2016–17 Wisconsin Maternal Mortality Report

Released April 2022

Background and Overview

Maternal Mortality: Why it Matters

Maternal mortality is a key indicator of the quality of a community's health and health care. Every pregnancy-associated death represents not just the loss of a person's life, but the impact of that loss on families and communities. Though maternal health in the United States has improved greatly during the past century, recent increases in pregnancy-related deaths and significant racial disparities in maternal health demonstrate the opportunity for systematic improvements in the care of pregnant people and parents.

The State of Wisconsin's multidisciplinary Maternal Mortality Review Team (MMRT) reviews all deaths of Wisconsin residents during and within one year of pregnancy, with the goal of identifying system gaps and other opportunities for the prevention of future deaths. In recent years, the annual number of deaths in Wisconsin ranges from 25–45.

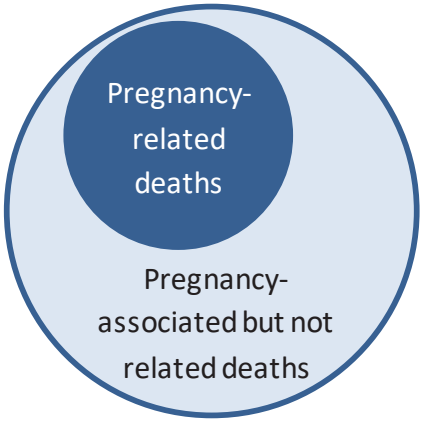
Key Definitions

Pregnancy-associated death is a death during or within one year of pregnancy, regardless of the cause. These deaths make up the scope of maternal mortality; within that scope are pregnancy-related deaths and pregnancy-associated but not related deaths.

Pregnancy-related death is a death during or within one year of pregnancy, from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.

Pregnancy-associated but not related death is a death during or within one year of pregnancy, from a cause that is not related to pregnancy.

Pregnancy-associated deaths



Pregnancy-associated deaths include all pregnancy-related and pregnancy-associated but not related deaths, as well as those that are unable to be determined.

Table of Contents

Included in This Report

This report will give a high-level overview of Wisconsin's pregnancy-associated deaths that occurred in 2016 and 2017, including determination of pregnancy-relatedness, demographics, cause of death, and recommendations to prevent future deaths.

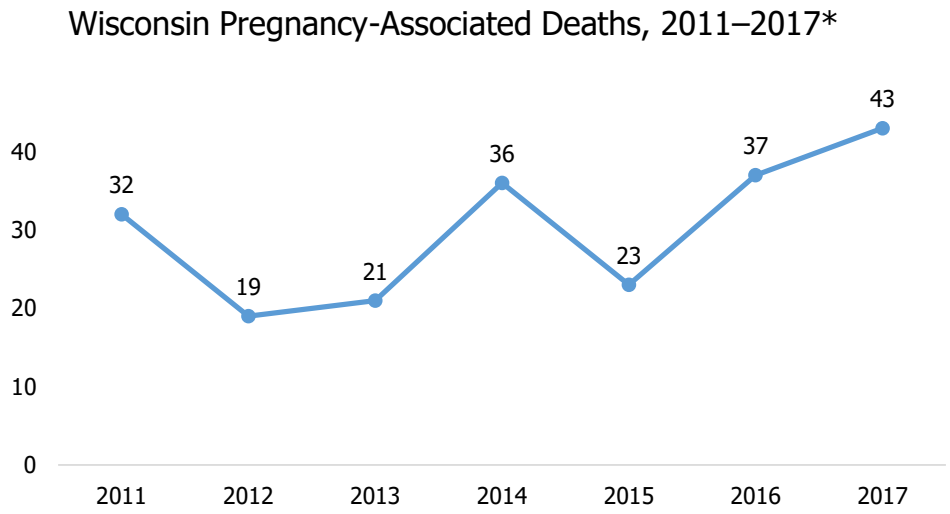
Please note that this report will maintain a high-level perspective in order to protect the confidentiality of those who lost their lives during and after pregnancy in 2016–17. Future reports will be able to combine additional years of data to allow for more in-depth analyses.

In Wisconsin, there were 80 pregnancy-associated deaths in 2016–17. This means 80 Wisconsin residents lost their lives during pregnancy or within one year of pregnancy, regardless of the cause. The Maternal Mortality Review Team (MMRT) determined that 33 of those deaths were pregnancy-related (41%).

Pregnancy-Associated Deaths

This section provides an overview of all pregnancy-associated deaths, including all deaths during or within one year of pregnancy, regardless of cause.

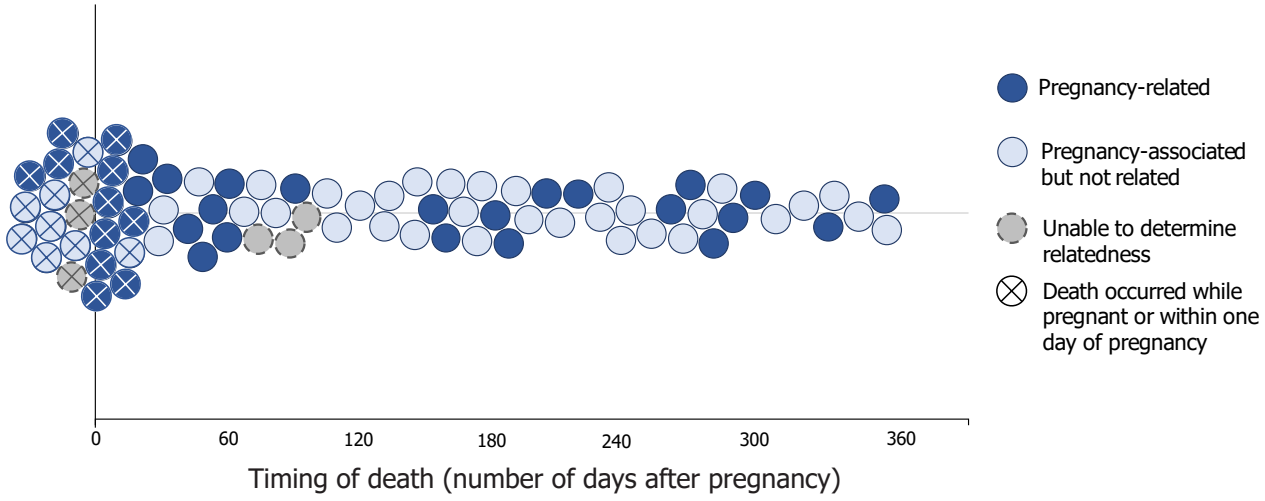
Trend Over Time



From 2011–2017, an average of 30 Wisconsin residents died during or within one year of pregnancy each year. Because pregnancy-associated death is a rare event, numbers vary from year to year, but do not show a clear increase or decrease during this time period.

Timing of Death

Most pregnancy-associated deaths occurred postpartum in 2016–17 (75% overall, including pregnancy-related deaths), with approximately **73% of pregnancy-related deaths occurring postpartum.**

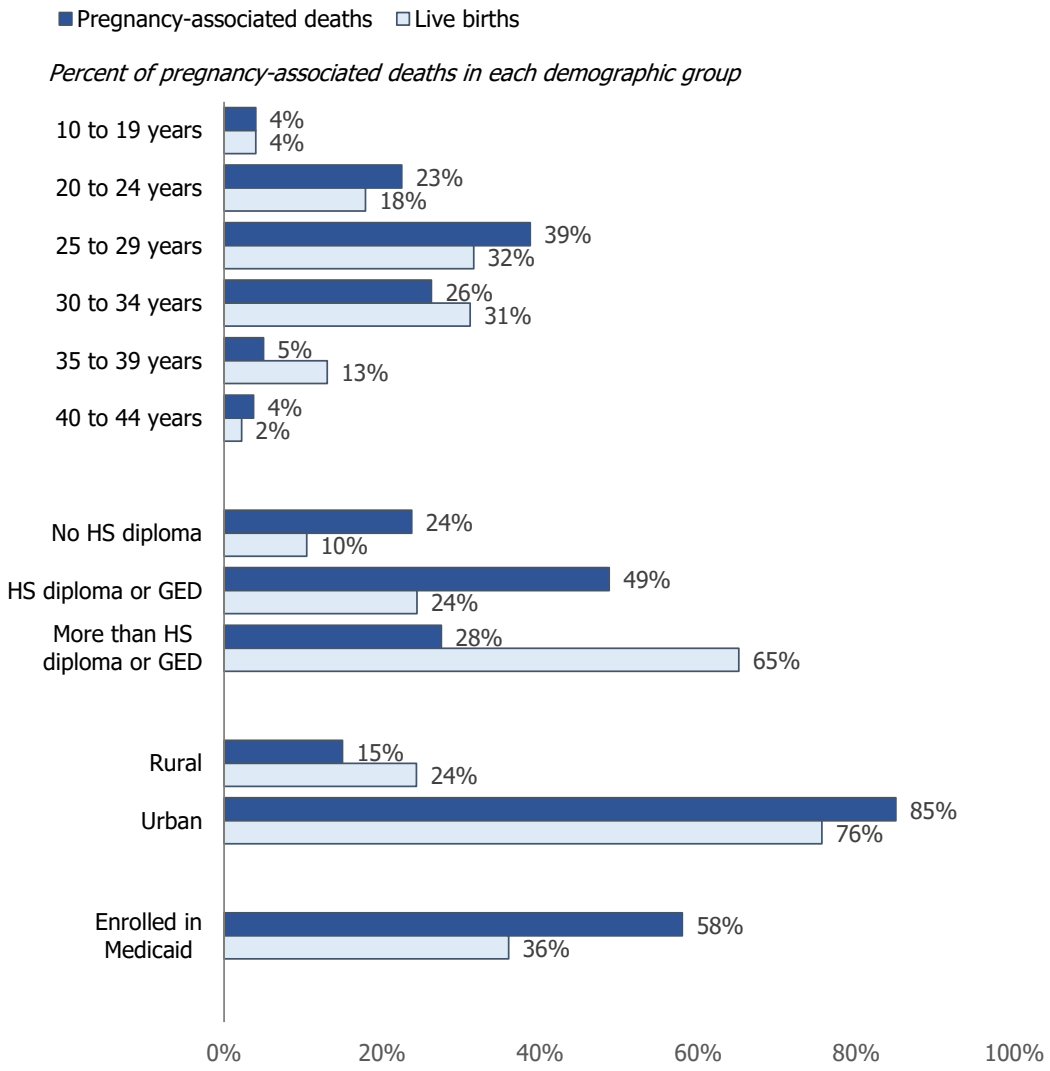


Demographics

Pregnancy-associated (PA) deaths do not occur in all demographic groups equally. We examined this inequity by comparing the percentage of PA deaths that occured among one group to the percentage of all live births that occurred among that same group. In 2016–2017, PA deaths disproportionately affected birthing people who:

- were between the ages of 20–29.
- had less education.
- lived in urban areas.
- were enrolled in Medicaid at the time of death.

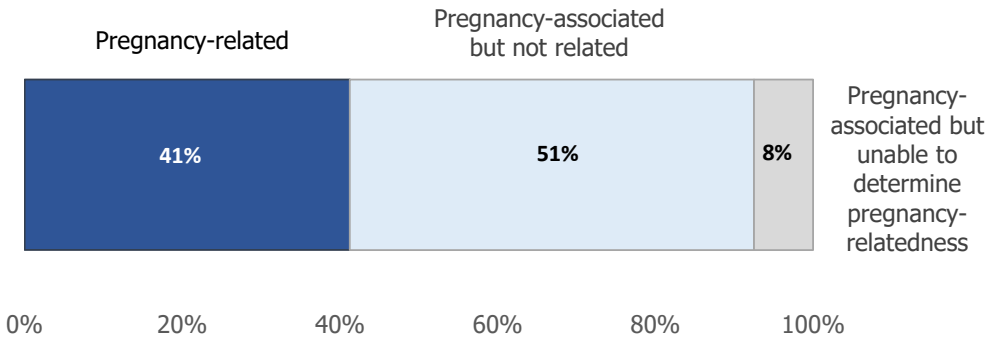
Pregnancy-Associated Deaths and Live Births by Maternal Demographics, Wisconsin, 2016–17



Pregnancy-Related Deaths

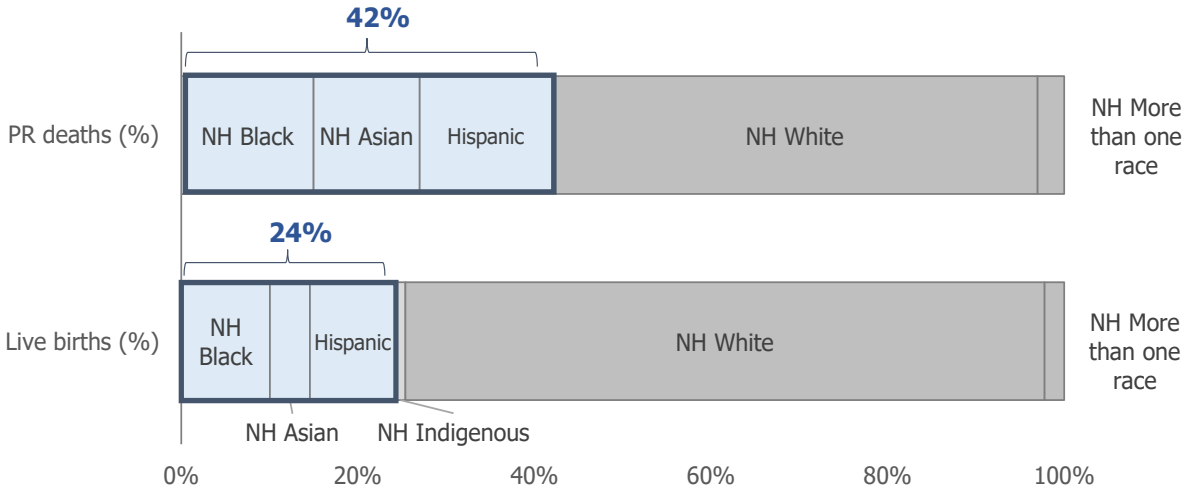
The Maternal Mortality Review Team (MMRT) reviews each death that occurs during pregnancy or within one year of pregnancy and determines whether the death was pregnancy-related (a death during or within one year of pregnancy, from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy) or pregnancy-associated but not related (a death during or within one year of pregnancy, from a cause that is not related to pregnancy). In rare instances, pregnancy-relatedness is unable to be determined.

Just under half of all 2016–17 pregnancy-associated deaths (41%) were determined to be **pregnancy-related.**



Race and Ethnicity

While **Non-Hispanic Black, Non-Hispanic Asian, and Hispanic mothers** made up only one fourth (24%) of Wisconsin births in 2016-17, they represented nearly one half (42%) of all pregnancy-related (PR) deaths in the same time period.



NH: Non-Hispanic

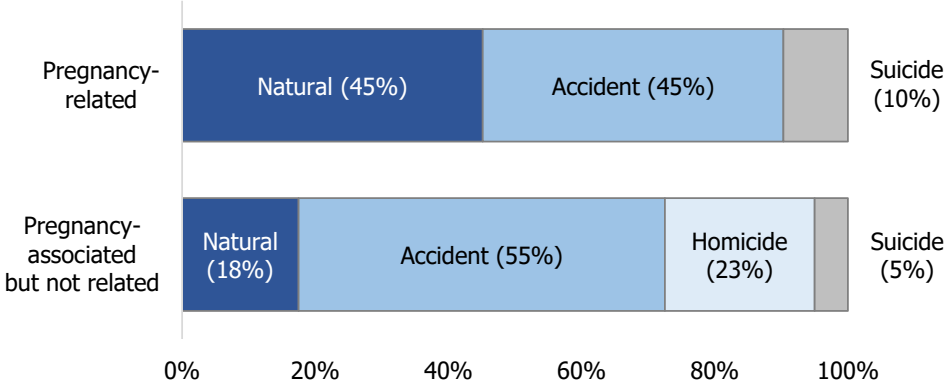
Cause and Manner of Death

Cause and manner of death are both determined by a coroner, certified medical examiner, or another medical professional who completes the death certificate. The three most common causes of pregnancy-related deaths in 2016–17 were:

- **52% Mental Health Conditions**: includes substance use disorders and overdoses
- **12% Hemorrhage** (excludes aneurysms and cerebrovascular accidents or strokes): blood loss
- **9% Cardiomyopathy:** a disease of the heart muscle that makes it harder for the heart to pump blood to the rest of the body, which can lead to heart failure

Other pregnancy-related causes of death were cancer, embolism, infection, cardiovascular conditions, injury, metabolic, and neurologic conditions.

Manner of Death by Pregnancy-Relatedness, Wisconsin, 2016–17



Natural: due to disease and/or the aging process

Accident: due to unintentional injury or poisoning

Homicide: due to injury or poisoning by another person intended to cause fear, harm, or death

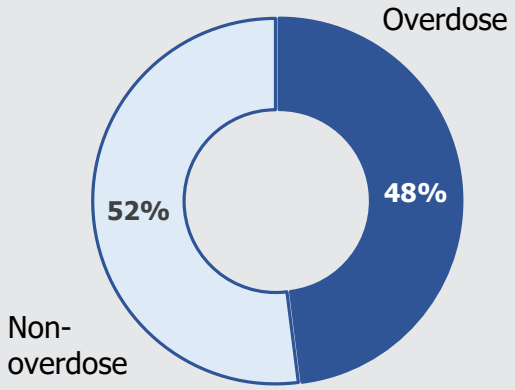
Suicide: due to intentional self-inflicted injury or poisoning

Pregnancy-Related Overdose

In recent years, overdose has become increasingly common in pregnancy-related (PR) deaths in Wisconsin, comprising nearly half of all PR deaths in 2016–17.

Please see Wisconsin Maternal Mortality Review: Pregnancy-associated overdose deaths (2016-2019), released in 2021, for more information.

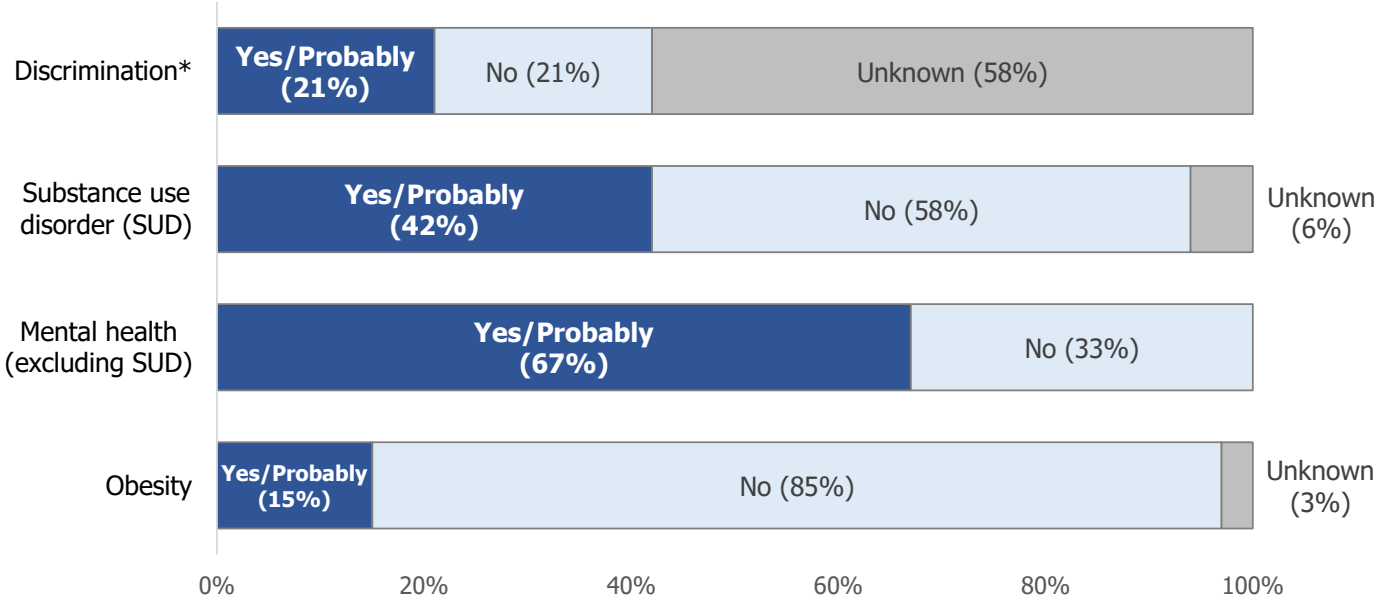
Nearly half (48%) of all pregnancy-related deaths in 2016–17 were **due to an overdose.**



Contributing Factors

While the person who completes the death certificate determines the cause of death, other factors may have contributed to the death as well. The MMRT determines whether the following four factors contributed to the death: discrimination, substance use disorder, mental health (other than substance use disorder), and obesity. These contributing factors were identified by CDC and are considered in each case review. As a reminder, these contributing factors do not necessarily have the same definitions as the official causes of death.

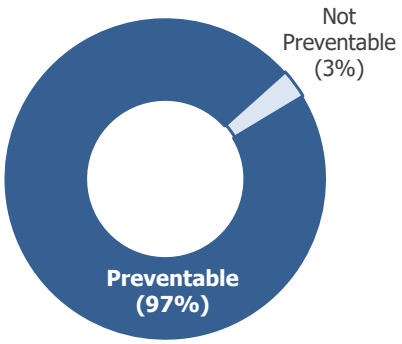
Did the following factors contribute to the death? (Pregnancy-related deaths only)



*Discrimination was added to the Maternal Mortality Review process after the Team had already begun reviewing 2016 and 2017 cases, meaning not all cases were evaluated for discrimination as a contributing factor. As discrimination is not always clearly discernable in medical or other treatment records, the MMR program is in the process of ensuring the MMRT has the necessary tools to accurately identify discrimination when applicable, which should reduce the number of cases with discrimination reported as "Unknown" going forward.

Preventability

Nearly all (97%) 2016–17 pregnancy-related deaths were **preventable**.



How is preventability determined?

When reviewing each case, the MMRT determines whether the death could have been prevented. 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.

MMRT Recommendations for Preventable Pregnancy-Related Deaths

The Maternal Mortality Review Team makes recommendations to prevent future deaths for each preventable pregnancy-associated case. Each recommendation is associated with a contributing factor category, which are categories of factors that contributed to the death, but did not necessarily directly cause the death. Below are the seven contributing factor categories with the most recommendations for 2016–17 pregnancy-related deaths, followed by a summary of the recommendations.

Top contributing factors:

- Access/Financial
- Clinical Skill/Quality of Care
- Continuity of Care/Care Coordination
- Knowledge
- Mental Health Conditions
- Policies and Procedures
- Substance Use Disorder

Recommendation Levels

 Provider

 Facility (clinics, hospitals, treatment centers, etc.)

 System (healthcare, payor to public services and programs, etc.)

 Community (statewide agencies, community organizations, policymakers, etc.)*

Recommendations in bold indicate those most often identified by the MMRT and are listed first.

* Community recommendations include a more specific description of who the recommendation refers to, due to the broad nature of the category

Access/Financial

 **Policymakers should expand Medicaid eligibility for all postpartum people to one year post-delivery**

 Expand access to mental health services via telehealth and provide continuous education and training to providers and staff to reduce stigma around substance use disorder

 Insurance companies should cover psychiatric telehealth services

Clinical Skill/Quality of Care

Discuss reproductive life planning with all patients before, during, and after pregnancy, including patients with chronic conditions that may affect pregnancy, and ensure patient access to necessary services to meet their goals

Ensure timely diagnoses and referrals to primary care and/or specialists as needed

Utilize shared decision-making with patients when creating a treatment plan

Explore alternative models of prenatal care for people with complex social situations, substance use disorder, and mental health disorders

The state should fund a strong Levels of Care system so that critical access hospitals can assess for labor and other medical conditions requiring urgent action and transfer appropriately

Continuity of Care/Care Coordination

Ensure continuity of care before, during, and after pregnancy, especially for those with complex medical histories, mental health diagnoses, and substance use disorder

For patients that have not established care, assign a care coordinator before patients are discharged to assign them a primary care or other provider, including a scheduled appointment, and ensure protocols are in place for following up with patients that miss appointments

Create a system-wide process to identify patients with frequent emergency department visits in order to refer them to medical case management

Ensure availability of culturally appropriate care at all facilities, including outreach to at-risk populations and interpretation services at every health care interaction when needed

Mental Health Conditions

Connect patients with comprehensive mental health services when there is a mental health diagnoses after delivery

Refer patients with mental health conditions to wraparound services for care coordination to help with appointments, medications, and navigating systems of care

Health departments and agencies working in the field of mental health should provide public education on identifying signs of self-harm and how to get help for self or others

Knowledge

Ensure patients and support people fully understand when and how to follow up post-discharge (for example warning signs to look for, who to call, when to go to the emergency room, etc. when applicable)

Educate patients on warning signs of ectopic pregnancy and what to do if they experience any of these symptoms

Provide easy access to professional interpretation services when needed

Policies/Procedures

Ensure facilities follow ACOG's Optimizing Postpartum Care recommendations on when to see patients postpartum, which includes the following: "All women should ideally have contact with a maternal care provider within the first 3 weeks postpartum. This initial assessment should be followed up with ongoing care as needed, concluding with a comprehensive postpartum visit no later than 12 weeks after birth."

Middle and high schools should provide comprehensive sex education to all students

Medicaid should increase the reimbursement amounts for psychiatric services

Substance Use Disorder

Educate pregnant and postpartum patients with substance use disorder on the increased risk of overdose postpartum and when changing treatment, both at the time of discharge or at treatment change, and ensure connection to substance use treatment before, during, and after pregnancy

Policymakers should work with communities to increase access to substance use treatment in areas with low access across the state

Identify and offer multiple treatment options for dealing with ongoing postpartum pain for patients with substance use disorder.

Ensure coordination between methadone clinics and obstetric providers when needed

Communities should support family residential centers for substance use treatment that include wrap-around services for the entire family

About the Wisconsin MMR Program

The Wisconsin Maternal Mortality Review Team has reviewed pregnancy-associated deaths in some capacity since as early as the 1950s. Until recently, the MMR program was supported part time by staff from other public health programs at the Wisconsin Department of Health Services.

In 2019, Wisconsin received funding from the Centers for Disease Control and Prevention through the Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) Program, which allowed the MMR program to hire three full-time staff dedicated to this work in late 2020. This increased capacity has led to a significant increase in the number of cases reviewed per year, as well as increased opportunities for dissemination and implementation of the MMRT's recommendations.

The MMRT is composed of public health and health care experts who represent professional organizations involved in the delivery of health care to pregnant people in Wisconsin. The MMRT strives to include representation from multiple disciplines, including public health services, perinatal nursing, midwifery, psychiatry, and obstetrics.

Maternal Mortality Review Team Members

The Wisconsin Department of Health Services would like to thank the following partners for their contributions to the Maternal Mortality Review Team:

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Additional Information

To learn more about the Wisconsin Maternal Mortality program, please visit the Wisconsin Maternal Mortality and Morbidity website.

To learn more about national efforts to prevent maternal mortality, please visit ERASE MM's Review to Action website.

Appendix: 2011–2015 Cases

The MMRT's procedures have changed in recent years. Prior to 2016 deaths, the MMRT did not review cases with causes of death that are less obviously connected with pregnancy (see Table 1). The MMRT reviewed 97 deaths that occurred between 2011 and 2015, approximately 75% of the total confirmed pregnancy-associated deaths from that time period (131). The 34 pregnancy-associated deaths that were not reviewed did not meet the MMRT's criteria at the time, and would all qualify for review under the MMRT's current criteria and procedures.

Due to this criteria change, the number of 2011–2015 pregnancy-related deaths cannot be compared to later years. However, these numbers can be compared to earlier years, which used similar review methods. Please see Table 2 for an overview of pregnancy-related deaths in 2011–2015 compared to 2006–2010.

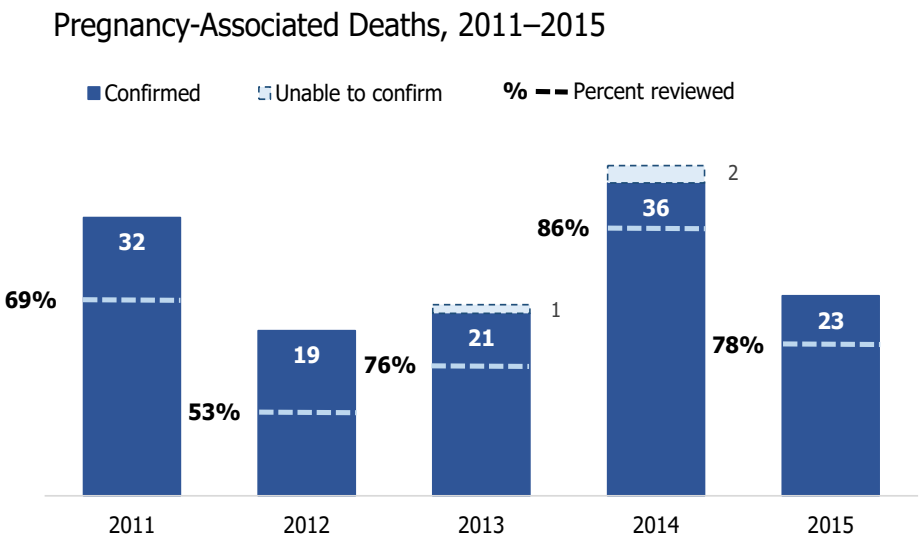

Table 1 Pregnancy-Associated Deaths by Relatedness and Reason for Case Exclusion, Wisconsin, 2011–2015

Total Reviewed Cases	**97**
Pregnancy-related	24
Possibly pregnancy-related*	20
Pregnancy-associated but not related	52
Unable to determine	1
Total Cases Excluded From Review	**34**
Motor vehicle crash	12
Suicide	7
Homicide	4
Insufficient information	4
Accidental overdose	4
Cancer	3
Total Pregnancy-Associated Deaths (Reviewed + Excluded)	**131**

*Possibly pregnancy-related was an option only in reviews of deaths before 2016.

Table 2 Pregnancy-Related Mortality Ratio (PRMR) per 100,000 live births by Maternal Demographics, Wisconsin, 2011–2015 and 2006–2010

	2011–2015 Pregnancy-related deaths				2006–2010 Pregnancy-related deaths			
	Number of deaths	Number of live births	PRMR	95% CI	Number of deaths	Number of live births	PRMR	95% CI
Age								
15–19	2	18763	-	-	4	29518	-	-
20–24	7	68473	10.2	4.1–21.0	4	81870	-	-
25–29	3	106020	-	-	4	111108	-	-
30–34	2	96578	-	-	3	87087	-	-
35–39	7	37933	18.5	7.4–38.1	5	38359	13	4.2–30.3
40+	3	7680	-	-	1	8217	-	-
Education								
<12 years	4	40190	-	-	5	51706	9.7	3.2–22.6
12 years	10	82493	12.1	5.8–22.25	10	99116	10.1	4.8–18.6
>12 years	10	211496	4.7	1.6–7.5	6	203141	3	1.1–6.5
Marital status								
Married	16	210175	7.6	4.0–11.7	5	226889	2.2	.7–5.1
Unmarried	8	123448	6.5	2.8–12.8	16	129217	12.4*	7.1–20.1
Race/ethnicity								
White¥	16	244880	6.5	3.7–10.6	12	265955	4.5	2.3–7.7
Black¥	5	31827	15.7	5.1–36.6	8	35612	22.5*	9.7–44.3
Hispanic	2	32488	-	-	1	34283	-	-
American Indian/ Alaska Native¥	1	3730	-	-	0	5749	0	0.0–0.0
Laotian/Hmong¥	0	7792	0	0.0–0.0	0	6531	0	0.0–0.0
Other¥	0	8361	0	0.0–0.0	0	7907	0	0.0–0.0
Smoking status								
Smoker	7	45087	15.5	6.2–31.9	9	50725	17.7*	8.1–33.6
Nonsmoker	17	288921	5.9	3.4–9.5	12	304181	3.9	2.0–6.8
Total	**24**	**335659**	**7.2**	**4.6–10.7**	**21**	**356252**	**5.9**	**3.7–9.0**

* Statistically significant difference compared to the first population listed in the category (e.g. 15–19, <12 years, etc.)

- Insufficient data to calculate rate; rates are calculated when the number of deaths is greater than four

¥ Non–Hispanic

Note about the data: Ratios with fewer than eight deaths may be unstable. 2006–2010 data were originally reported in the Wisconsin Medical Journal in 2015. Due to changes in data suppression methods, mortality ratios may have been calculated in 2015 that no longer meet current standards.