 (15.0)	43 (53.8)	80
Non-Hispanic Black	12 (66.7)	–*	–	18
Hispanic	–	–	–	–
Other†	–	–	–	–
Total	46 (40.4)	19 (16.7)	49 (43.0)	114

Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.
*Counts and percentages based on 1–5 deaths per cell are suppressed to protect confidentiality. Where suppressed values could be derived from row or column totals, additional cells are secondarily suppressed to prevent back calculation.
† "Other race" includes Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and other. Individual categories are not reported due to small numbers.

Timing of Death by Age Group

Table 3 presents the timing of pregnancy-associated deaths by maternal age group. Among pregnancy-associated deaths, the largest share among women aged 20–24 and 30–34 occurred between 43–365 days postpartum (n=11 and 16, respectively). In contrast, nearly half of the deaths among women aged 25–29 occurred during pregnancy (n=15). Women aged 35 and older also experienced a higher proportion of deaths during pregnancy (n=12) compared to earlier postpartum periods.

For pregnancy-related deaths, most deaths among women aged 25–29 occurred during pregnancy, while deaths among younger women (aged 20–24) were distributed across pregnancy and postpartum periods, and deaths among women aged 30–34 and 35 and older were more likely to occur during or shortly after pregnancy. Detailed breakdowns for these groups are not shown to protect confidentiality.

Table 3. Timing of Pregnancy-Associated Deaths by Age Group, Nebraska 2014–2023 (n=114).

Age Group	During Pregnancy n	1–42 Days Postpartum n	43–365 Days Postpartum n	Total Deaths
<20	0	0	0	0
20–24	9	–*	11	–
25–29	15	–	12	–
30–34	10	8	16	34
35+	12	–	10	–
Total	46	19	49	114

Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.
*Counts and percentages based on 1–5 deaths per cell are suppressed to protect confidentiality. Where suppressed values could be derived from row or column totals, additional cells are secondarily suppressed to prevent back calculation.

Underlying Causes of Death

Table 4 summarizes the underlying causes of pregnancy-associated and pregnancy-related deaths in Nebraska from 2014–2023. Among pregnancy-associated deaths, the committee was able to determine an underlying cause of death in 110 cases. Injury was the most common category, accounting for one-third of pregnancy-associated deaths (34.5%), followed by mental health conditions (15.5%), cardiovascular conditions (8.2%), infection (8.2%), cancer (6.4%), and hemorrhage (5.5%). All other causes collectively accounted for 21.8% of pregnancy-associated deaths.

For pregnancy-related deaths, an underlying cause of death was determined by the committee in 37 cases. The leading underlying causes were cardiovascular conditions (16.2%) and hemorrhage (16.2%). All other causes represented 43.2% of pregnancy-related deaths.

Table 4. Underlying Causes of Pregnancy-Associated and Pregnancy-Related Deaths, Nebraska 2014–2023 (Pregnancy-Associated Deaths N=110; Pregnancy-Related Deaths n=37†)

Cause of Death Category	Pregnancy-Associated Deaths n (%)	Pregnancy-Related Deaths n (%)
Injury	38 (34.5%)	–
Mental Health Conditions	17 (15.5%)	–
Cardiovascular Conditions	9 (8.2%)	6 (16.2%)
Infection	9 (8.2%)	–
Cancer	7 (6.4%)	–
Hemorrhage (Excludes Aneurysms or Cerebrovascular Accident (CVA))	6 (5.5%)	6 (16.2%)
All Other Causes‡	24 (21.8%)	16 (43.2%)
Total	110	37

Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.
*Cells with counts of 1-5 are suppressed and combined into "All Other Causes" to maintain individual confidentiality.
† Percentages are based on 110 pregnancy-associated and 37 pregnancy-related deaths with an underlying cause determined by the committee. Three reviewed cases (including one pregnancy-related death) were classified as "Unknown cause," and one 2023 case remains under committee review and is not included.
‡ "All other causes" includes cardiomyopathy, embolism, hypertensive disorders of pregnancy, pulmonary conditions, gastrointestinal disorders, cerebrovascular accident, conditions unique to pregnancy, metabolic/endocrine, neurologic/neurovascular conditions, and other medical causes.

Cause of Death by Category

Table 5 presents pregnancy-associated deaths by category. Medical causes accounted for half of all pregnancy-associated deaths, most commonly "other medical conditions" (54.6%), cardiovascular conditions (16.4%), and infection (16.4%). Among accidental deaths, motor vehicle crashes were the leading cause (65.0%), followed by poisoning or overdose (25.0%). Subcategories for homicide and suicide deaths were suppressed to protect confidentiality.

Among pregnancy-related deaths (n=37), medical causes predominated (83.8%), most commonly other medical conditions (59.5%). A small number of deaths were due to homicide or suicide (16.2%), primarily involving hanging or firearms. Because of the limited number of cases, detailed breakdowns are not shown to protect confidentiality.

Table 5. Pregnancy-Associated Deaths by Cause of Death Category, Nebraska 2014–2023 (Excluding Unknown; n=110*)

Medical (50.0%; n=55)		Accidental (36.4%; n=40)		Homicide/Suicide (13.6%; n=15)	
Cause of Death	**n (%)**	**Cause of Death**	**n (%)**	**Cause of Death**	**n (%)**
Cardiovascular Condition	9 (16.4%)	Motor Vehicle Crash	26 (65.0%)	Firearm	–‡
Infection	9 (16.4%)	Poisoning or Overdose	10 (25.0%)	Hanging	–
Cancer	7 (12.7%)	Fire or Burns	–	Sharp Instrument	–
Other Medical Conditions	30 (54.6%)	Other Accidental†	–	Fall	–

Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.
*Percentages are based on 110 pregnancy-associated and 37 pregnancy-related deaths with a known underlying cause. Three reviewed cases (including one pregnancy-related death) were classified as "Unknown cause," and one 2023 case remains under committee review and is not included.
† "Other accidental" includes drowning and cases involving medical or behavioral conditions reviewed as unintentional.
‡ Counts and percentages based on 1-5 deaths per cell are suppressed (shown as –) to protect confidentiality. Where suppressed values could be derived from row/column totals, additional cells are secondarily suppressed to prevent back-calculation.

When examining timing alongside cause of death, patterns varied across the perinatal period. During pregnancy, more than half of all pregnancy-associated deaths were due to medical causes (53.5%), followed by accidental and homicide/suicide causes, which made up the remainder. Within the first 42 days postpartum, most deaths were medical in nature (78.9%). In the late postpartum period (43–365 days after the end of pregnancy), deaths were more varied in causes. A plurality resulted from accidental causes (43.8%), about one-third were due to medical conditions (35.4%), and a smaller proportion were due to homicide or suicide (20.8%).

Among pregnancy-related deaths, all deaths during pregnancy and within 1-42 days postpartum were attributed to medical causes, whereas deaths occurring later in the postpartum year were primarily homicide or suicide. Due to confidentiality protections, no tables or figures are included for this section.

Cause of Death by Race/Ethnicity

Among pregnancy-associated deaths, medical causes were the leading category across all racial and ethnic groups, accounting for half of the deaths overall. Among non-Hispanic White women, 45.5% of deaths were due to medical causes, 41.6% were due to accidental causes, and 13.0% were homicide or suicide. Medical causes were the most common causes of death among non-Hispanic Black women (64.7%) and Hispanic women (58.3%). Data for other racial groups are not presented due to small numbers. Results should be interpreted with caution because of small sample sizes and data suppression. Race and ethnicity data for pregnancy-related deaths are not presented due to confidentiality protections.

Cause of Death by Age Group

Among pregnancy-associated deaths, medical causes accounted for half of all deaths, with proportions generally increasing with age—from 29% among women ages 20-24, 69.7% among those aged 30-34, and 61.5% among those aged 35 years and older (Fisher's exact test, p = 0.003). Accidental causes

were most common among younger women (20–29 years), while homicide and suicide deaths represented a small share across age groups.

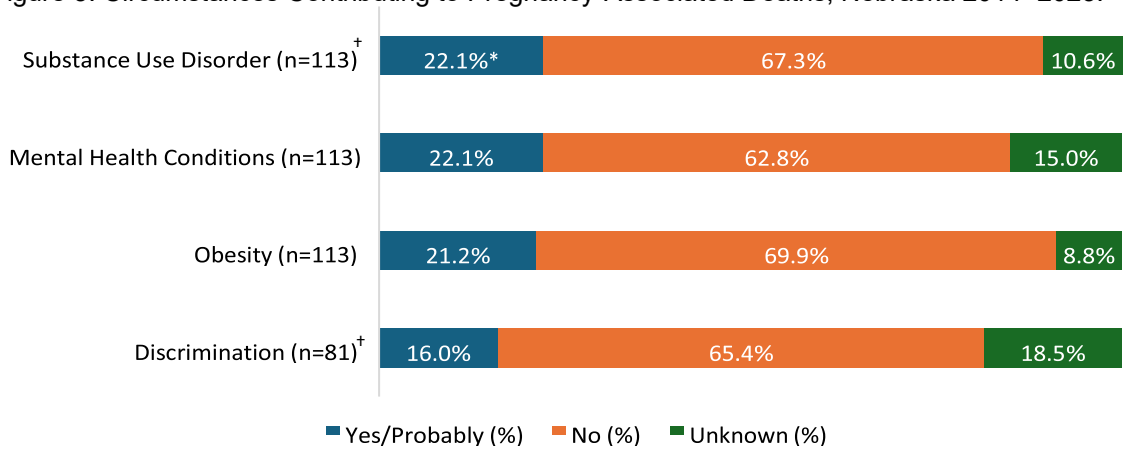
For pregnancy-related deaths, medical causes were the leading category across all ages, and homicide and suicide deaths occurred in small numbers. Age-specific results for pregnancy-related deaths are not presented to protect confidentiality.

Circumstances Contributing to Deaths

The MMRC evaluated selected health and social circumstances that may have contributed to each death, including substance use disorder, mental health conditions, obesity, and discrimination. Figure 5 illustrates the distribution of these contributing circumstances among pregnancy-associated deaths. The committee determined obesity contributed to approximately one in five cases (21.2%). Mental health conditions contributed to 22.1% and substance use disorder contributed to 22.1%. Discrimination was identified or suspected in 16.0% of reviewed cases occurring after May 2020, when this variable was first added to the committee's decision form.

Among pregnancy-related deaths, obesity was the most frequently identified contributor, present in nearly half of the deaths, while mental health conditions contributed to roughly one in five cases. Substance use disorder and discrimination were less commonly reported contributors, and several cases were classified as unknown due to limited available information.

Figure 5. Circumstances Contributing to Pregnancy-Associated Deaths, Nebraska 2014–2023.



Source: Nebraska Maternal Mortality Review Committee.
*Percentages are based on pregnancy-associated deaths for which the MMRC was able to determine contributing circumstances.
† For discrimination, the denominator is smaller (n=81) since this item was added in May 2020.
‡ One 2023 case remains under committee review and is not included in any category.

Preventability

The MMRC assesses each death for preventability—whether there was at least some chance that reasonable changes at any level could have prevented the death.

This section summarizes preventability among pregnancy-associated and pregnancy-related deaths from 2014 to 2023 and explores differences by year, race and ethnicity, age group, underlying cause, and timing of death.

Between 2014 and 2023, the MMRC determined that approximately 85% of pregnancy-associated deaths and nearly 90% of pregnancy-related deaths were preventable. Although year-to-year fluctuations are observed, differences are not statistically significant and are largely due to the small number of deaths occurring annually.

Preventability by Race/Ethnicity

Across all racial and ethnic groups, most pregnancy-associated deaths were considered preventable (Table 6). Similarly, most pregnancy-related deaths (n=38) were deemed preventable, though small numbers preclude detailed reporting by race and ethnicity.

Table 6. Preventability of Pregnancy-Associated Deaths by Race/Ethnicity, Nebraska 2014–2023 (n=113†).

Race/Ethnicity	Preventable n (%)	Not Preventable n (%)	Total n
Non-Hispanic White	66 (82.5%)	14 (17.5%)	80
Non-Hispanic Black	–*	–	17
Hispanic	–	–	12
Other‡	–	–	–
Total	96 (85.0%)	16 (14.2%)	113

Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.
* Counts and percentages based on 1-5 deaths per cell are suppressed to protect confidentiality. Where suppressed values could be derived from row/column totals, additional cells are secondarily suppressed to prevent back calculation.
† This table is based on 113 cases the MMRC reviewed. The 2023 pregnancy-associated death count includes one unreviewed open case, which is not included. Total includes one death with "Unable to Determine" preventability. This case is included in the total count but not shown as a separate category.
Pregnancy-related results are not presented due to small numbers.
‡ "Other race" includes Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and other. Individual categories are not reported due to small numbers.

Preventability by Age Group

Preventability remained high across all maternal age groups. The proportion of deaths deemed preventable ranged from 78.8% among women aged 30–34 years to 90.3% among those aged 25–29 years. Among pregnancy-related deaths (n=38), preventability was high across age groups, but detailed results are not presented due to small counts.

Preventability by Cause of Death

The majority of pregnancy-associated deaths were determined to be preventable across the leading underlying causes (Table 7). Preventability was highest for mental health- and injury-related deaths, while most cancer deaths were not considered preventable.

Table 7. Preventability of Pregnancy-Associated† Deaths by Leading Underlying Cause, Nebraska 2014–2023

Cause of Death	% Preventable
Injury	92%
Mental Health Conditions	100%
Cardiovascular Conditions	89%
Infection	78%
Hemorrhage (Excludes Aneurysm or Cerebrovascular Accident (CVA))	83%
Cancer	29%

Source: Nebraska Vital Records Office and Nebraska Maternal Mortality Review Committee.
* Only causes with at least six deaths are shown. Percentages are based on 110 pregnancy-associated deaths with a known underlying cause. Three reviewed cases were classified as "Unknown cause," and one 2023 case remains under committee review and is not included.
† Pregnancy-related results are not presented due to small numbers.

Preventability by Cause of Death Category

When examined by cause of death category, most pregnancy-associated deaths due to medical causes were determined to be preventable, with nearly three-quarters classified as such. All homicide and suicide deaths were considered preventable. The vast majority of accidental deaths were deemed preventable.

Among pregnancy-related deaths (n=37), nearly nine in ten were determined preventable. Most were due to medical causes, and all homicide and suicide deaths were also classified as preventable.

Preventability by Timing of Death

Preventability was high across all timing periods. Among pregnancy-associated deaths, roughly four out of five deaths that occurred during pregnancy or within six weeks postpartum were considered preventable. Among pregnancy-related deaths, most were determined to be preventable across all time periods, though small numbers limit detailed interpretation.

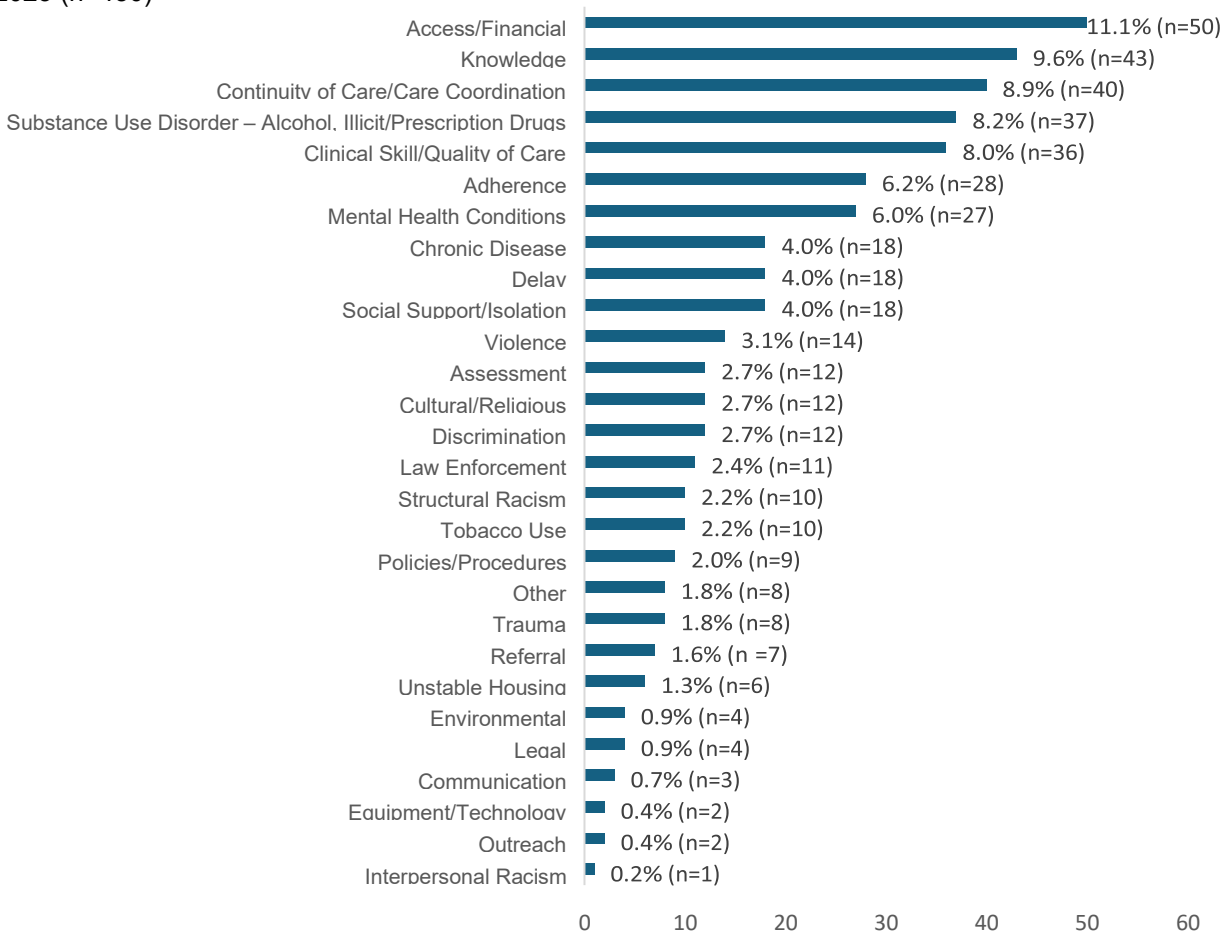
Contributing Factors

Two variables are used to describe contributing factors in this section, contributing factor class and contributing factor level. Contributing factor class refers to the specific type of issue identified—such as access or financial barriers, clinical skill or quality of care, or mental health conditions—and is defined on page 6 of the *Maternal Mortality Review Committee Decisions Form (Appendix A)*. Contributing factor level indicates where the issue occurred— at the patient or family, provider, facility, system, or community level. Together, these variables provide insight into both the nature of the issues contributing to deaths and the points in the care continuum where prevention efforts may be most effective.

Contributing Factor Classes

Figure 6 shows the distribution of contributing factor classes identified across reviewed deaths. The most common issues were access/financial barriers (11.1%), knowledge gaps (9.6%), continuity of care/care coordination (8.9%), and substance use disorder (8.2%). Other frequently cited factors included clinical skill/quality of care (8.0%) and adherence (6.2%).

Figure 6. Frequency of Contributing Factor Classes* among Pregnancy–Associated Deaths, Nebraska 2014–2023 (n=450)

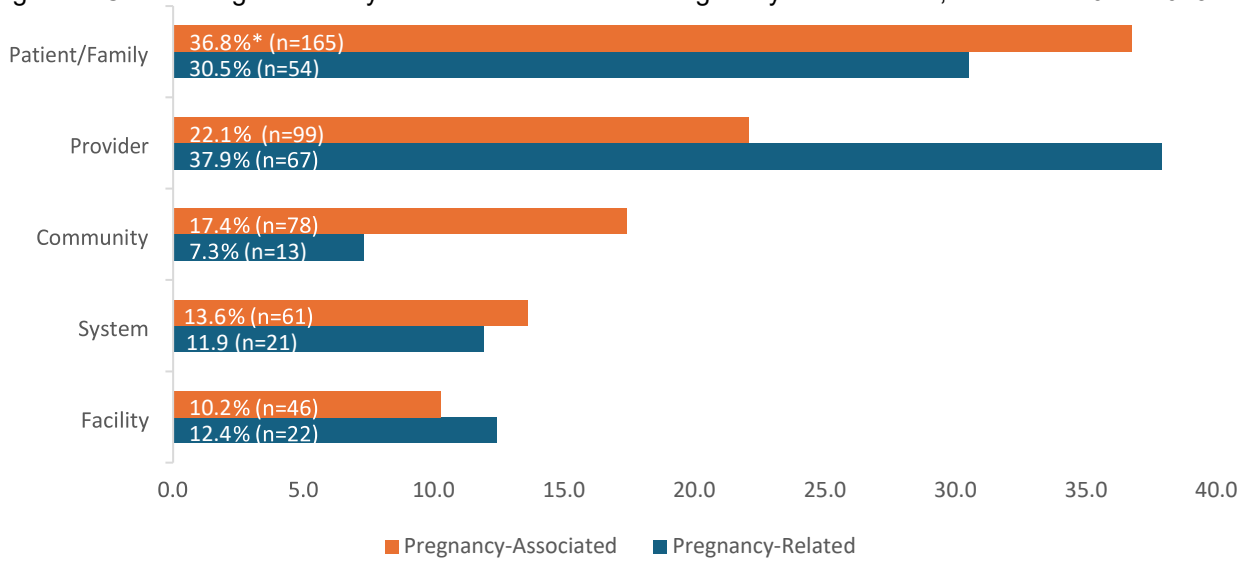


Source: Nebraska Maternal Mortality Review Committee.
* Definitions of contributing factor classes are provided in **Appendix A**. Counts and percentages are based on all contributing factors identified across reviewed deaths; more than one factor may be identified per case.

Contributing Factor Levels

Figure 7 compares contributing factor levels between pregnancy-associated and pregnancy-related deaths. Among pregnancy-associated deaths, most contributing factors occurred at the patient/family level (36.8%, n=165), followed by provider (22.1%, n=99) and community (17.4%, n=78) levels. Among pregnancy-related deaths, provider-level factors (37.9%, n=67) and patient/family-level factors (30.5%, n=54) were most common, followed by facility-level factors (12.4%, n=22).

Figure 7. Contributing Factors by Level of Influence and Pregnancy-Relatedness, Nebraska 2014–2023

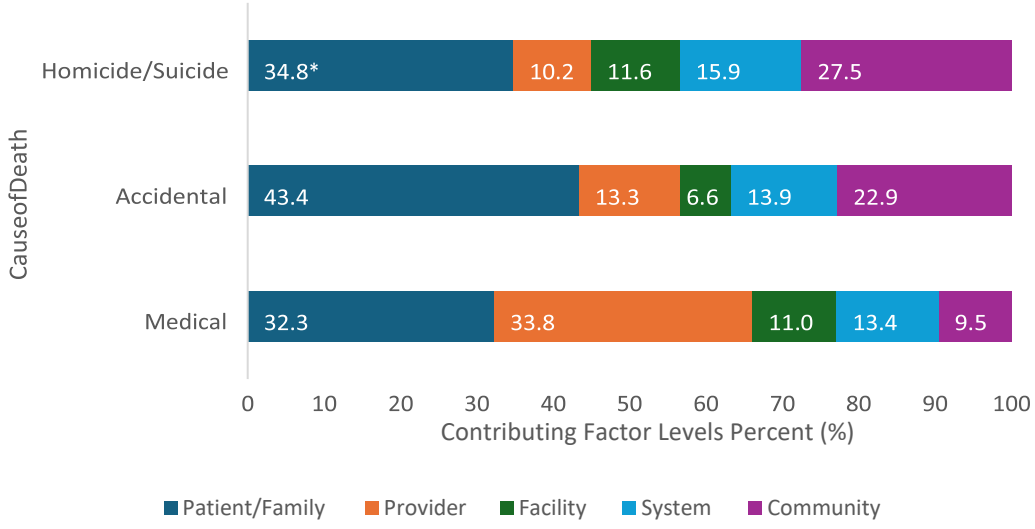


Source: Nebraska Maternal Mortality Review Committee.
* Percentages are calculated within each pregnancy-related group. Total contributing factors: 449 for pregnancy-associated deaths and 177 for pregnancy-related deaths.

Contributing Factors by Cause of Death

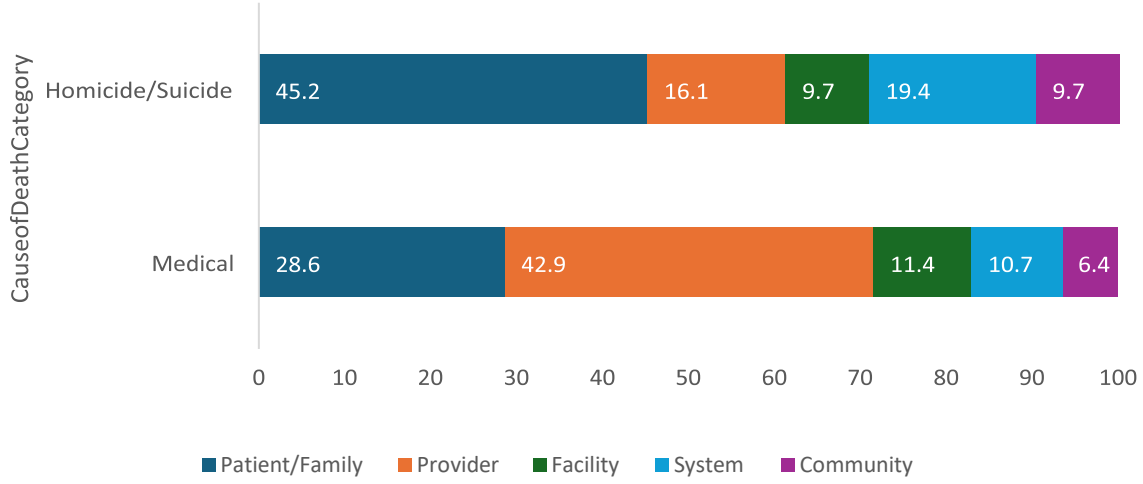
Patterns of contributing factors varied by cause of death and pregnancy-relatedness (Figures 8 and 9). Among pregnancy-associated deaths, patient/family- and community-level factors were most common in accidental and homicide/suicide deaths. Among pregnancy-related deaths, provider-level factors predominated in medical causes.

Figure 8. Distribution of Contributing Factor Levels by Cause of Death Category among Pregnancy Associated Deaths, Nebraska 2014–2023 (n=449 factors)



Source: Nebraska Maternal Mortality Review Committee.
* Percentages are calculated within each cause-of-death category.

Figure 9. Distribution of Contributing Factor Levels by Cause of Death Category among Pregnancy Related Deaths, Nebraska 2014–2023 (n=177 factors)



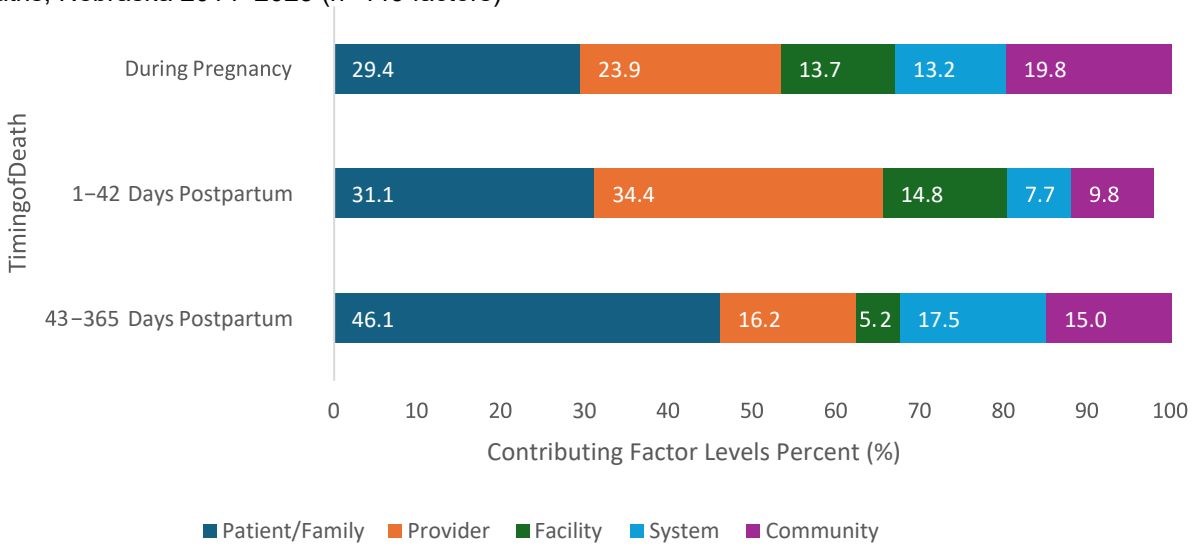
Source: Nebraska Maternal Mortality Review Committee.
* Percentages are calculated within each cause-of-death category.

Contributing Factors by Timing of Death

Patterns of contributing factors varied over time (Figures 10–11). Among pregnancy-associated deaths, patient/family- and provider-level factors were common throughout each time period.

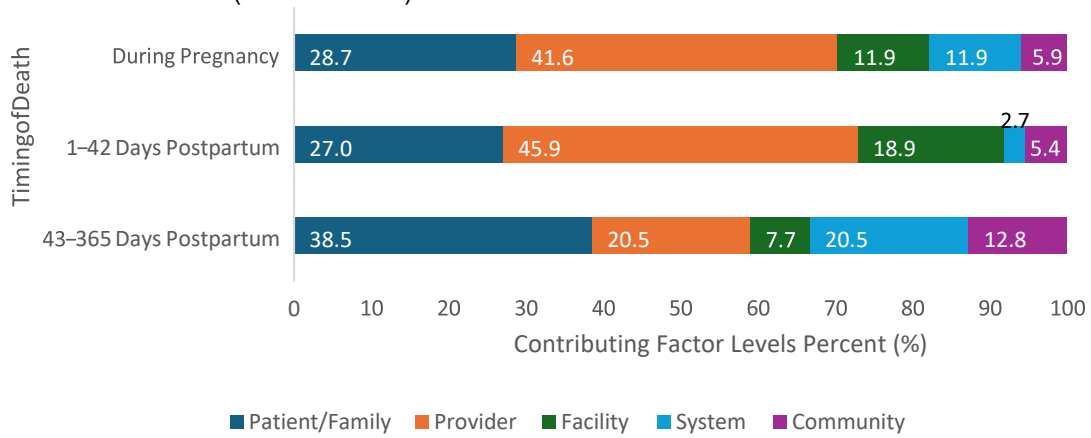
Among pregnancy-related deaths, provider-level factors were the most commonly identified contributing factors during pregnancy (41.6%) and within 42 days postpartum (45.9%). Among deaths occurring later in the postpartum period, patient/family-level factors were most commonly identified.

Figure 10. Distribution of Contributing Factor Levels by Timing of Death among Pregnancy-Associated Deaths, Nebraska 2014–2023 (n=449 factors)



Source: Nebraska Maternal Mortality Review Committee.
Percentages are calculated within each timing category.

Figure 11. Distribution of Contributing Factor Levels by Timing of Death among Pregnancy-Related Deaths, Nebraska 2014–2023 (n=177 factors)



Source: Nebraska Maternal Mortality Review Committee.
* Percentages are calculated within each timing category.

Recommendations

The MMRC has established seven priority recommendation topics from recurring themes found among all individual case recommendations. These topics were developed by MMRC members in 2022 and confirmed by community focus groups and statewide agency partners in 2024. Each priority recommendation topic is presented below with a few examples of actionable items based on individual case recommendations. MMRC recommendations provide opportunities for individuals, families, communities, providers, facilities, policy advocates, and organizations to address the drivers of maternal mortality and improve health outcomes. With collective effort, informed policy, and dedicated action, Nebraskans can create a future where everyone receives the care they deserve before, during, and after pregnancy.

Closed Loop Social Support

- The state of Nebraska should secure funding for programs that offer housing support, transportation, perinatal home visiting programs, and doula support services.
- Every provider involved in the care of pregnant and postpartum women should inquire about social determinants of health early in the patient-provider relationship, offer community resources, and anticipate barriers to accessing care.
- Providers should utilize community-based care coordinators/patient navigators to follow up with individuals in their community to determine barriers to care and facilitate access.

Healthcare Best Practice Adoption

- OBGYN and prenatal care providers should offer ongoing, personalized postpartum support.
- Patients, families, and communities should receive education on urgent maternal warning signs to identify severe symptoms and seek evaluation by a healthcare provider when indicated.
- The state should adopt a standardized Perinatal Hospital Regionalization system to ensure patients receive risk-appropriate care.

Non-Discriminatory Practices

- Medical providers, law enforcement officers, and social service providers should be required by licensing, affinity, and/or credentialing groups to receive ongoing education responsive to local needs and services.
- Women should have access to doula support and services for pregnant and postpartum women.

Behavioral Health Access

- Providers should perform universal screenings for substance use disorder and mental health conditions before, during, and after pregnancy.
- Facilities should offer non-punitive, evidence-based support for pregnant women with substance use disorder.
- The state should allocate resources to invest in community-based programs that provide mental health and substance use treatment that includes harm reduction approaches.

Care Continuity

- A primary care provider should be established for every person. Prenatal care providers should provide a referral and warm hand-off to a primary care provider as appropriate.
- The state, in collaboration with payors and healthcare providers, should increase funding for access to, and enrollment in evidence-based home visiting services across the state.

Medical Care Access

- Healthcare facilities and insurance providers should continue to invest in digital practices and technologies like remote patient monitoring, mobile/satellite clinics, and telehealth.
- The state should allocate funding to recruit and retain mental health and substance use disorder treatment providers in areas where access is limited.
- Supports should be put in place to ensure patients have access to contraceptive options of their choosing, including ensuring the amount of time needed for appointment/recovery for long-term contraceptive options is feasible with lifestyle, work, childcare, etc.

Domestic Violence Safety Plan Development

- Healthcare facilities and domestic violence/sexual assault advocacy programs should create and maintain partnerships to facilitate warm hand-offs when someone discloses intimate partner violence.
- Healthcare providers should receive ongoing education and information about best practices to identify domestic violence, implement screenings, and provide referrals to services.

References

Callahan, T., Zaharatos, J., St Pierre, A., Merkt, P. T., & Goodman, D. (2021). Enhancing Reviews and Surveillance to Eliminate Maternal Mortality. *Journal of women's health (2002)*, *30*(8), 1068–1073. https://doi.org/10.1089/jwh.2021.0357

Health Resources and Services Administration (HRSA) (2025). How We Define Rural. https://www.hrsa.gov/rural-health/about-us/what-is-rural

Neb. Rev. Stat. § 71-3404

Appendix A.

Maternal Mortality Review Committee Decisions Form v24.3

Adapted from CDC's Maternal Mortality Review Information Application (MMRIA) Decisions Form, Version 24.3.

REVIEW DATE

Month/Day/Year

RECORD ID #

PREGNANCY-RELATEDNESS: SELECT ONE

☐ PREGNANCY-RELATED
A death during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy

☐ PREGNANCY-ASSOCIATED, BUT NOT-RELATED
A death during pregnancy 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

ESTIMATE THE DEGREE OF RELEVANT INFORMATION (RECORDS) AVAILABLE FOR THIS CASE:
These fields are for internal jurisdiction use in order to evaluate opportunities to gain better access to information for reviews.

☐ COMPLETE
All records necessary for adequate review of the case were available

☐ SOMEWHAT COMPLETE
Major gaps (i.e., information that would have been crucial to the review of the case)

☐ MOSTLY COMPLETE
Minor gaps (i.e., information that would have been beneficial but was not essential to the review of the case)

☐ NOT COMPLETE
Minimal records available for review (i.e., death certificate and no additional records)

DOES THE COMMITTEE AGREE WITH THE UNDERLYING[1] CAUSE OF DEATH LISTED ON DEATH CERTIFICATE?
The underlying cause of death determination as documented by a multidisciplinary MMRC may be different from the underlying cause of death used by pathologists in the course of death certification documented in the Vital Statistics system.

☐ YES ☐ NO

COMMITTEE DETERMINATION OF CAUSE(S) OF DEATH

IF PREGNANCY-RELATED, COMMITTEE DETERMINATION OF UNDERLYING[1] CAUSE OF DEATH
Refer to Appendix A for PMSS-MM cause of death list.

If a death is pregnancy-associated, not related then an underlying cause of death entry is not necessary. Use optional box below.

TYPE	OPTIONAL: CAUSE (DESCRIPTIVE)
UNDERLYING[1,2]	
CONTRIBUTING[2,3]	
IMMEDIATE[2]	
OTHER SIGNIFICANT[2]	

COMMITTEE DETERMINATIONS ON CIRCUMSTANCES SURROUNDING DEATH[4]

DID **OBESITY** CONTRIBUTE TO THE DEATH?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN
DID **DISCRIMINATION**[5] CONTRIBUTE TO THE DEATH?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN
DID **MENTAL HEALTH CONDITIONS** OTHER THAN SUBSTANCE USE DISORDER CONTRIBUTE TO THE DEATH?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN
DID **SUBSTANCE USE DISORDER** CONTRIBUTE TO THE DEATH?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN

MANNER OF DEATH

WAS THIS DEATH A SUICIDE?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN
WAS THIS DEATH A HOMICIDE?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN

IF ACCIDENTAL DEATH, HOMICIDE, OR SUICIDE, LIST THE MEANS OF FATAL INJURY

- ☐ FIREARM
- ☐ SHARP INSTRUMENT
- ☐ BLUNT INSTRUMENT
- ☐ POISONING/OVERDOSE
- ☐ HANGING/ STRANGULATION/ SUFFOCATION
- ☐ FALL
- ☐ PUNCHING/ KICKING/BEATING
- ☐ EXPLOSIVE
- ☐ DROWNING
- ☐ FIRE OR BURNS
- ☐ MOTOR VEHICLE
- ☐ INTENTIONAL NEGLECT
- ☐ OTHER, SPECIFY:
- ☐ UNKNOWN
- ☐ NOT APPLICABLE

IF HOMICIDE, WHAT WAS THE RELATIONSHIP OF THE PERPETRATOR TO THE DECEDENT?

- ☐ NO RELATIONSHIP
- ☐ PARTNER
- ☐ EX-PARTNER
- ☐ OTHER RELATIVE
- ☐ OTHER ACQUAINTANCE
- ☐ OTHER, SPECIFY:
- ☐ UNKNOWN
- ☐ NOT APPLICABLE

[1] Underlying cause refers to the disease or injury that initiated the chain of events leading to death or the circumstances of the accident or violence which produced the fatal injury.
[2] OPTIONAL field, CDC does not use this data.
[3] Add descriptions of contributors in the pathway between the immediate and underlying cause of death, as provided by the committee. Note that this is different from the contributing factors worksheet on page 2.
[4] If "Yes" or "Probably" is selected for preventable deaths, then an aligned contributing factor class and description would be expected in the grid on page 2.
[5] As described in Appendix B.

COMMITTEE DETERMINATION OF 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.

WAS THIS DEATH PREVENTABLE?	☐ YES	☐ NO
CHANCE TO ALTER OUTCOME[6]	☐ GOOD CHANCE ☐ NO CHANCE	☐ SOME CHANCE ☐ UNABLE TO DETERMINE

CONTRIBUTING FACTORS AND RECOMMENDATIONS FOR ACTION (Entries may continue to grid on page 3)

CONTRIBUTING FACTORS WORKSHEET

What were the factors that contributed to this death? Multiple contributing factors may be present at each level: Choose one contributing factor per row until all contributing factors have been identified and described.

RECOMMENDATIONS OF THE COMMITTEE

If there was at least some chance that the death could have been averted, what were the specific and feasible actions that, if implemented or altered, might have changed the course of events? Develop one recommendation per row until all contributing factors have been addressed.

DESCRIPTION OF ISSUE (enter a description for EACH contributing factor listed)	**CONTRIBUTING FACTOR** (enter one per row; repeat as needed if a contributor has more than one recommendation)	**LEVEL**	**COMMITTEE RECOMMENDATION** [Who?] should [do what?] [when?] Map recommendations to contributing factors; repeat as needed if a recommendation has more than one contributor.	**LEVEL**	**PREVENTION TYPE** (choose below)	**EXPECTED IMPACT** (choose below)

CONTRIBUTING FACTOR KEY (DESCRIPTIONS IN APPENDIX B)

- Access/financial
- Adherence
- Assessment
- Chronic disease
- Clinical skill/quality of care
- Communication
- Continuity of care/care coordination
- Cultural/religious
- Delay
- Discrimination
- Environmental
- Equipment/technology
- Interpersonal racism
- Knowledge
- Law Enforcement
- Legal
- Mental health conditions
- Outreach
- Policies/procedures
- Referral
- Social support/ isolation
- Structural racism
- Substance use disorder - alcohol, illicit/prescription drugs
- Tobacco use
- Trauma
- Unstable housing
- Violence
- Other

DEFINITION OF LEVELS

- PATIENT/FAMILY: A woman before, during or after a pregnancy, and her family, internal or external to the household, with influence on the woman
- PROVIDER: An individual with training and expertise who provides care, treatment, and/or advice
- FACILITY: A physical location where direct care is provided - ranges from small clinics and urgent care centers to hospitals with trauma centers
- SYSTEM: Interacting entities that support services before, during, or after a pregnancy - ranges from healthcare systems and payors to public services and programs
- 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

PREVENTION TYPE

- PRIMARY: Prevents the contributing factor before it ever occurs
- SECONDARY: Reduces the impact of the contributing factor once it has occurred (i.e., treatment)
- TERTIARY: Reduces the impact or progression of what has become an ongoing contributing factor (i.e., management of complications)

EXPECTED IMPACT

- SMALL: Education/counseling (community- and/or provider-based health promotion and education activities)
- MEDIUM: Clinical intervention and coordination of care across continuum of well-woman visits (protocols, prescriptions)
- LARGE: Long-lasting protective intervention (improve readiness, recognition and response to obstetric emergencies/LARC)
- EXTRA LARGE: Change in context (promote environments that support healthy living/ensure available and accessible services)
- GIANT: Address social drivers of health (poverty, inequality, etc.)

[6] If “Good Chance” or “Some Chance” are selected, then CDC considers this is a “Yes” in their analytic use of the preventability determination.

CONTRIBUTING FACTORS AND RECOMMENDATIONS FOR ACTION (Continued from page 2)

CONTRIBUTING FACTORS WORKSHEET

What were the factors that contributed to this death? Multiple contributing factors may be present at each level: Choose one contributing factor per row until all contributing factors have been identified and described.

RECOMMENDATIONS OF THE COMMITTEE

If there was at least some chance that the death could have been averted, what were the specific and feasible actions that, if implemented or altered, might have changed the course of events? Develop one recommendation per row until all contributing factors have been addressed.

DESCRIPTION OF ISSUE (enter a description for EACH contributing factor listed)	**CONTRIBUTING FACTOR** (enter one per row; repeat as needed if a contributor has more than one recommendation)	**LEVEL**	**COMMITTEE RECOMMENDATIONS** [Who?] should [do what?] [when?] Map recommendations to contributing factors; repeat as needed if a recommendation has more than one contributor.	**LEVEL**	**PREVENTION TYPE** (choose below)	**EXPECTED IMPACT** (choose below)

CONTRIBUTING FACTORS AND RECOMMENDATIONS FOR ACTION (Continued from page 3)

CONTRIBUTING FACTORS WORKSHEET

What were the factors that contributed to this death? Multiple contributing factors may be present at each level: Choose one contributing factor per row until all contributing factors have been identified and described.

RECOMMENDATIONS OF THE COMMITTEE

If there was at least some chance that the death could have been averted, what were the specific and feasible actions that, if implemented or altered, might have changed the course of events? Develop one recommendation per row until all contributing factors have been addressed.

DESCRIPTION OF ISSUE (enter a description for EACH contributing factor listed)	**CONTRIBUTING FACTOR** (enter one per row; repeat as needed if a contributor has more than one recommendation)	**LEVEL**	**COMMITTEE RECOMMENDATIONS** [Who?] should [do what?] [when?] Map recommendations to contributing factors; repeat as needed if a recommendation has more than one contributor.	**LEVEL**	**PREVENTION TYPE** (choose below)	**EXPECTED IMPACT** (choose below)

APPENDIX A. PMSS-MM CODES: IF PREGNANCY-RELATED,[7] COMMITTEE DETERMINATION OF UNDERLYING[1] CAUSE OF DEATH

Hemorrhage (Excludes Aneurysms or CVA)
10.1 - Hemorrhage – Uterine Rupture
10.2 - Placental Abruption
10.3 - Placenta Previa
10.4 - Ruptured Ectopic Pregnancy
10.5 - Hemorrhage – Uterine Atony/Postpartum Hemorrhage
10.6 - Placenta Accreta/Increta/Percreta
10.7 - Hemorrhage due to Retained Placenta
10.10 - Hemorrhage – Laceration/Intra-Abdominal Bleeding
10.9 - Other Hemorrhage/NOS

Infection
20.1 - Postpartum Genital Tract (e.g., of the Uterus/ Pelvis/Perineum/Necrotizing Fasciitis)
20.2 - Sepsis/Septic Shock
20.4 - Chorioamnionitis/Antepartum Infection
20.6 - Urinary Tract Infection
20.7 - Influenza
20.8 - COVID-19
20.10 - Pneumonia
20.11 - Other Non-Pelvic Infection (e.g., TB, Meningitis, HIV)
20.9 - Other Infection/NOS

Embolism (Excludes Cerebrovascular)
30.1 - Embolism – Thrombotic
30.9 - Other Embolism (Excludes Amniotic Fluid Embolism)/NOS

Amniotic Fluid Embolism
31.1 - Amniotic Fluid Embolism

Hypertensive Disorders of Pregnancy (HDP)
40.1 - Preeclampsia
50.1 - Eclampsia
60.1 - Chronic Hypertension with Superimposed Preeclampsia

Anesthesia Complications
70.1 - Anesthesia Complications

Cardiomyopathy
80.1 - Postpartum/Peripartum Cardiomyopathy
80.2 - Hypertrophic Cardiomyopathy
80.9 - Other Cardiomyopathy/NOS

Hematologic
82.1 - Sickle Cell Anemia
82.9 - Other Hematologic Conditions including Thrombophilias/TTP/HUS/NOS

Collagen Vascular/Autoimmune Diseases
83.1 - Systemic Lupus Erythematosus (SLE)
83.9 - Other Collagen Vascular Diseases/NOS

Conditions Unique to Pregnancy
85.1 - Conditions Unique to Pregnancy (e.g., Gestational Diabetes, Hyperemesis, Liver Disease of Pregnancy)

Injury
88.1 - Intentional (Homicide)
88.2 - Unintentional
88.9 - Unknown Intent/NOS

Cancer
89.1 - Gestational Trophoblastic Disease (GTD)
89.3 - Malignant Melanoma
89.9 - Other Malignancies/NOS

Other Cardiovascular Conditions (excluding cardiomyopathy, HDP, and CVA)
90.1 - Coronary Artery Disease/Myocardial Infarction (MI)/Atherosclerotic Cardiovascular Disease
90.2 - Pulmonary Hypertension
90.3 - Valvular Heart Disease Congenital and Acquired
90.4 - Vascular Aneurysm/Dissection (Non-Cerebral)
90.5 - Hypertensive Cardiovascular Disease
90.6 - Marfan Syndrome
90.7 - Conduction Defects/Arrhythmias
90.8 - Vascular Malformations Outside Head and Coronary Arteries
90.9 - Other Cardiovascular/NOS, including CHF, Cardiomegaly, Cardiac Hypertrophy, Cardiac Fibrosis, Non-Acute Myocarditis

Pulmonary Conditions (Excludes ARDS-Adult Respiratory Distress Syndrome)
91.1 - Chronic Lung Disease
91.2 - Cystic Fibrosis
91.3 - Asthma
91.9 - Other Pulmonary Disease/NOS

Neurologic/Neurovascular Conditions (Excluding CVA)
92.1 - Epilepsy/Seizure Disorder
92.9 - Other Neurologic Diseases/NOS

Renal Disease
93.1 - Chronic Renal Failure/End-Stage Renal Disease (ESRD)
93.9 - Other Renal Disease/NOS

Cerebrovascular Accident (CVA) not Secondary to HDP
95.1 - Cerebrovascular Accident (Hemorrhage/ Thrombosis/Aneurysm/Malformation) not Secondary to Hypertensive Disorders of Pregnancy

Metabolic/Endocrine
96.2 - Diabetes Mellitus
96.9 - Other Metabolic/Endocrine Disorders/NOS

Gastrointestinal Disorders
97.1 - Crohn's Disease/Ulcerative Colitis
97.2 - Liver Disease/Failure/Transplant
97.9 - Other Gastrointestinal Diseases/NOS

Mental Health Conditions
100.1 - Depressive Disorder
100.2 - Anxiety Disorder (including Post-Traumatic Stress Disorder)
100.3 - Bipolar Disorder
100.4 - Psychotic Disorder
100.5 - Substance Use Disorder
100.9 - Other Psychiatric Conditions/NOS

Unknown COD
999.1 - Unknown COD

[1] Underlying cause refers to the disease or injury that initiated the chain of events leading to death or the circumstances of the accident or violence which produced the fatal injury.
[7] Pregnancy-related death: death during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.

APPENDIX B. CONTRIBUTING FACTOR DESCRIPTIONS

LACK OF **ACCESS/FINANCIAL** RESOURCES
Systemic barriers, e.g., lack or loss of healthcare 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 TO MEDICAL RECOMMENDATIONS
The provider or patient did not follow protocol or failed to comply with standard procedures (i.e., non adherence to prescribed medications).

FAILURE TO SCREEN/INADEQUATE **ASSESSMENT** OF RISK
Factors placing the woman at risk for a poor clinical outcome recognized, and they were not transferred/transported to a provider able to 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 (PROVIDER OR FACILITY PERSPECTIVE)
Personnel were not appropriately skilled for the situation or did not exercise clinical judgment consistent with standards of care (e.g., error in the preparation or administration of medication or unavailability of translation services).

POOR **COMMUNICATION**/LACK OF CASE COORDINATION OR MANAGEMENT/ LACK OF CONTINUITY OF CARE (SYSTEM PERSPECTIVE)
Care was fragmented (i.e., uncoordinated or not comprehensive) among or between healthcare 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).

LACK OF **CONTINUITY OF CARE** (PROVIDER OR FACILITY PERSPECTIVE)
Care providers did not have access to woman'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. (Hardeman, 2022)[8]

ENVIRONMENTAL FACTORS
Factors related to weather or social environment.

INADEQUATE OR UNAVAILABLE **EQUIPMENT/TECHNOLOGY**
Equipment was missing, unavailable, or not functional, (e.g., absence of blood tubing connector).

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. (Hardeman, 2022) [8]

KNOWLEDGE - LACK OF KNOWLEDGE REGARDING IMPORTANCE OF EVENT OR OF TREATMENT OR FOLLOW-UP
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 ED visit for exacerbation of depression).

INADEQUATE **LAW ENFORCEMENT** RESPONSE
Law enforcement response was not in a timely manner or was not appropriate or thorough in scope.

LEGAL
Legal considerations that impacted 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.

INADEQUATE COMMUNITY **OUTREACH**/RESOURCES
Lack of coordination between healthcare system and other outside agencies/organizations in the geographic/cultural area that work with maternal health issues.

LACK OF STANDARDIZED **POLICIES/PROCEDURES**
The facility lacked basic policies or infrastructure germane to the woman's needs (e.g., response to high blood pressure, or a lack of or outdated policy or protocol).

LACK OF **REFERRAL** OR CONSULTATION
Specialists were not consulted or did not provide care; referrals to specialists were not made.

SOCIAL SUPPORT/ISOLATION - LACK OF FAMILY/ FRIEND OR SUPPORT SYSTEM
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. (Hardeman, 2022) [8]

SUBSTANCE USE DISORDER – ALCOHOL, ILLICIT/ PRESCRIPTION DRUGS
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 woman 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. Please provide description.

[8] Hardeman RR, et al. *Developing Tools to Report Racism in Maternal Health for the CDC Maternal Mortality Review Information Application (MMRIA): Findings from the MMRIA Racism & Discrimination Working Group*. Matern Child Health J. 2022.

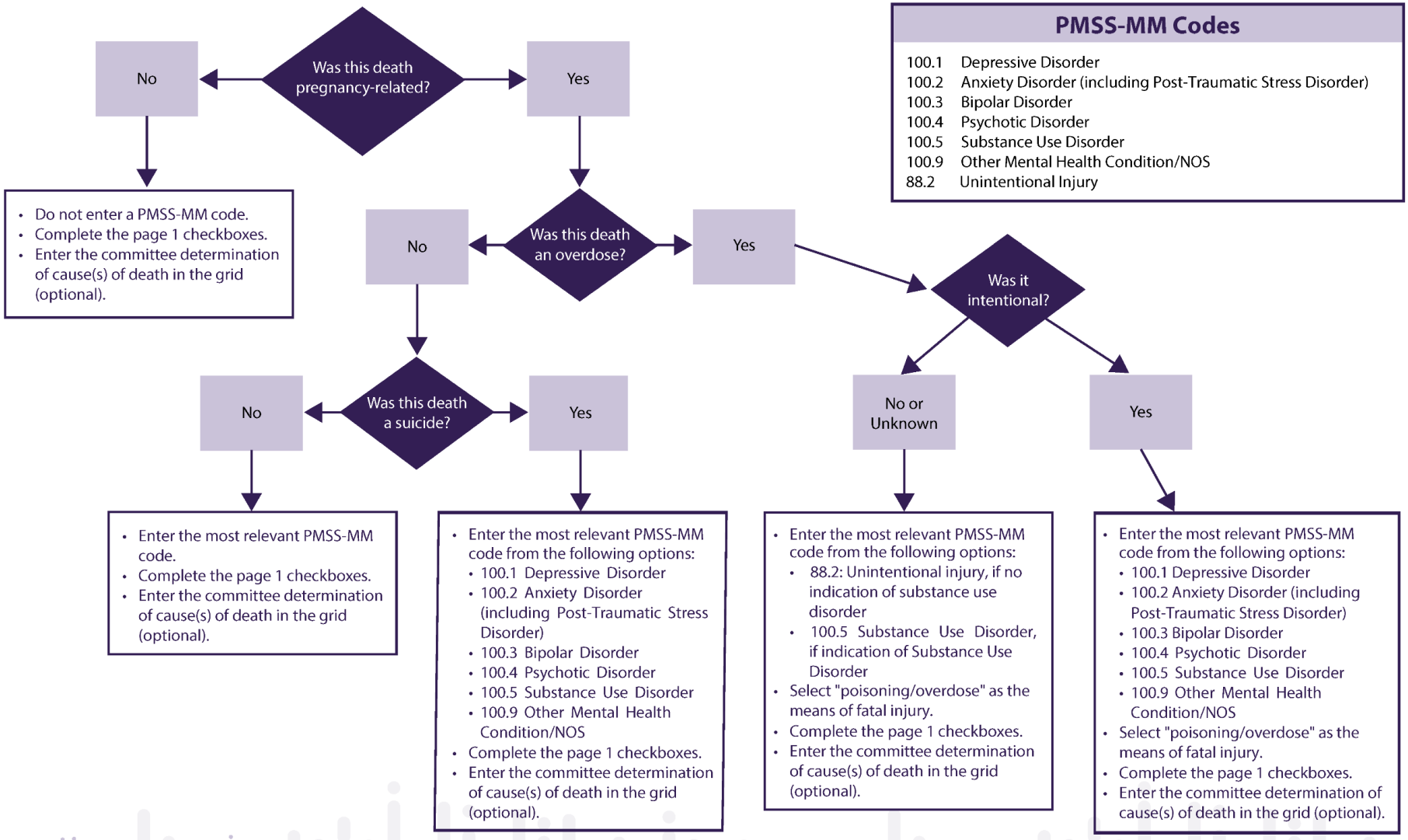
APPENDIX C. CONSENSUS PREGNANCY-RELATED CRITERIA FOR SUICIDE AND UNINTENTIONAL OVERDOSES[9, 10]

Present Y/N	Consensus pregnancy-related criteria for suicide and unintentional overdoses	Examples
	Pregnancy Complication	
	Increased pain directly attributable to pregnancy or postpartum events leading to self-harm or drug use that are implicated in suicide or unintentional drug-related death. *[consensus during pregnancy]*	Back pain, pelvic pain, kidney stones, cesarean incision, or perineal tear pain
	Traumatic event in pregnancy or postpartum (diagnosis of fetal anomaly, stillbirth, preterm delivery, neonatal or infant death, traumatic delivery experience, removal of children from custody) with a temporal relationship between the event leading to self-harm or increased drug use and subsequent death. *[consensus in all time periods]*	Stillbirth, preterm delivery, diagnosis of fetal anomaly, traumatic delivery experience, relationship destabilization due to pregnancy, removal of child(ren) from custody
	Pregnancy-related complication likely exacerbated by drug use leading to subsequent death. *[consensus in pregnancy – only time period considered]*	Placental abruption or preeclampsia in setting of drug use
	Chain of Events Initiated by Pregnancy	
	Cessation or attempted taper of medications for pregnancy-related concerns (neonatal/fetal exposure risk, fear of child protective service involvement) leading to maternal destabilization or drug use and subsequent death. Neonatal or fetal risk - *[consensus in all time periods]*. Child Protective Service involvement - *[consensus during pregnancy]*	Substance use pharmacotherapy (methadone or buprenorphine), psychiatric medications, pain medications
	Inability to access inpatient or outpatient addiction or mental health treatment due to pregnancy. *[consensus during and within 6 months of pregnancy]*	Health care professionals uncomfortable with treating pregnant women, facilities not available that accept pregnant women
	Perinatal psychiatric conditions resulting in maternal destabilization or drug use and subsequent death. *[consensus during and within 6 months of pregnancy]*	Depression diagnosed in pregnancy or postpartum resulting in suicide
	Recovery/stabilization of substance use disorder achieved during pregnancy or postpartum with clear statement in records that pregnancy was motivating factor with subsequent relapse and subsequent death. *[no consensus at any time period]*	Relapse leading to overdose due to decreased tolerance or polysubstance use
	Aggravation of Underlying Condition by Pregnancy	
	Worsening of underlying depression, anxiety or other psychiatric condition in pregnancy or postpartum period with documentation that mental illness led to drug use or self-harm and subsequent death. *[consensus during and within 6 months of pregnancy]*	Pre-existing depression exacerbated in the postpartum period leading to suicide
	Exacerbation, under-treatment or delayed treatment of pre-existing condition in pregnancy or postpartum leading to use of prescribed or illicit drugs resulting in death, or suicide. *[consensus during and within 6 months of pregnancy]*	Undertreatment of chronic pain leading to misuse of medications or use of illicit drugs, resulting in death
	Medical conditions secondary to drug use in setting of pregnancy or postpartum that may be attributable to pregnancy-related physiology and increased risk of complications leading to death. *[no consensus at any time period]*	Stroke or cardiovascular arrest due to stimulant use

[9] Smid MC et al, 2023. *Consensus pregnancy-related criteria for suicide and unintentional overdoses using a Delphi process.* Arch Womens Ment Health.

[10] The italicized text in brackets specify where the Delphi exercise with representatives from 48 MMRCs and eight experts in maternal mortality, substance use disorder, and maternal mental health reached consensus on the criterion. Lack of Delphi consensus as shown in brackets should not override committee consensus on a specific case. If "Yes" is chosen by the committee for at least one of the boxes under any of the three categories then that would constitute a pregnancy-related death.

APPENDIX D. CODING UNDERLYING CAUSE OF DEATH FOR SUICIDES AND OVERDOSES



APPENDIX E. FAQ: COMMITTEE DETERMINATIONS ON CIRCUMSTANCES SURROUNDING DEATH & MANNER OF DEATH

These frequently asked questions refer to the following fields on the committee decisions form:

Did obesity contribute to the death?
Did discrimination contribute to the death?
Did mental health conditions other than substance use disorder contribute to the death?
Did substance use disorder[11] contribute to the death?
Was this death a suicide?
Was this death a homicide?
If accidental death, homicide, or suicide, list the means of fatal injury.
If homicide, what was the relationship of the perpetrator to the decedent?

1. **Should the Circumstances Surrounding Death and the Manner of Death fields be completed for all pregnancy-associated deaths or just those determined to be pregnancy-related?**

   These fields only need to be completed for deaths determined to be pregnancy-related. If a death is not pregnancy-related, the only committee decisions form field that needs to be completed is the pregnancy-relatedness and degree of relevant information available selection, highlighted in light purple on page 1.

2. **Should the Circumstances Surrounding Death and the Manner of Death fields be completed in reference to the pregnant or postpartum woman, or the broader context surrounding the death?**

   The Circumstance and Manner fields refer to the woman's own experience. For example, if a pregnant or postpartum woman had a substance use disorder which contributed to the death, the Circumstance should be marked 'yes'. In contrast, if the death was a homicide where the perpetrator had a substance use disorder that contributed to causing a death, and the victim did not have a substance use disorder, or the victim had a substance use disorder that did not contribute to the death, the Circumstance should be marked 'no'.

3. **If substance use was involved in the death, should we choose 'yes' for substance use disorder circumstance?**

   This Circumstance refers to 'substance use disorder', not just substance use. The committee should only choose 'yes' or 'probably' if there is indication of a substance use disorder diagnosis or an expert on the committee (e.g., psychiatrist, psychologist, licensed counselor) who feels that the criteria for a diagnosis of substance use disorder are met based on the available information. Additionally, the Circumstance should only be marked 'yes' if the committee decides that the substance use disorder was a contributing factor in the death. If the pregnant or postpartum woman had a substance use disorder but this did not contribute to the death, the Circumstance should be marked 'no'.

   If the committee determines the death was an intentional or accidental overdose, this should be recorded as poisoning/overdose under means of fatal injury.

4. **For the substance use disorder and mental health conditions Circumstance fields, is a formal diagnosis required?**

   A diagnosis should ideally be indicated in the pregnant or postpartum woman's medical records. However, this may underestimate the number of pregnant or postpartum women with substance use disorder or mental health conditions if women are unable to access care or treatment. 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.

5. **If substance use disorder contributed to the death, but another mental health condition did not, should we also choose 'yes' for the mental health conditions Circumstance?**

   No, substance use disorder should be captured separately from other mental health conditions.

[11] 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 a pregnant or postpartum woman's health status (e.g., acute methamphetamine intoxication exacerbated pregnancy-induced hypertension, or the pregnant or postpartum woman was more vulnerable to infections or medical conditions).

6. Does the substance use disorder Circumstance include tobacco use?

No, substance use disorder as defined here does not include tobacco use. You would NOT mark the substance use disorder Circumstance as 'yes' or 'probably' based solely on tobacco use. If the committee determines that tobacco use was a contributor to the death, ensure that Tobacco Use is noted in the contributing factor worksheet with an actionable recommendation that addresses it.

7. When do we need to choose a means of fatal injury on the committee decisions form?

If the committee determines that a death was a pregnancy-related death and an accidental death, homicide, or suicide, they should also determine the means of fatal injury to be recorded on the committee decisions form. Unintentional and intentional overdoses should be recorded as poisoning/overdose.

8. If the committee selects 'yes' or 'probably' for any of the Circumstances (obesity, discrimination, mental health conditions, and/or substance use disorder), should they always document the corresponding contributing factor class and an actionable recommendation?

Typically, we expect the circumstances surrounding a death to align with a specified contributing factor class and recommendation. However, recommendations are focused on actions that would have prevented the death. If your committee determines that a circumstance such as obesity contributed to a death that is not preventable, they do not need to document a contributing factor class and recommendation.

9. When do we need to choose a relationship of the perpetrator to the decedent?

If the committee determines that a death was a homicide, they should also record the relationship of the perpetrator to the decedent on the committee decisions forms. The means of fatal injury should also be filled out for all homicides.

10. If certain deaths are not reviewed by our committee (for example, suicides and homicides), should we still complete the Circumstances Surrounding Death and Manner of Death fields?

No, these fields are intended to capture the committee decisions. If a death is not reviewed by the committee, the Circumstances Surrounding Death and Manner of Death fields should not be completed.

11. What if our determination for Manner of Death does not match the manner indicated on the death record?

The MMRC determined Manner of Death is intended to capture the decisions of the review committee, and it is expected that sometimes these decisions may differ from the death record. For example, an overdose may have an unknown manner of death on the death certificate, but relevant subject matter experts (e.g. medical examiner), could review additional information and determine that the overdose was intentional. The committee would then check 'yes' for the suicide Manner. There is also a place on the committee decisions form for indicating whether the committee agrees with the cause of death listed on the death record.

12. Are there opportunities for quality improvement with the information in the Circumstances Surrounding Death and Manner of Death data?

Yes, there are lots of opportunities using the Circumstances Surrounding Death and Manner of Death data. For example, all unintentional overdoses and overdoses of unknown intent with indication of substance use disorder should have an underlying cause of death PMSS-MM code of 100.5 (Substance Use Disorder) or 100.9 (Other Mental Health Conditions/NOS). If the substance use disorder Circumstance is marked 'yes', but the PMSS-MM code is 88.2 (Unintentional Injury), there may be discrepancies in how the MMRC is selecting PMSS-MM codes.

Another opportunity for quality improvement is to compare the obesity Circumstance with the decedent's actual BMI calculated using the height and weight provided in the records. Are there instances where your committee is selecting 'yes' when the BMI suggests the woman was at a healthy weight? Of note—this Circumstance is intended to capture whether obesity contributed to the death, not whether the pregnant or postpartum woman was obese / obesity was present.