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DEPT. OF HEALTH AND HUMAN SERVICES

Jim Pillen, Governor

December 31, 2024

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 Death Review Team. This report presents an overview of the manner and cause of maternal deaths in the State of Nebraska through 2022 as well as recommendations from the Maternal Mortality Review Committee.

Sincerely,

Charity Menefee

Charity Menefee
Director, Division of Public Health

Attachment

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Division of Public Health

State Maternal Death Review Team Annual Report

December 2024

Neb. Rev. Stat. § 71-3407

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 formally organized as a subcommittee under the Child and Maternal Death Review Team (CMDRT) and began reviewing maternal deaths that occurred in 2017. Statutory changes in 2022 further defined 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) through use of the Maternal Mortality Review Information Application (MMRIA), a tool used for standardizing case abstraction and analysis. The Nebraska 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 from deaths occurring from 2014-2022, describing an overview of the manner and cause of maternal deaths in the State of Nebraska as well as presenting recommendations from the MMRC.

Findings

To better understand maternal mortality in Nebraska, Table 1 provides a summary of pregnancy-associated and pregnancy-related deaths, calculated pregnancy-associated mortality ratios (PAMR), and calculated pregnancy-related mortality ratios (PRMR) for each year. A pregnancy-associated death is defined as the death of a woman while pregnant or anytime within one year of pregnancy, regardless of the cause (Callahan et al., 2021). In contrast, a pregnancy-related death is a maternal death directly due to a pregnancy complication or chain of events initiated by pregnancy or the physiological effects of pregnancy aggravating an unrelated condition (Callahan et al., 2021).

In Nebraska, there are too few pregnancy-related deaths on which to present comprehensive data on demographic characteristics, timing, category, and circumstances surrounding the deaths. These data are instead provided for pregnancy-associated deaths in this report. Recommendations developed by the MMRC are based upon deaths that are determined to be pregnancy-related and preventable.

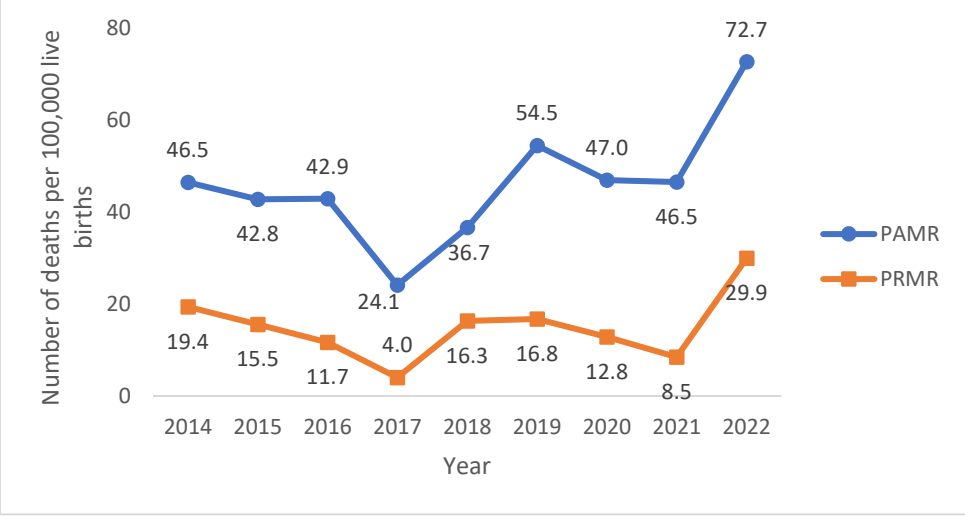
Table 1. Pregnancy-Associated and Pregnancy-Related Mortality, Nebraska 2014–2022.

Year	Pregnancy-Associated Deaths	Pregnancy-Related Deaths	Pregnancy-Associated Mortality Ratio (PAMR)*	Pregnancy-Related Mortality Ratio (PRMR)*
2014	12	5	46.5	19.4
2015	11	-	42.8	15.5
2016	11	-	42.9	11.7
2017	6	-	24.1	4.0
2018	9	-	36.7	16.3
2019	13	-	54.5	16.8
2020	11	-	47.0	12.8
2021	11	-	46.5	8.5
2022	17	7	72.7	29.9
Total	101	33	45.7	14.9

Source: Nebraska DHHS 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, while 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 birth certificate records reflecting resident, occurrent births.
% Ratios based on counts less than 20 should be interpreted with caution.
- Cells with counts of 1-5 are suppressed to maintain individual confidentiality.

While the PAMR and PRMR shown in Figure 1 vary from year to year, neither the overall trend from 2014 to 2022, nor the specific increase from 2021 to 2022 represent statistically significant differences. In a small population like Nebraska, it is common to observe year-to-year fluctuations in mortality rates due to small changes in the number of deaths, which may not reflect a meaningful trend. The team continues to monitor trends over time and maintains the importance of making recommendations to avoid any preventable maternal deaths.

Figure 1. Pregnancy-Associated Mortality Ratio (N=101) and Pregnancy-Related Mortality Ratio (n=33), Nebraska 2014-2022.



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

Demographic characteristics of individuals who experienced pregnancy-associated deaths in Nebraska from 2014-2022 are shown in Table 2.

Women ages 30-34 years made up the largest proportion of deaths, accounting for 31.7% of all cases. Among all the age groups, women ages 25-29 has the lowest PAMR, with 35.1 deaths per 100,000 live births. The highest PAMR was among women aged 40 and older, where the ratio was 150.5 deaths per 100,000 live births. The PAMR for the 40+ age group was statistically higher compared to the 20-24 ($p=0.008$), 25-29 ($p<0.001$), 30-34 ($p=0.004$), and 35-39 ($p=0.03$) age groups. The wide confidence interval for this age group (46.2-254.8) reflects greater variability in the estimate due to the smaller sample size yet indicates an elevated risk.

The PAMR for non-Hispanic Black women (85.5 deaths per 100,000 live births) was 3.2 times that of Hispanic women (27.1 deaths per 100,000 live births), a statistically significant difference ($p=0.006$). Additionally, the PAMR for non-Hispanic Black women was significantly higher than non-Hispanic White women (46.6 deaths per 100,000 live births; $p=0.04$).

The PAMR for high school graduates was 83.0 deaths per 100,000 live births, more than two times the rate for women with college credit or a higher degree, who experienced a PAMR of 33.3 per 100,000 live births. This difference was statistically significant ($p<0.001$). Additionally, women with grade 12 education or less had a PAMR of 59.0 per 100,000 live births, which was higher than the rate for those with college credit or a higher degree, with a borderline statistical significance of $p=0.05$.

There were not statistically significant differences in PAMR by geographic unit. However, among body mass index (BMI) groups, there were significant differences: the PAMR for the healthy weight group was 20.7 per 100,000 live births, compared to 46.4 for the obese group ($p=0.006$) and 92.1 for the underweight group ($p=0.001$).

Table 2. Pregnancy-Associated Deaths by Selected Demographic Characteristics, Nebraska 2014-2022
(Pregnancy-Associated Deaths n=101. Total Live Births N=220,937).

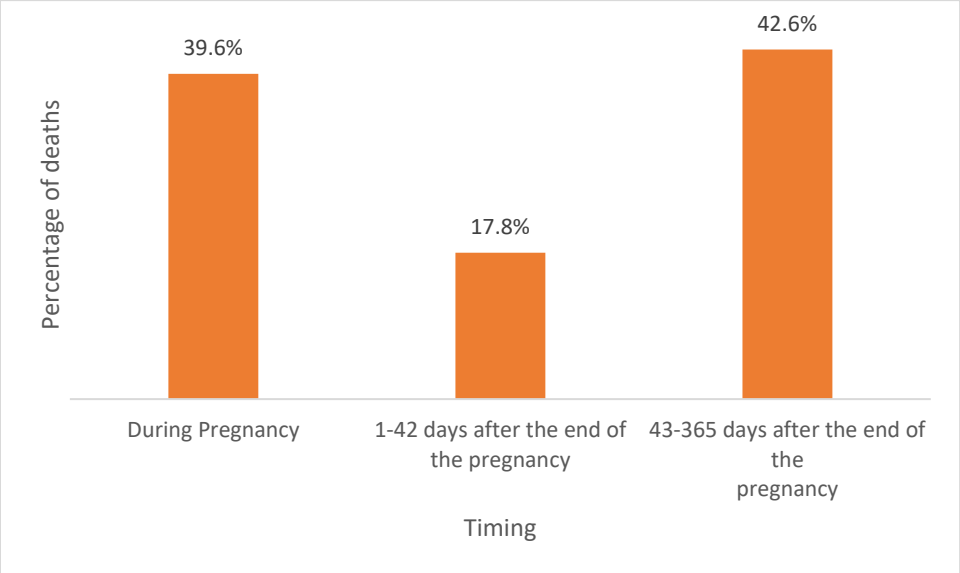
Demographic Characteristic	Count	%	Pregnancy-Associated Mortality Ratio (PAMR)*	95% CI	Total Live Births
Age group					
<20	0	N/A	N/A	N/A	9,671
20-24	20	19.8	49.2	27.7-70.8	40,630
25-29	25	24.8	35.1	21.3-48.9	71,235
30-34	32	31.7	48.4	31.6-65.1	66,152
35-39	16	15.8	57.3	29.2-85.4	27,916
40+	8	7.9	150.5	46.2-254.8	5,316
Race and ethnicity					
Non-Hispanic White	73	72.3	46.6	36.1-57.1	156,496
Non-Hispanic Black	14	13.9	85.5	44.2-126.8	16,380
Hispanic	-	-	27.1	10.3-43.9	-
Other	-	-	36.0	0.7-71.3	-
Education					
12th Grade or Less	-	-	59.0	31.5-90.5	-

Demographic Characteristic	Count	%	Pregnancy-Associated Mortality Ratio (PAMR)*	95% CI	Total Live Births
High School Graduate	35	34.7	83.0	56.9-111.5	42,160
College Credit or Higher	49	50.5	33.3	24.8-42.4	153,146
Unknown	-	-	-	-	-
Geographic Unit					
Metropolitan	66	65.3	48.4	36.8-61.8	136,404
Micropolitan	17	16.8	34.9	18.3-51.5	48,665
Rural	18	17.8	63.9	34.4-93.5	28,154
Pre-pregnancy BMI					
Underweight (BMI <18.5)	6	5.9	92.1	18.4-165.9	6,512
Healthy Weight (BMI 18.5-24.9)	20	19.8	20.7	11.6-29.8	96,678
Overweight (BMI 25.0-29.9)	21	20.8	36.3	20.8-51.9	57,811
Obese (BMI ≥30)	27	26.7	46.4	28.9-63.9	28,228
Unknown	27	-	-	-	1,692

Source: Nebraska DHHS 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, using the total number of live births as the denominator, based on Nebraska birth records reflecting resident, occurrent births.
* Ratios based on counts less than 20 should be interpreted with caution.
- Cells with counts of 1-5 are suppressed to maintain individual confidentiality.
CI = Confidence Interval, calculated using a factor based on a Poisson variable of the number of deaths (CDC, 2004).
BMI was calculated based on the woman's weight before pregnancy, as on the newborn's birth certificate.
Other race included Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and other.

Figure 2 shows the timing of pregnancy-associated deaths in Nebraska from 2014-2022. While a combined majority of deaths occurred during (39.6%, n=40) or shortly after (17.8%, n=18) the end of the pregnancy, a substantial portion of pregnancy-associated deaths occurred between 43 to 365 days after the end of the pregnancy (42.6%, n=43).

Figure 2. Timing of Pregnancy-Associated Deaths, Nebraska 2014-2022 (N=101).



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

The Committee determined that accidental deaths accounted for the largest proportion of deaths among the three categories of causes at 44.6% (n=45), with motor vehicle crashes being the most common in this category (46.7%, n=21) (Table 3). Medical causes represented 41.6% percent of deaths, with cardiovascular conditions (16.7%, n=7) and infections (14.3%, n=6) as subcategories, though a majority were categorized under other medical conditions (69%, n=29). Homicide and suicide comprised 13.9% (n=14) of deaths, with firearm as the primary mechanism within this category (42.39%, n=6).

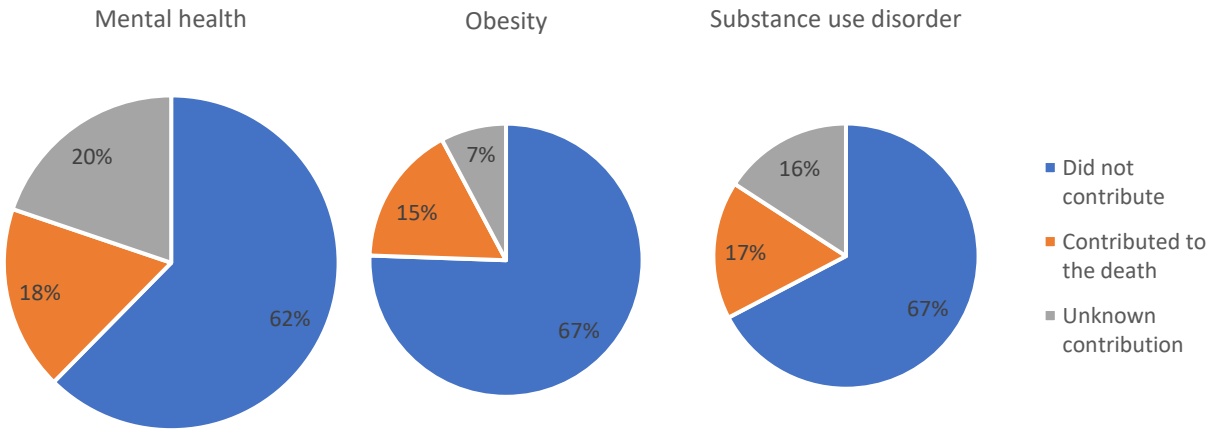
Table 3. Pregnancy-Associated Deaths by Category, Nebraska 2014-2022 (N=101).

Accidental (44.6%; n=45)		**Homicide/Suicide (13.9%; n=14)**		**Medical (41.6%; n=42)**	
Cause	**Column percent, n**	**Cause**	**Column percent, n**	**Cause**	**Column percent, n**
Fire or Burns	-	Firearm	42.9%; n=6	Cardiovascular condition	16.7%; n=7
Motor Vehicle Crash	46.7%; n=21	Hanging	-	Infection	14.3%; n=6
Poisoning or Overdose	-	Sharp instrument	-	Other medical condition	69.0%; n=29

- Cells with counts of 1-5 are suppressed to maintain individual confidentiality.
Source: Nebraska DHHS Vital Records Office and Nebraska Maternal Mortality Review Committee.

Figure 3 illustrates the Committee's decisions on whether mental health conditions, obesity, or substance use disorder contributed to pregnancy-associated deaths in Nebraska from 2014-2022. Obesity was found to be a contributing factor in 14.9% (n=15) of the deaths. The Committee identified a mental health condition as a contributing factor in 17.8% (n=18) of the cases. Substance use disorder was determined to have contributed to 16.8% (n=17) of deaths.

Figure 3. Circumstances Contributing to Pregnancy-Associated Deaths, Nebraska, 2014-2022 (N=101).



Source: Nebraska Maternal Mortality Review Committee.

Conclusion

This report provides a comprehensive review of all maternal mortality in Nebraska from 2014-2022, examining the demographic characteristics and health-related factors contributing to pregnancy-associated deaths. Through prioritized recommendations, including improved behavioral health access, care continuity, and non-discriminatory practices, the Nebraska MMRC is committed to reducing preventable maternal deaths and improving maternal health outcomes across the state.

Recommendations

The Nebraska MMRC has worked extensively to develop recommendations aimed at reducing preventable maternal mortality, covering a range of contributing factors identified through case reviews (Table 4). The Nebraska MMRC remains dedicated to advancing these priority areas, with plans to incorporate community input to ensure actionable and contextually relevant strategies for each recommendation.

Table 4. Recommendation Topic Areas and Strategies for Action to Reduce Preventable Maternal Mortality, Nebraska Maternal Mortality Review Committee, 2022.

Recommendation Topic Area	Strategies for Action
Behavioral Health Access	Increased access to mental health care Mental health support: screening, access, resources, and follow-up Improve follow-up for patients that screen positive for mental health concerns Substance use disorder screening, referral, and plan of safe care Substance abuse identification, treatment, and follow-up
Closed Loop Social Support	Non-Law Enforcement community response team Centralized referral system Universal utility access Access to and availability of community support services
Non-Discriminatory Practices	Unbiased, equitable treatment for all Awareness, training, and education of structural racism across all fields Universal healthcare
Healthcare Best Practice Adoption	Provider education and drills Appropriate evaluation at presentation Postpartum care and follow-up Address barriers to education adoption Early identification of high-risk obstetric conditions
Domestic Violence Safety Plan Development	Domestic violence education and resources Domestic violence screening, resources, and follow-up Domestic violence advocates receive training on pregnancy and safety planning Partnerships between hospitals and crisis centers
Care Continuity	Transition of care Emergency Department phone call within 24-48 hours of discharge
Medical Care Access	Expansion of telemedicine Eliminate barriers to prenatal care Perinatal regionalization

References

Callahan T, Zaharatos J, St. Pierre A, Merkt PT, Goodman D. (2021). Enhancing Reviews and Surveillance to Eliminate Maternal Mortality. *Journal of Women's Health*. Vol. 30(8).

Centers for Disease Control and Prevention. (2004). Vital Statistics of the United States: Mortality, 1999, Technical Appendix. Available at: https://www.cdc.gov/nchs/data/statab/techap99.pdf. Accessed November 1, 2024.

Neb. Rev. Stat. § 71-3404.