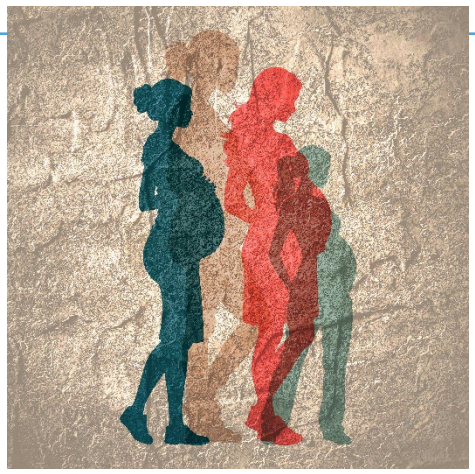
2026

Pennsylvania Maternal Mortality Review Annual Report

Data on Deaths that Occurred in 2022



DIVISION OF MATERNAL HEALTH SERVICES

BUREAU OF FAMILY HEALTH

Pennsylvania
Department of Health

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Dedication

We dedicate this report to the memory of the 122 individuals who died, with deepest sympathy for their loved ones.

We hope that our efforts to understand the causes and contributing factors of these deaths will prevent future deaths in Pennsylvania.

Acknowledgements

The Department of Health expresses its gratitude to the members of the Pennsylvania and Philadelphia Maternal Mortality Review Committees for their diligent work to improve the health of perinatal individuals in Pennsylvania.

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Declaration

The language in this document is intended to be universal and inclusive, by focusing on the individual and not labeling gender.

The Pennsylvania and Philadelphia Maternal Mortality Review Committees avoid victim-blaming. An individual is not to blame for their own death. There are many factors that influence the overall health of individuals including access to high-quality care, safe and supportive communities, and comprehensive education about health and pregnancy.

Definitions

Accidental death is a death that occurs as the result of an injury or poisoning with no intent to harm or cause death.

Adverse childhood experiences (ACEs) are potentially traumatic events that occur during childhood, significantly impacting health and wellbeing throughout life.

Behavioral health refers to mental health and substance use disorder, life stressors and crises, and stress-related physical symptoms.

Intimate Partner Violence (IPV) is a pattern of coercive behaviors used by a current or former intimate partner to gain power and control over another person.

Natural death is a death that occurs solely because of a disease, condition, or aging process, and is not related to an injury or external event.

Perinatal is the period of time from the beginning of pregnancy to one year after the end of the pregnancy.

Pregnancy-associated death is the death of an individual while pregnant or up to one year from the end of a pregnancy regardless of the outcome, duration, or site of the pregnancy. These deaths include pregnancy-related deaths and pregnancy-associated but not related deaths.

Pregnancy-related death is the death of an individual while pregnant or within one year of the end of a pregnancy from a pregnancy complication, a chain of events initiated by the pregnancy, or the aggravation of an unrelated condition from the physiological changes of pregnancy. Pregnancy-related deaths may happen because the pregnancy causes a new medical (including mental) health problem, starts a chain of events that lead to death, or makes an unrelated condition worse. Deaths are pregnancy-related if the person's death would not have occurred at that time if the individual had not been pregnant.

Pregnancy-associated but not related death is the death of an individual while pregnant or within one year of the end of pregnancy from any cause that is not related to pregnancy. This can include a cause of death such as a car accident.

Pregnancy-associated but unable to determine relatedness death is the death of an individual while pregnant or within one year of the end of pregnancy from any cause, where there is not enough evidence available on the death to determine if the death was pregnancy-related or pregnancy-associated but not related. An example of a pregnancy-associated but unable to determine relatedness death would be a

pregnancy-associated death from suicide where there were no records available to determine if the death was related to or aggravated by pregnancy or its management.

Pregnancy-related mortality ratio (PRMR) is the number of pregnancy-related deaths per 100,000 live births. It is a ratio, rather than a rate, because the denominator contains only live births and not all pregnancies regardless of outcome, duration, or site.

Preventability means there is at least some chance of the death being prevented by one or more reasonable changes to the patient, family, provider, facility, system, and/or community factors.

Severe Maternal Morbidity is the unexpected outcomes of labor and delivery that result in significant short-term or long-term consequences to a perinatal individual's health.

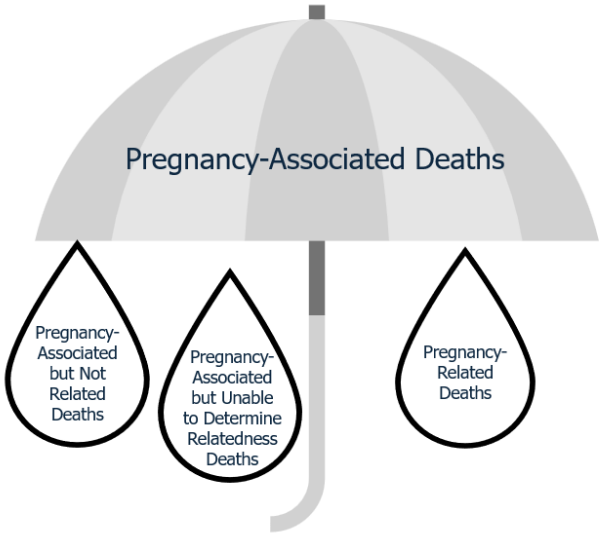
Table of Abbreviations

ACOG	American College of Obstetricians and Gynecologists
BHSR	Pennsylvania Bureau of Health Statistics and Registries
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare and Medicaid Services
CYS	Pennsylvania Children and Youth Services
DHS	Pennsylvania Department of Human Services
DOH	Pennsylvania Department of Health
ED	Emergency Department
ERASE MM	Enhancing Reviews and Surveillance to Eliminate Maternal Mortality
IPV	Intimate Partner Violence
LARC	Long-Acting Reversible Contraception
MFM	Maternal-Fetal Medicine
MMRC	Maternal Mortality Review Committee
MMRIA	Maternal Mortality Review Information Application
MMRP	Maternal Mortality Review Program
OBGYN	Obstetrician-Gynecologists
PA PQC	Pennsylvania Perinatal Quality Collaborative
PA-NEDSS	Pennsylvania National Electronic Disease Surveillance System
PCP	Primary Care Provider
PDMP	Prescription Drug Monitoring Program
PRMR	Pregnancy-Related Mortality Ratio
SUD	Substance Use Disorder
WIC	Pennsylvania Special Supplemental Nutrition Program for Women, Infants, and Children

Executive Summary

The death of a perinatal individual, or an individual who is in the period from the beginning of pregnancy to one year after the end of pregnancy, is an indicator of a broader community's health, and underscores ongoing public health issues. Act 24 of 2018 established the Pennsylvania Maternal Mortality Review Committee (PA MMRC) to review pregnancy-associated deaths and create actionable recommendations to prevent future deaths and improve perinatal health.

The PA MMRC reviews pregnancy-associated deaths for all counties except Philadelphia. Philadelphia County accounts for approximately 20% of all pregnancy-associated deaths in Pennsylvania and has had an active MMRC since 2010. PA MMRC and Philadelphia MMRC data are combined in this report to understand the collective impact on the death of perinatal individuals in the Commonwealth.



As depicted in the graphic, pregnancy-associated deaths encompass all deaths of individuals while pregnant or up to one year after the end of pregnancy, regardless of the outcome, duration, or site of the pregnancy. After the review of a case, the MMRCs determine whether the death was pregnancy-associated but not related, pregnancy-associated but unable to determine relatedness, or pregnancy-related. A pregnancy-related death is the death of an individual while pregnant or within one year of the end of the pregnancy, regardless of the outcome, duration, or site of the pregnancy, that resulted from a complication of pregnancy or the aggravation of an unrelated condition from the physiological changes of pregnancy.

Understanding the factors that contribute to pregnancy-related deaths is a first step in providing reasonable interventions for death prevention. In total, the MMRCs made nearly 300 recommendations for the deaths in 2022. The recommendations are summarized in this report and identify prevention opportunities grouped by priorities that mirror Pennsylvania's first-ever Maternal Health Strategic Action Plan, which was released in March 2026. The plan is a collaborative effort by the Pennsylvania Department of Human Services (DHS), Pennsylvania Department of Health (DOH), Pennsylvania Insurance Department (PID), and the Pennsylvania Department of Drug and Alcohol Programs (DDAP), together with the Governor's Advisory Commission on

Women and Pennsylvania's General Assembly. The priority areas of focus are 1) Improving Access to High-Quality Care, 2) Addressing Community Factors that Impact Health Outcomes, 3) Improving Rural Health and Maternity Care Deserts, 4) Supporting Behavioral Health and Substance Use Disorder Needs, and 5) Expanding and Diversifying the Maternal Health Workforce.

Key Findings:

- Of the 122 identified cases of pregnancy-associated death, 53 (43.4%) were deemed pregnancy-related and 52 (42.6%) were deemed pregnancy-associated but not related.
- There were 27 deaths that occurred 42 days or less from the end of pregnancy, which had a pregnancy-related mortality ratio (PRMR) of 20.1 per 100,000 live births. This is less than the national rate for 2022[1] (22.3/100,000).
- Among pregnancy-related deaths, 49% were related to mental health conditions.
- Within mental health conditions, overdose and substance use disorder (SUD) are the primary causes of death (69%) which were the primary cause of death since the inception of this report.
- Approximately 41% of pregnancy-related deaths had SUD identified as a contributing factor to the death.
- Perinatal individuals over the age of 35 accounted for 34% of pregnancy-related deaths, while individuals under age 25 accounted for 17%.
- Among pregnancy-related deaths, about half (49%) occurred 43 days to one year after the end of pregnancy, and 17% while the individual was pregnant.
- More than 35% of individuals with a cause of death of mental health conditions died 43 days to one year post delivery.
- Natural manners of death occurred more often in those who were either pregnant at time of death or pregnant within 42 days of death.

Purpose/Background

Program Overview

The death of a perinatal individual has profound effects on a community. It is the loss of a family member, friend, and member of the community. These deaths reflect the quality of the health care system and all systems within a community.

> Circumstances surrounding pregnancy-related death highlight problems in community resources and health care provided to all individuals in a community.

The goal of an MMRC is to close gaps in the physical, mental, and social health systems before, during, and after pregnancy by identifying disparities and creating actionable recommendations. MMRCs include both nonclinical and clinical professionals and community members who represent diverse fields related to health and wellness during pregnancy and/or have lived experiences that contribute to the group's understanding of individuals' experiences on perinatal health and wellness. MMRC members are from backgrounds including maternal fetal medicine (MFM), obstetrics/gynecology (OBGYN), midwifery, nursing, psychiatry, addiction medicine, emergency medicine, family medicine, anesthesiology, community health, social work, violence prevention, health statistics, death investigation, government agencies such as the DOH and DHS, and other specialties as needs are identified.

Details on the case review process are included in the Appendix: Methods section below. Of the 122 perinatal deaths in 2022, 29 were reviewed by the Philadelphia MMRC, 76 by the PA MMRC, and 17 internally by the PA MMRC vice chairs.

This report, which is legislatively mandated to be published by the PA MMRC annually since 2023, aims to improve access to timely data. The report summarizes recommendations made by the MMRCs to advance the care of perinatal individuals. The DOH also publishes an annual report on Severe Maternal Morbidity. Severe Maternal Morbidity is the unexpected outcomes of labor and delivery that result in significant short-term or long-term consequences to a perinatal individual's health.[2]

The DOH received funding and technical assistance since 2019 from the Centers for Disease Control and Prevention's (CDC) Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) grant to support activities related to the PA and Philadelphia MMRCs. Additional funding for program activities is provided by the Health Resources and Services Administration's Title V Maternal and Child Health Services Block Grant and state funding.

Findings

Pregnancy-Associated Deaths

Pregnancy-associated deaths are the deaths of individuals while pregnant or up to one year from the end of a pregnancy regardless of the outcome, duration, or site of the pregnancy[3] and include deaths determined to be pregnancy-related, pregnancy-associated but not related, and pregnancy-associated but unable to determine relatedness. The leading cause of death among pregnancy-associated deaths in 2022 is mental health conditions, making up almost 42% of deaths. Within mental health conditions, overdose and SUD are the primary causes of death (84%). When combined with injury, which encompasses accidental deaths and homicides, these two causes of death categories make up about 60% of all pregnancy-associated deaths **(Table 1: Categories of Leading Causes of Death for 2022 Pregnancy-Associated Deaths in Pennsylvania (n=122))**.

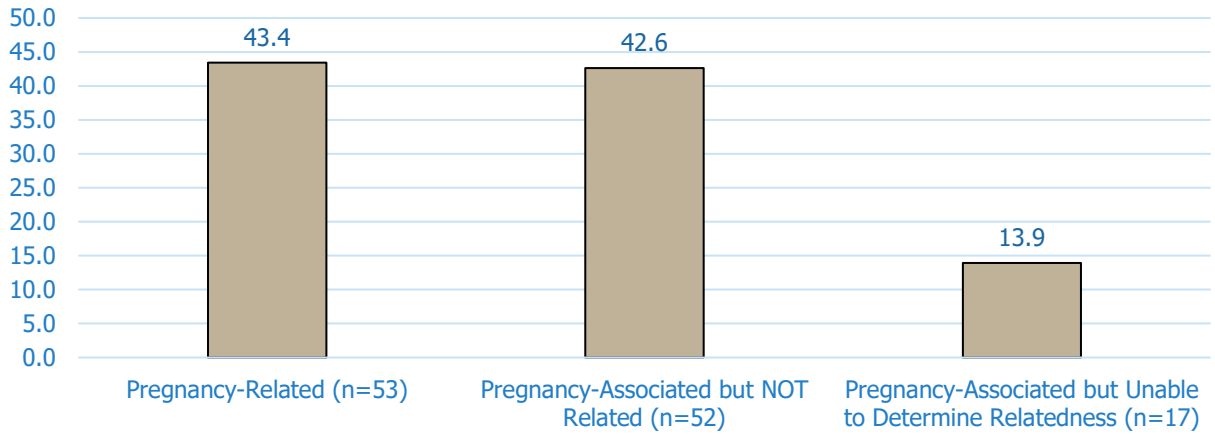
Table 1: Categories of Leading Causes of Death for 2022 Pregnancy-Associated Deaths in Pennsylvania (n=122)

Category	n	%
Mental health conditions*	51	41.8
Injury	23	18.9
Cardiac and coronary conditions	16	13.1
Infection	7	5.7
Embolism	6	4.9
Cerebrovascular accident	5	4.1
Cancer	4	3.3
Hemorrhage	4	3.3
Pulmonary conditions	3	2.5
Metabolic/endocrine conditions	2	1.6
Undetermined	1	0.8

**Within this category are substance use disorder, suicide, and other mental health disorders.*

When reviewing deaths in 2022, the MMRCs determined 53 were pregnancy-related (43.4%) and 52 pregnancy-associated but not related (42.6%). The committees were unable to determine pregnancy-relatedness in 17 (13.9%) of the deaths **(Figure 1: Percentage of Pregnancy-Relatedness Among All Pregnancy-Associated Deaths in Pennsylvania, 2022 (n=122))**. Often the reason for the inability to determine pregnancy-relatedness is due to a lack of information; for example, records do not exist because the individual was not in treatment or under the care of a provider, records were not received when requested, or pertinent information was not documented in the available records.

Figure 1: Percentage of Pregnancy-Relatedness Among All Pregnancy-Associated Deaths in Pennsylvania, 2022 (n=122)

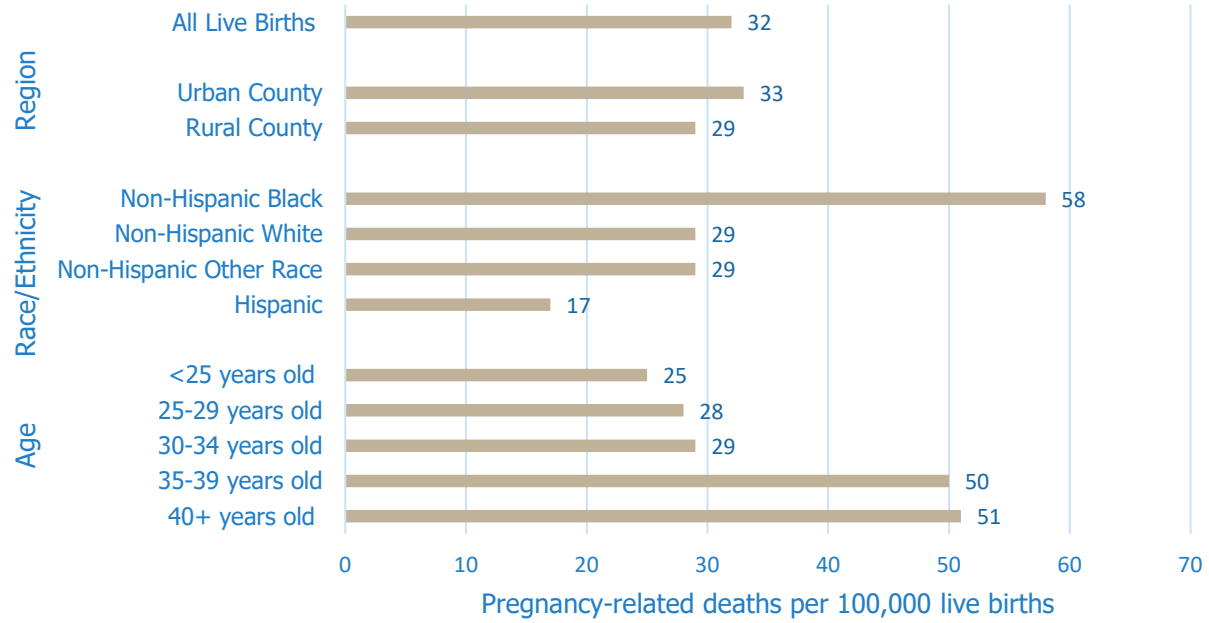


Pregnancy-Related Deaths

Pregnancy-related mortality ratios (PRMR) estimate the number of pregnancy-related deaths per 100,000 live births and are used to compare the risk of pregnancy-related death across populations. The graph below shows the PRMR for Pennsylvania from 2020-2022. The highest risk group are individuals giving birth who are non-Hispanic Black (58 per 100,000); they are at two times greater risk of pregnancy-related death than non-Hispanic white individuals giving birth **(Figure 2: Pregnancy-Related Mortality Ratio by Demographics, Pennsylvania 2020-2022)**. This graph also depicts these ratios by regional status. The PRMR for individuals who resided in rural counties is 29 deaths per 100,000 live births. The rural county PRMR must be interpreted cautiously however, due to the low case counts in Pennsylvania over these three years. The overall PRMR for this period is 32 per 100,000 live births. Recommendations from the MMRCs are intended to decrease these ratios in the future.

Pregnancy-related deaths are the deaths of individuals while pregnant or within one year of the end of pregnancy, regardless of the outcome of the pregnancy, duration, or site of the pregnancy, which result from complications of pregnancy or the aggravation of an unrelated condition from the physiological changes of pregnancy.

Figure 2: Pregnancy-Related Mortality Ratio (PRMR) by Demographics, Pennsylvania 2020-2022



Much like previous report findings, in 2022, mental health conditions, which include drug-related overdose deaths and suicides, are the leading cause of pregnancy-related deaths, demonstrating the continuing need for more behavioral health care services for perinatal individuals. Mental health conditions make up about 49% of deaths. Within mental health conditions, overdose and SUD are the primary causes of death (69%). Other top causes of pregnancy-related death were cardiac and coronary conditions (which includes cardiomyopathy) and infection, in total making up 71.6% of pregnancy-related deaths **(Table 2: Categories of Leading Causes of Death for 2022 Pregnancy-Related Deaths in Pennsylvania (n=53))**.

Table 2: Categories of Leading Causes of Death for 2022 Pregnancy-Related Deaths in Pennsylvania (n=53)

Category	n	%
Mental health conditions*	26	49
Cardiac and coronary conditions	7	13.2
Infection	5	9.4
Embolism	4	7.5
Injury	3	5.7
Hemorrhage	3	5.7
Cerebrovascular accident	2	3.8
Pulmonary conditions	2	3.8
Cancer	1	1.9

**Within this category are substance use disorder, suicide, and other mental health disorders.*

When examined by race, the leading causes of pregnancy-related death for white individuals were mental health conditions and infection, while for Black individuals they were mental health conditions and cardiac and coronary conditions, highlighting differing experiences among racial groups **(Table 3: Percentage of Leading Causes**

of Death for 2022 Pregnancy-Related Deaths in Pennsylvania by Race (n=53)).

Table 3: Percentage of Leading Causes of Death for 2022 Pregnancy-Related Deaths in Pennsylvania by Race (n=53)

Cause of Death	Race n, (%)					Ethnicity n, (%)
	White	Black or African American	Other Race	Multiracial	**Total**	Hispanic*
Mental health conditions	19, (35.8)	4, (7.5)	1, (1.9)	2, (3.8)	26, (49)	0, (0)
Cardiac and coronary conditions	3, (5.7)	3, (5.7)	1, (1.9)	0, (0)	7, (13.2)	3, (5.7)
Infection	5, (9.4)	0, (0)	0, (0)	0, (0)	5, (9.4)	0, (0)
Embolism	3, (5.7)	1, (1.9)	0, (0)	0, (0)	4, (7.5)	0, (0)
Injury	1, (1.9)	2, (3.8)	0, (0)	0, (0)	3, (5.7)	0, (0)
Hemorrhage	2, (3.8)	1, (1.9)	0, (0)	0, (0)	3, (5.7)	0, (0)
Cerebrovascular accident	2, (3.8)	0, (0)	0, (0)	0, (0)	2, (3.8)	0, (0)
Pulmonary conditions	1, (1.9)	0, (0)	1, (1.9)	0, (0)	2, (3.8)	1, (1.9)
Cancer	0, (0)	1, (1.9)	0, (0)	0, (0)	1, (1.9)	0, (0)
Total	36, (67.9)	12, (22.6)	3, (5.7)	2, (3.8)	53, (100)	---

**Hispanic ethnicity is independent of race. These percentages are not part of the total.*

When evaluating pregnancy-related death by age, most deaths (75.4%) occurred in individuals between ages 25 and 39 years. Due to rounding, the percentages are slightly under 100%, but all cases are accounted for in the graph **(Figure 3: Percentage of Age at Time of Death for 2022 Pregnancy-Related Deaths in Pennsylvania (n=53)).** These data can be compared to the percentages of reported pregnancies for Pennsylvania in 2022 **(Figure 4: Percentage of Reported Pregnancies in 2022 by Age, Pennsylvania).** When looking at reported pregnancies by age, most pregnancies occurred in individuals between 25 and 34 years old (58.7%). These data are similar when looking at 2022 deaths by age. Only 16% of pregnancies were reported in ages 35-39, but the percentage of deaths in that age group were higher at 26.4%.

Figure 3: Percentage of Age at Time of Death for 2022 Pregnancy-Related Deaths in Pennsylvania (n=53)

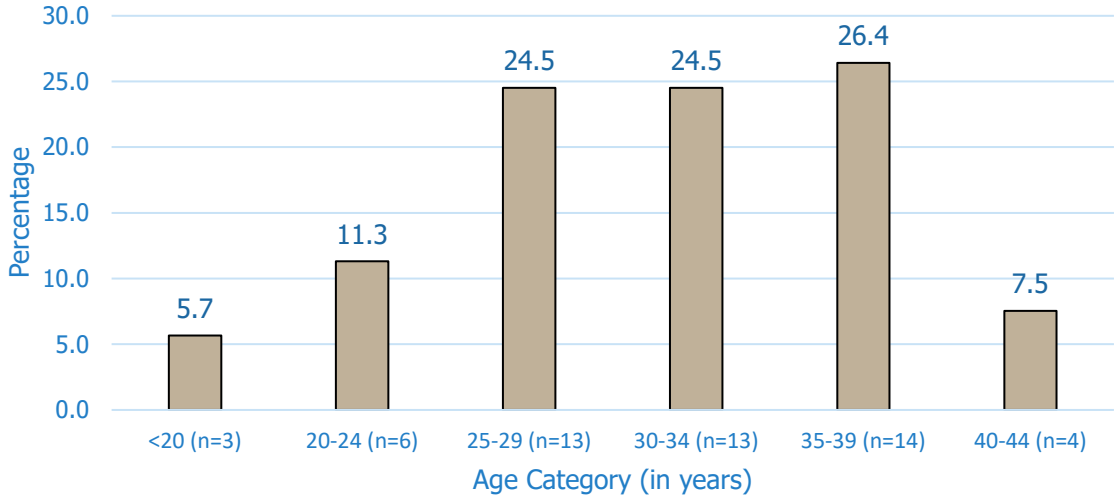
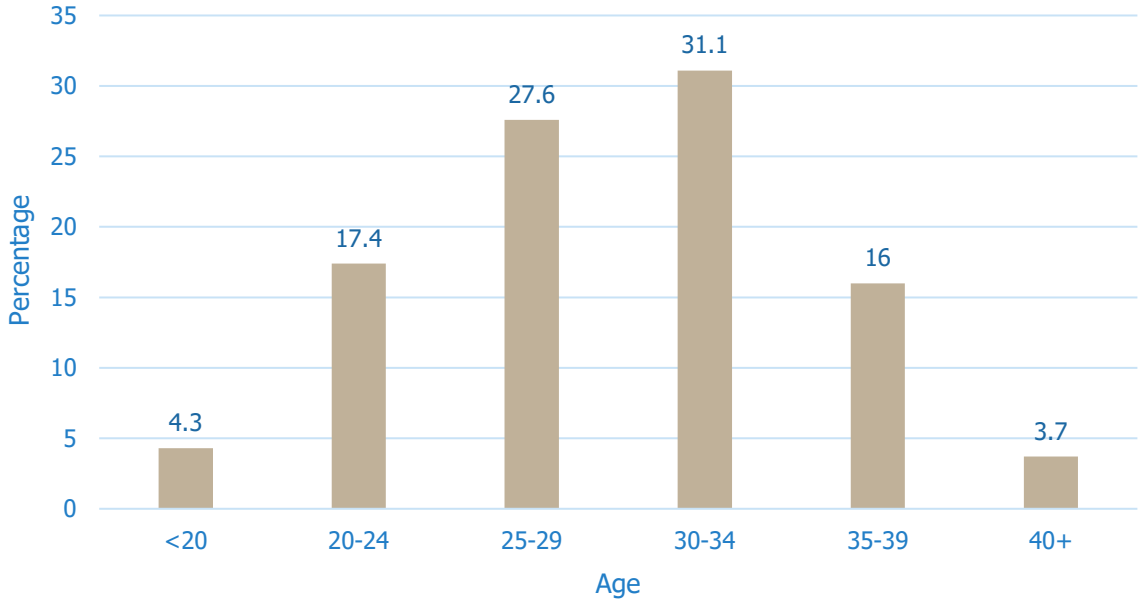
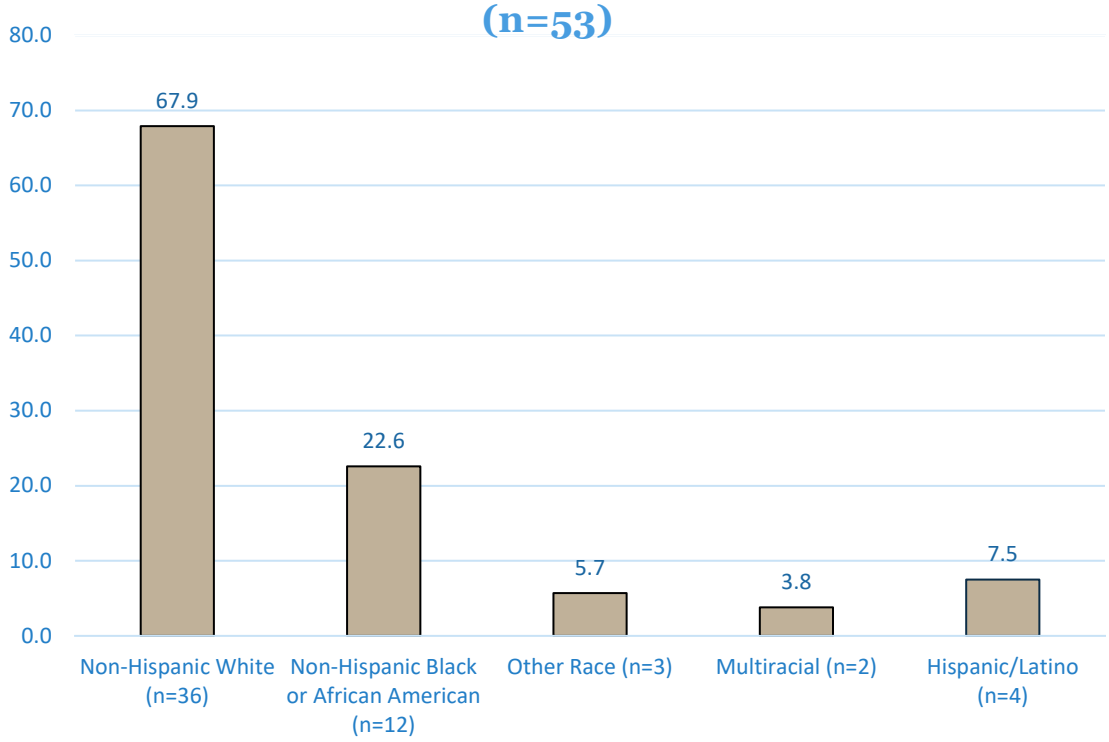


Figure 4: Percentage of Reported Pregnancies in 2022 by Age, Pennsylvania

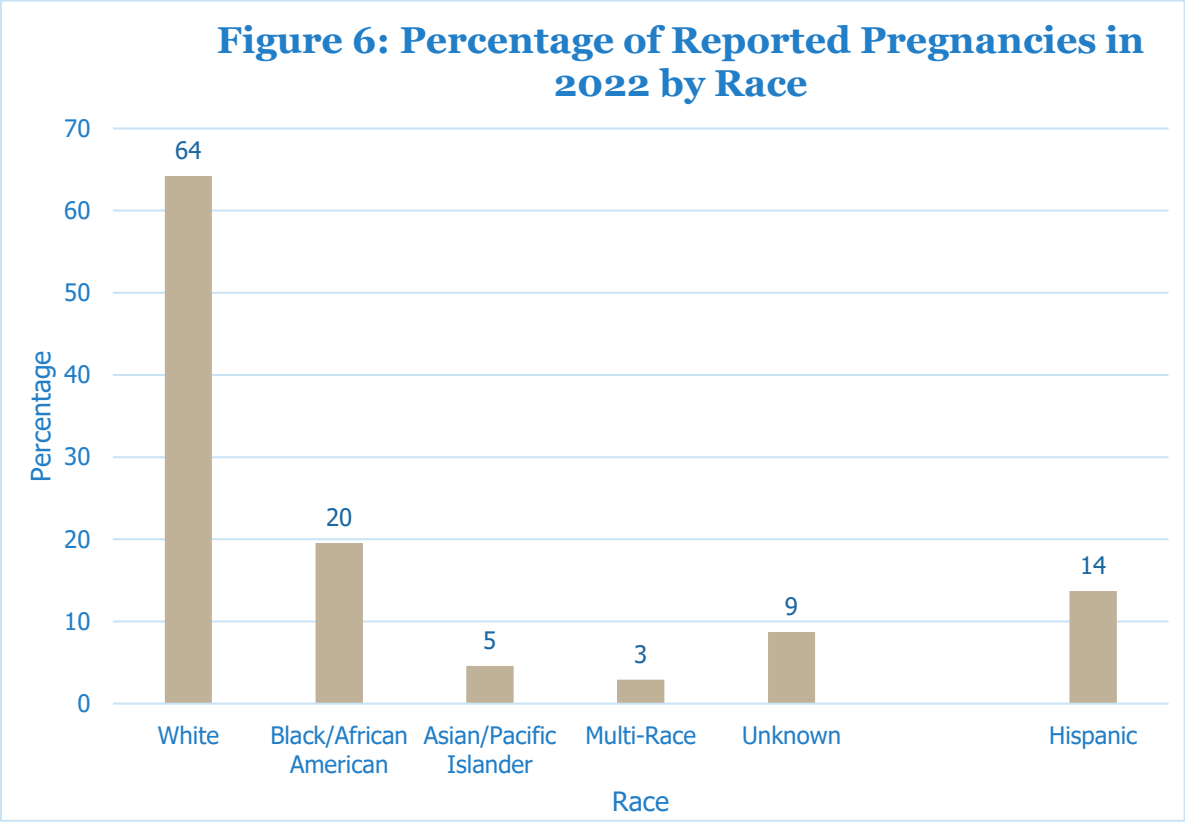


Of the 53 pregnancy-related deaths, 22.6% of individuals identified as non-Hispanic Black **(Figure 5: Percentage of Race and Ethnicity for 2022 Pregnancy-Related Deaths in Pennsylvania (n=53))** while 14% of live births in Pennsylvania were among non-Hispanic Black individuals.[4]

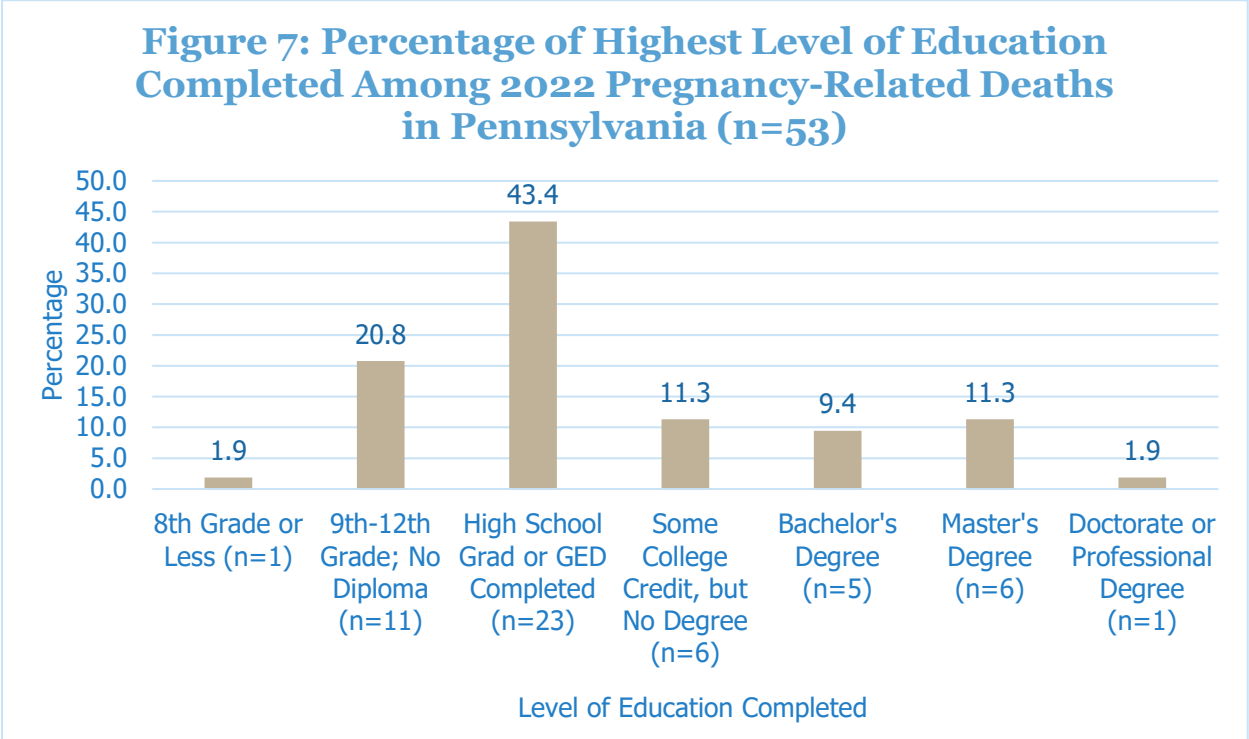
Figure 5: Percentage of Race and Ethnicity for 2022 Pregnancy-Related Deaths in Pennsylvania (n=53)



Most pregnancies occurred in white individuals (64%) and about 20% of pregnancies occurred in Black individuals. It is important to note that some individuals who identify as the ethnicity Hispanic are also included in their identified race, which is the reason the sum of these percentages does not equal 100% **(Figure 6: Percentage of Reported Pregnancies in 2022 by Race).**



Most of the individuals whose deaths were pregnancy-related completed high school or a GED (77.3%) with about 23% of individuals completing higher level education **(Figure 7: Percentage of Highest Level of Education Completed Among 2022 Pregnancy-Related Deaths in Pennsylvania (n=53))**.



For regional status, the majority of deaths occurred in individuals who resided in urban counties. The Center for Rural Pennsylvania classifies counties by regional status. When looking at regional status and causes of death, infection was more common among individuals from rural counties than from urban counties (5.7%). This could be due to a lack of access to quality care, transportation challenges, or other issues **(Table 4: Percentage of Leading Causes of Death for 2022 Pregnancy-Related Deaths in Pennsylvania by Regional Status (n=53)).**

Table 4: Percentage of Leading Causes of Death for 2022 Pregnancy-Related Deaths in Pennsylvania by Regional Status (n=53)

Cause of Death	Regional Status n, (%)		
	Rural	Urban	**Total**
Mental health conditions	5, (9.4)	21, (39.6)	26, (49)
Cardiac and coronary conditions	0, (0.0)	7, (13.2)	8, (15.1)
Infection	3, (5.7)	2, (3.8)	5, (9.4)
Embolism	0, (0.0)	4, (7.5)	4, (7.5)
Injury	0, (0.0)	3, (5.7)	3, (5.7)
Hemorrhage	0, (0.0)	3, (5.7)	3, (5.7)
Cerebrovascular accident	1, (1.9)	1, (1.9)	2, (3.8)
Pulmonary conditions	0, (0.0)	2, (3.8)	2, (3.8)
Cancer	0, (0.0)	1, (1.9)	1, (1.9)
Total	9, (17.0)	44, (83.0)	53, (100.0)

The graph below depicts the timing of death among all pregnancy-related deaths. More pregnancy-related deaths occurred 43 days to one year after pregnancy than at any other time in the perinatal period, highlighting the importance of consistent care for individuals throughout the perinatal period **(Figure 8: Percentage of Timing of Death Among Pregnancy-Related Deaths in Pennsylvania in 2022 (n=53))**.

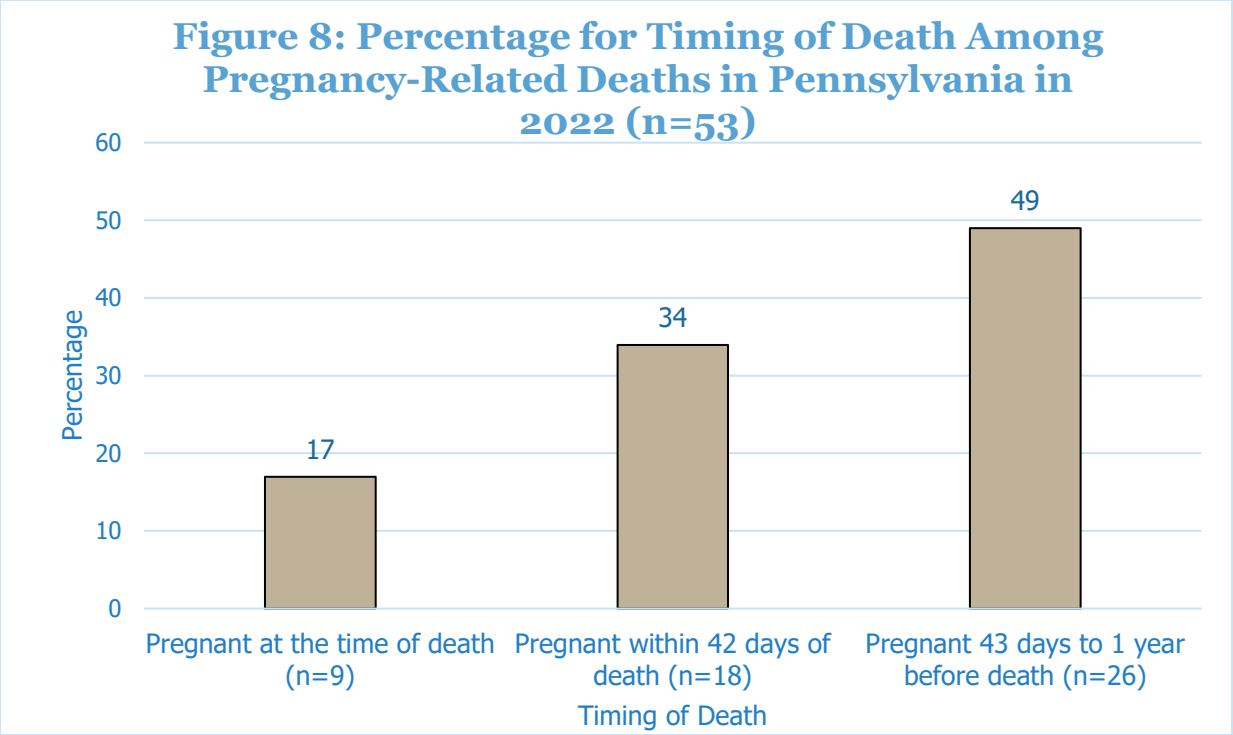
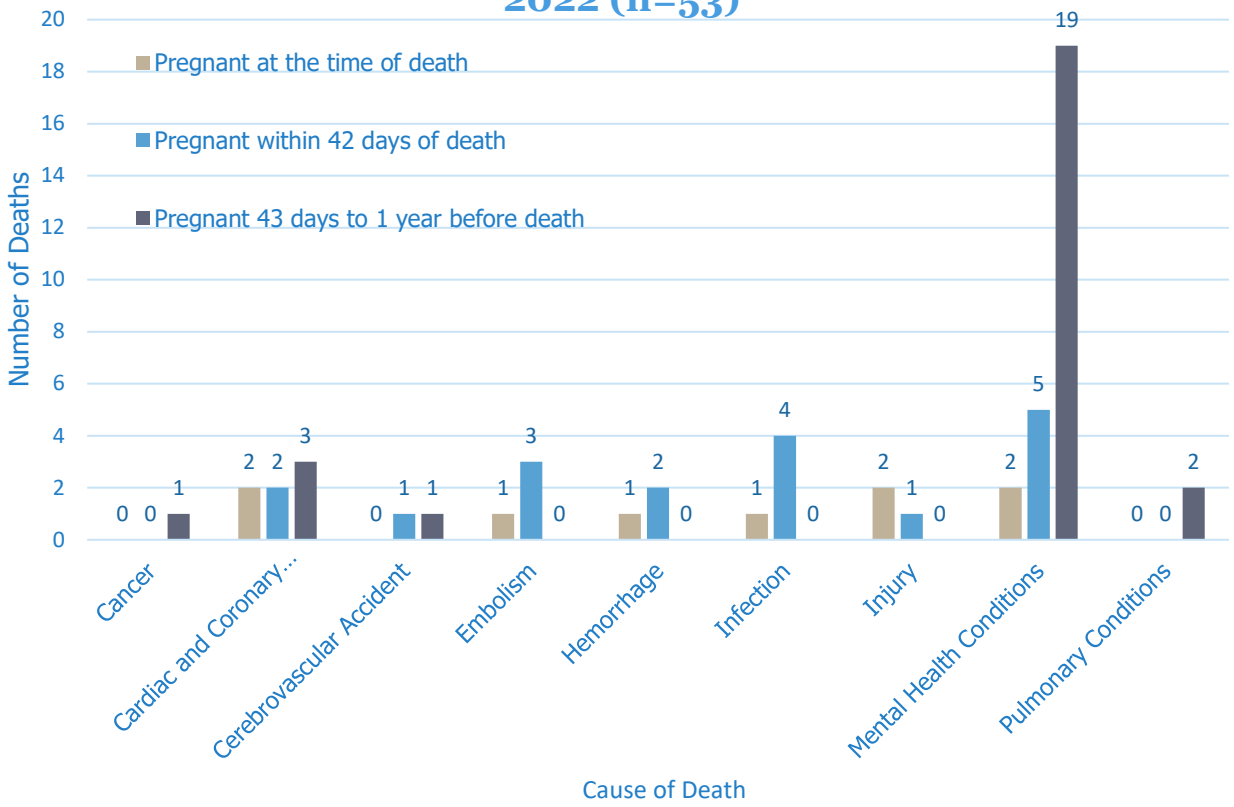


Figure 9 shows the timing of pregnancy-related deaths compared to the cause of death. Over 35% of those individuals with a cause of death of mental health conditions were pregnant 43 days to one year before their deaths. However, natural manners of death like embolism, infection, hemorrhage, and cardiac and coronary conditions occurred more often in those who were either pregnant at time of death or pregnant within 42 days of death **(Figure 9: Number of Deaths Comparing Timing of Death to Leading Cause of Death in Pennsylvania, 2022 (n=53)).**

Figure 9: Number of Deaths Comparing Timing of Death to Leading Cause of Death in Pennsylvania, 2022 (n=53)

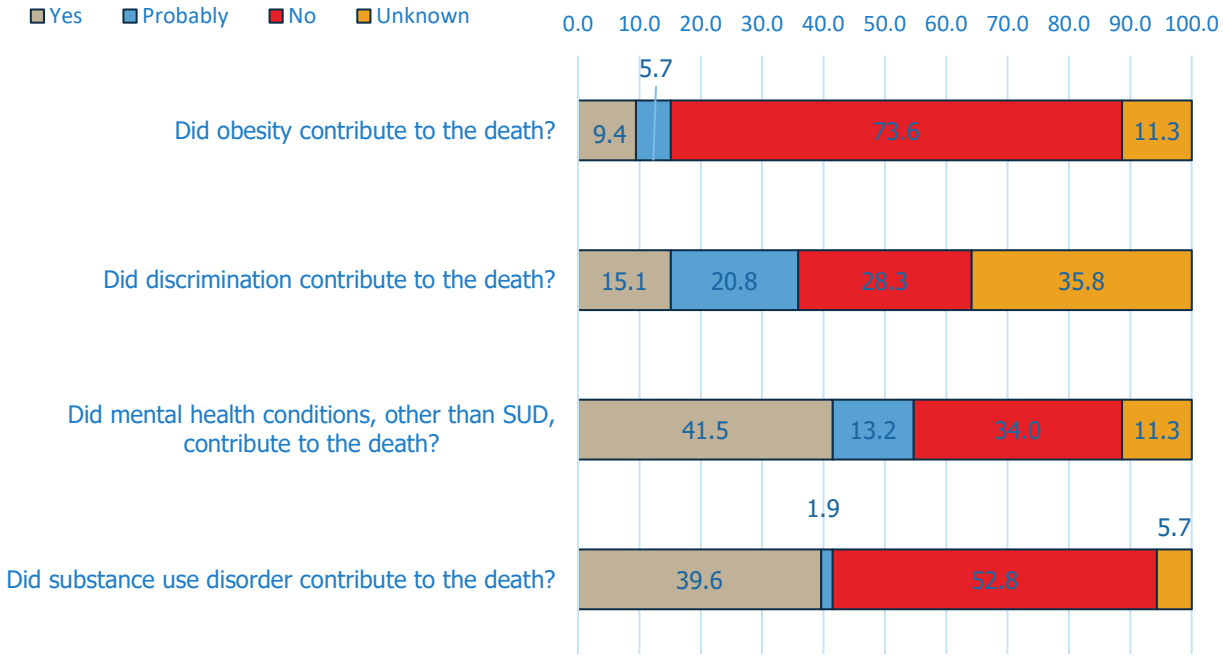


The MMRCs examined contributing circumstances to see which, if any, may have played a part in each death by answering four key questions, which are listed in Figure 8. The MMRCs found that 41.5% of deaths had a contributing factor of mental health conditions other than SUD while 39.6% had a contributing factor of SUD. These findings are consistent with mental health conditions being the leading cause of death among 2022 deaths **(Figure 10: Percentage of Committee Decisions on Circumstances Surrounding Pregnancy-Related Deaths for 2022 Cases Reviewed by the MMRCs (n=53))**.

Discrimination is treating someone less or more favorably based on the group, class, or category they belong to resulting from biases, prejudices, and stereotyping.[5] Discrimination can be identified in records in many ways, including through negative descriptors, diagnostic delays, and treatment decisions that are inconsistent with best practices. For example, individuals from certain racial or ethnic groups may have their symptoms minimized or documented using stigmatizing language, leading to delayed diagnoses or inadequate treatment. Similarly, individuals with a history of SUD may be labeled as "drug-seeking," resulting in restricted pain management, reduced access to

appropriate medications, or heightened scrutiny compared to individuals without such histories. Whether intentional or not, these choices may result in variations in the care provided and ultimately increase health disparities.

Figure 10: Percentage of Committee Decisions on Circumstances Surrounding Pregnancy-Related Deaths for 2022 Cases Reviewed by the MMRCs (n=53)



Circumstances surrounding the deaths can also be examined by the leading cause of death. As seen in Table 5, the leading cause of death, mental health conditions, can be separated into SUD and other mental health conditions; however, it is important to note that for each death, only one underlying cause of death is chosen, despite the complex relationship among SUD and other mental health conditions. By examining other contributing factors of each death, the MMRCs help to create a more complete picture of the circumstances surrounding each death. If the MMRCs answered "yes" or "probably" to whether SUD or other mental health conditions contributed to the death, they were combined as contributing to the death for this table. One hundred percent of deaths with SUD as the leading cause of death also had other mental health conditions contribute to the death. Because individuals with SUD often have other co-occurring mental health conditions, it is crucial that individuals are treated for all mental health conditions **(Table 5: Percentage of Committee Decisions on Substance Use**

Disorder and Other Mental Health Conditions by Leading Cause of Death, 2022).

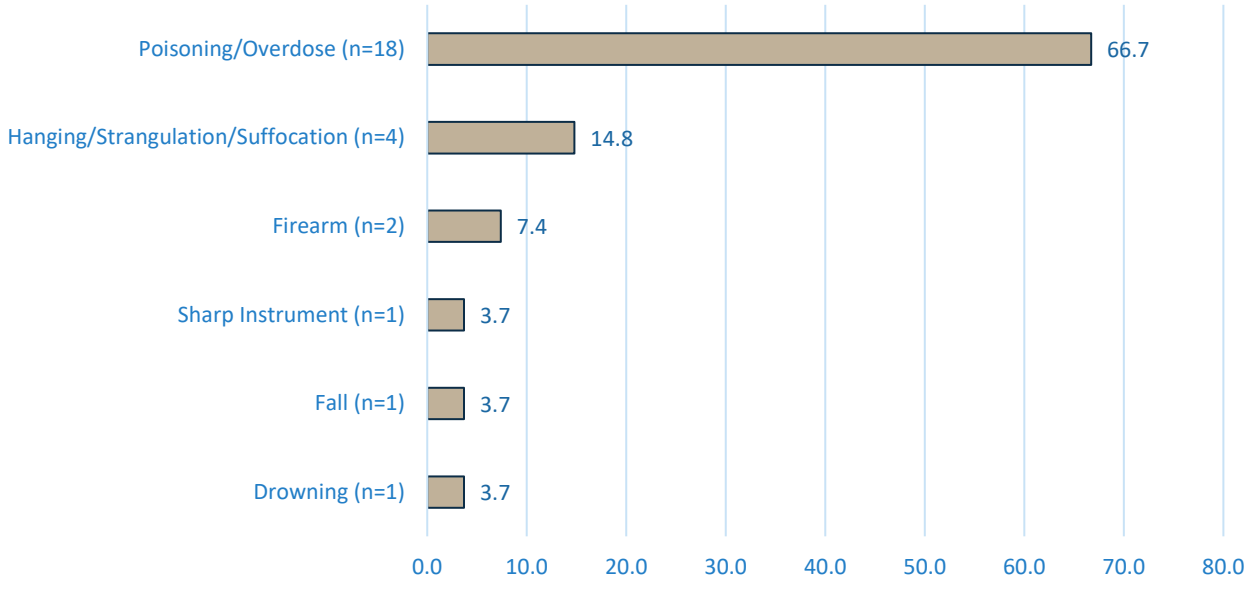
Table 5: Percentage of Committee Decisions on Substance Use Disorder and Other Mental Health Conditions by Leading Cause of Death, 2022

Cause of Death	Did SUD contribute to the death?*	Did mental health conditions other than SUD contribute to the death?*
All mental health conditions (n=26)	77	96
SUD (n=18)	--	100
Other mental health conditions (n=8)	38	--

**Responses to these questions include both "yes" and "probably".*

When reviewing a case, the MMRCs examined means of fatal injury in cases where the death was not classified as a natural death. The graph below shows the means of fatal injury for all pregnancy-related deaths in 2022 **(Figure 11: Percentage of Means of Fatal Injury for 2022 Pregnancy-Related Deaths in Pennsylvania (n=27)).** Deaths included in this graph include homicides, suicides, and accidental deaths. The highest means of fatal injury was poisoning/overdose, which included all deaths from SUD (66.7%). Hanging/strangulation/suffocation was the next highest at 14.8%.

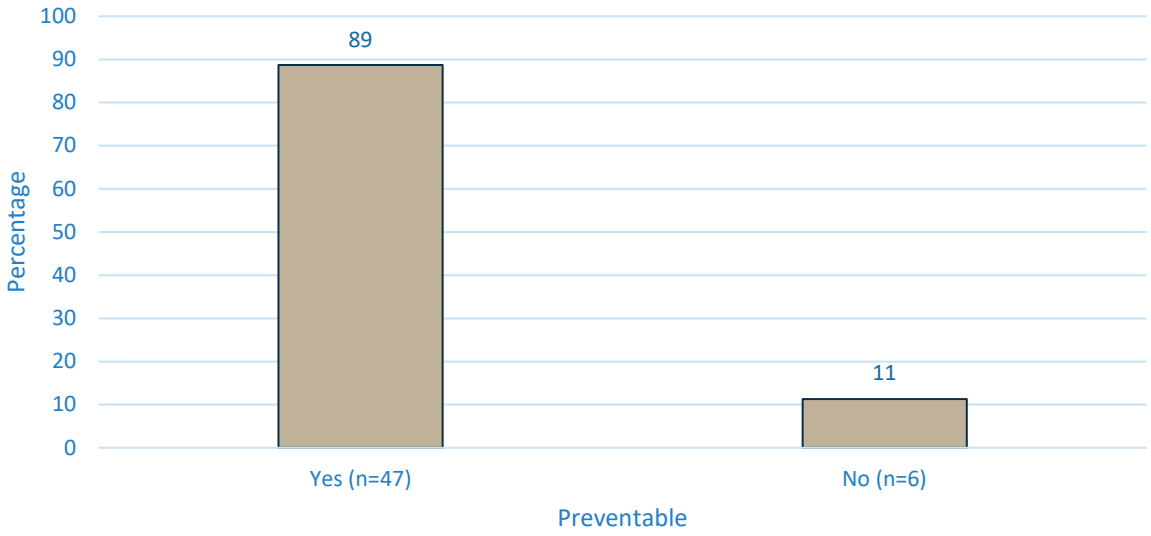
Figure 11: Percentage of Means of Fatal Injury for 2022 Pregancy-Related Deaths in Pennsylvania (n=27)



The committees also made determinations on the preventability of the deaths. Deaths are considered preventable if there was at least some chance of the death being avoided by one or more reasonable changes to patient, family, provider, facility, system, and/or community factors. This is determined by reviewing the circumstances of each death and evaluating contributing factors. Contributing factors can include lack of access to healthcare, transportation or childcare, inability to manage chronic conditions, a knowledge gap by the provider or patient, and many other factors that impact an individual's health. Of the 53 deaths that were pregnancy-related, the committees classified 47 (89%) as preventable **(Figure 12: Percentage of Preventability Among 2022 Pregnancy-Related Deaths in Pennsylvania (n=53))**. It is also important to note that the members of the committees represent many, but not all professions that have expertise to determine preventability of deaths; however, committee members use their expertise when determining preventability.

Preventability does not indicate that an individual or provider made a mistake to cause a death but that improvements can be made to prevent similar deaths in the future.

Figure 12: Percentage of Preventability Among 2022 Pregnancy-Related Deaths in Pennsylvania (n=53)



Important Note About These Data

Although these data provided by the Pennsylvania Department of Health are considered final, it still shows a snapshot of data at a specific point in time.

The Department specifically disclaims responsibility for any analyses, interpretations, or conclusions made by the user of this data product. If you have questions about these data or how to use them, please contact the PA MMRC at ra-dhmmrc@pa.gov.

Recommendations

Introduction

The Philadelphia and PA MMRCs formulate actionable recommendations after the review of each case, which aim to prevent future deaths when similar circumstances are involved. After reviewing the 53 deaths that were deemed pregnancy-related, the MMRCs made a total of nearly 300 recommendations. For this report, recommendations were sorted by priority area and summarized by most frequently occurring themes.

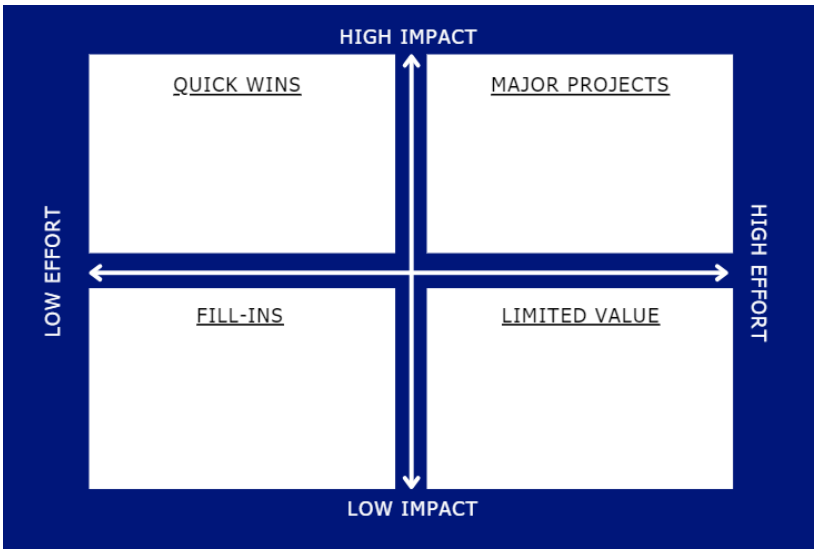
Members of the MMRCs made the recommendations that follow, based on the details of each 2022 death. The MMRCs identify problems and offer solutions. Publication of these recommendations should not be interpreted as endorsement by DOH or the entities to which the recommendations are directed; however, the MMRCs advocate for consideration and implementation of these actions to save lives.

Implementing Recommendations

The recommendations are summarized in this report to provide strategies for clinicians, social service providers, community members, policymakers, and all others working with perinatal individuals. Individuals reviewing these recommendations must decide if action is needed to improve services for the perinatal population in their work, facility, organization, or community. Individuals should ask:

- Does my work/facility/organization/community need to make this change?
  - What is working? What barriers exist? What do the data show?
- Who is needed to implement the action?
  - What is needed to gain buy-in? Who needs to be involved in the action?
- What will success look like?
  - How can the goal be: Specific, Measurable, Actionable/Achievable, Relevant, Time-Bound, Inclusive, and Equitable (SMARTIE)? Can the goal be broken down further into more manageable goals?
- What's the first step?

One tool which may help to prioritize actions is an action priority matrix. Selected recommendations should be plotted in one of the four boxes, which then highlights if the action is high impact and low effort, high impact and high effort, low impact and low effort, or high effort and low impact. There is no single correct answer on how to prioritize recommendations, as it depends on what is happening now, the data, and readiness for change.



We ask that entities implementing MMRC recommendations contact the MMRP by emailing the resource account, ra-dhmmrc@pa.gov. Informing the MMRP when MMRC recommendations are implemented will help assess the impact of this report and the maternal health initiatives occurring across Pennsylvania.

Priority Areas and Implementing Groups

In an effort to align perinatal health initiatives occurring in the Commonwealth, the priority areas chosen align with the Maternal Health Strategic Action Plan which was released in March 2026. Priorities include:

Recommendations for each priority area are organized by the groups that interact with perinatal individuals:

Provider: someone with training and expertise who provides care, treatment, and/or professional advice to an individual before, during, or after pregnancy.

Facility: a physical location where care is provided and can include inpatient and outpatient centers, clinics, hospitals, and urgent care centers.

Systems: the interacting entities that support services before, during, and after pregnancy, including health care systems, payors, and public programs.

Community: a group with a shared sense of place or identity ranging from physical neighborhoods to groups based on common interests and shared circumstances.

Because of the continued disparity in pregnancy-related deaths of individuals who are Black, this report includes a crucial section highlighting recommendations to save Black lives.

PRIORITY: Improving Access to High-Quality Care

Access to high-quality care in the perinatal period must be available to everyone in Pennsylvania. The MMRCs identified gaps in access to care, which can be limited by insurance coverage, proximity to care, and social factors such as transportation. Insufficient access leads to disparities in care, adverse health outcomes, and missed opportunities for early intervention. By implementing these recommendations, access to high-quality care can be improved to meet the unique needs of all perinatal individuals, promote optimal pregnancy outcomes, and reduce the risk of pregnancy-related death.

The MMRCs recommend the following actions for this priority:

Improve Coordination of Care

For Providers:

- In any case, but especially when a patient is at-risk for self-directed discharge, providers need to coordinate with the patient's other care providers and supports, including family and nonclinical providers, to encourage follow-through with treatment.
- Emergency Department (ED) providers need to:
  - assess for pregnancy within the past year for all patients to help identify postpartum warning signs, including hypertension.
  - facilitate entry to prenatal care for pregnant patients who are not yet receiving it.

A self-directed discharge occurs when an individual leaves the hospital before it is recommended by their treatment provider. It can occur for many reasons, including when there is mistrust of the system, uncontrolled pain, or unmet social needs, such as child care.

    - coordinate with an OBGYN on discharge plans for perinatal individuals.
    - provide warm hand-offs to community resources.
    - coordinate with OBGYN teams when a perinatal individual has suspected or confirmed influenza.

Hypertension, or high blood pressure, during pregnancy can lead to complications for the perinatal individual and the fetus.

- All hospital providers need to immediately coordinate with an OBGYN when any obstetric emergency arises anywhere in the hospital.
- Providers, including primary care providers (PCP), need to include full provider contact information in medical records, obtain releases, and communicate with other providers to verify treatment plans, appointments, and medications.

For Facilities:

- EDs need to include social workers, peer navigators, or other staff who coordinate discharge plans, support transitions, and provide warm hand-off referrals.
- Facilities need to ensure that patients who are at high-risk for perinatal complications, especially those with a history of self-directed discharge, are scheduled for follow-up appointments, with support from social workers, case managers, or peer specialists to navigate them through care.
- Facilities need to arrange for follow-up appointments for perinatal individuals with critical or acute conditions, and ensure adequate monitoring and timely intervention to address complications. Receiving facilities need to contact referring facilities if the individual does not attend their appointment.
- Birth facilities need to ensure that a patient's initial postpartum follow-up appointment is scheduled prior to discharge from the delivery event. Receiving facilities need to contact referring facilities if the individual does not attend their appointment.
- All facilities treating perinatal individuals need to follow up on missed appointments within 48 hours and review medical risks of missing treatment or appointments with patients upon contact.

Train and Support Providers

For Facilities:

- Perinatal facilities need to train providers on:
    - qualitative and quantitative blood loss (QBL) monitoring for delivery and postpartum care.

- early recognition and treatment of postpartum hemorrhage and sepsis, including pre-delivery training, post-care debriefs, and annual simulation-based training.
- consideration of hysterectomy when cardiovascular collapse occurs.
- recognition of when to take and/or return a patient to the operating room for persistent bleeding.
- trauma-informed care and implicit bias, including avoiding stigmatizing language in medical records, with continuing education annually.
- referring individuals with a history of difficult-to-control hypertension for a baseline echocardiogram to identify cardiac issues.

Implicit bias is the unconscious attitudes or stereotypes that affect our understanding and actions without awareness or control.

- EDs need to train staff on obstetric emergencies including hemorrhage protocols, massive transfusion protocol (MTP), and hypertensive disorders in the perinatal period.
- All facilities need to train providers on:
  - medications contraindicated in pregnancy, such as ACE inhibitors.
  - risks and benefits of diagnostic imaging during pregnancy.
  - perinatal cardiology education, including warning signs.
  - recognizing rare infections presenting as perineal pain/swelling and appropriate diagnostic testing.
  - evidence-based recommendations related to vaccination against COVID-19, influenza, and other diseases.
  - having a low threshold for admitting patients with difficult-to-control hypertension who develop preeclampsia.

For Systems:

- Health systems need to require the use of the Alliance for Innovation on Maternal Health (AIM) obstetric hemorrhage safety bundle.
- Health systems need to reinforce guidance that medically indicated anticoagulation should not be stopped until clinically indicated, in patients who have a miscarriage with a history of deep vein thrombosis (DVT) in pregnancy.

An AIM safety bundle is a collection of evidence-based practices designed to improve care and reduce severe morbidity and mortality for perinatal individuals.

- Health systems need to provide a blood pressure cuff if they don't already have one and guidance for home monitoring to all perinatal individuals with hypertension.

- Health systems need to consider admission for an individual with poorly controlled hypertension at any stage in the perinatal period to optimize medication adherence and assure blood pressure control prior to discharge.
- DOH needs to fund a consultation line for providers who need extra support treating perinatal patients.

Educate Patients and the Public

For Providers:

- Providers need to educate patients and their families at discharge on standardized postpartum warning signs, such as the Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) POST-BIRTH. Warning signs need to be reinforced during any follow-up visits or phone calls to ensure awareness and timely action if needed.

> POST-BIRTH is an online course with program resources to educate clinical staff about postpartum warning signs and maternal morbidity and mortality.

- Providers need to ensure that at every visit, patients understand their diagnosis, condition management, and medications, in their preferred language, regardless of their educational background, by using a variety of methods to confirm understanding.
- For patients wanting to seek alternative/holistic options, providers need to ensure they understand evidence-based treatment options, risks, benefits, and the risks of no treatment.
- Providers need to ensure that patients with obesity are counseled on healthy pregnancy weight gain, nutrition, and referred to a dietitian when appropriate.
- Providers need to make a referral and warm hand-off to a specialist when an individual with one or more chronic conditions, such as obesity, presents for care, whether they are pregnant at the time or may become pregnant in the future.
- Providers need to educate all pregnant individuals on COVID-19, influenza, and all other vaccinations that are recommended during the perinatal period, explaining risks and benefits. If a patient declines a vaccine, providers need to use motivational interviewing to understand their reasons.

> Informed consent for vaccinations is important because it builds trust in the health care system while giving the patient autonomy.

For Facilities:

- Urgent care facilities need to be trained to provide warning signs education to postpartum individuals.

For Systems:

- Health systems need to develop evidence-based standards for multidisciplinary responses when individuals decline recommended care.

For Communities:

- CPR training needs to be available for free in all communities and advertised in childbirth classes, during prenatal care, and in hospital discharge materials.

Advance Racial and Cultural Justice

For Providers:

- Providers need to deliver care to patients that is free of bias and stigma. Medical records documentation also needs to be free of bias and stigma.
- Providers need to use translation services to provide education in the individual's preferred language for every encounter, but especially when reviewing urgent warning signs.

For Systems:

- Public health agencies, such as the CDC, need to address research gaps on how race, ethnicity, gender, racism, and systemic stressors affect the health of perinatal individuals.
- Health systems need to provide annual, widely disseminated anti-racism and anti-bias trainings, such as the Upstander Project.
- Medical schools and training programs need to integrate early, consistent anti-bias education in all curricula.

For Communities:

- Community organizations, including religious institutions, need to promote awareness of supportive services available to the immigrant population.

PRIORITY: Addressing Community Factors that Impact Health Outcomes

Community factors are the circumstances and environments that impact an individual's health. They include access to safe and affordable housing and transportation, access to healthy, affordable food and opportunities for physical activity, and educational and career opportunities. Health care providers, including those caring for perinatal individuals, play a key role in identifying individuals' social needs through screenings. Each interaction allows opportunity for immediate intervention and connection to resources. Identifying barriers to care is the first of many steps in addressing community factors and saving lives.

The MMRCs recommend the following actions for this priority:

Strengthen Supports for Addressing Intimate Partner Violence (IPV)

IPV is a pattern of coercive behaviors used by a current or former intimate partner to gain power and control over another person. During the perinatal period, IPV may involve physical, emotional, or sexual abuse, intimidation and threats, isolation, stalking, deprivation of resources, interference with prenatal or postpartum care, and reproductive coercion, including pressure around pregnancy decisions.

For Providers:

- Providers need to deliver private, routine, and validated IPV screening for all perinatal individuals at all encounters.

For Facilities:

- Facilities need to provide ongoing training for all relevant personnel, including health care providers and courthouse staff, on best practices for confidential IPV screening, early warning signs of IPV, and warm hand-off referrals.

For Systems:

- The justice system needs to require that judges expedite Protection from Abuse orders for perinatal individuals.

For Communities:

- Communities need to embed IPV prevention into community gun-violence prevention initiatives, and the Pennsylvania State Board of Education needs to include it in school standards before grade nine.

Ensure Sufficient Funding

For Systems:

- Insurers and government agencies need to provide comprehensive paid family leave and affordable health care coverage for perinatal individuals, including longer scheduled visits for patients at high-risk for poor birth outcomes and extended hospital recovery for high-risk or traumatic births.
- Payors need to provide reimbursement for all completed social and behavioral health screenings and adequate time during appointments for warm hand-off referrals and follow-up.
- Insurers and government agencies need to increase funding for home-visiting after a perinatal individual is discharged from a hospital encounter. Home visitors can provide screenings, warm hand-off referrals, and education.

Warm hand-off referrals ensure that an individual is connected directly to the entity who can provide services.

- Systems need to create emergency child care support to reduce Children and Youth Services (CYS) referrals/needs.

Improve Coordination of Care

For Providers:

- Health care providers need to coordinate with social support programs to maximize patient engagement when social needs are identified.
- WIC and health care providers need to collaborate to provide supportive resources when social needs are identified.

WIC is an important federal nutrition program that provides healthy foods, nutrition education, breastfeeding support, and referrals to services for low-income pregnant individuals, new parents, infants, and children under age five at nutritional risk.

For Facilities:

- Facilities need to confirm access to transportation or provide transportation assistance to encourage follow-through with services and referrals.
- If a perinatal individual moves, facilities need to offer or facilitate transfer of care to alternative care closer to the individual's new location.

For Systems:

- Health care systems need to create safety net protocols to aid providers in scheduling patient follow-up to address social needs.
- Insurers need to provide reimbursement programs for transportation to health care appointments when there is a need.

Advance Racial and Cultural Justice

For Providers:

- All providers, regardless of specialty, need to ensure that resources and services are provided in the language spoken by the individual or an interpreter is used.

For Systems:

- The federal government needs to prioritize visas for family members of perinatal individuals.

Screen and Provide Warm Hand-Off Referrals

For Providers:

- All providers need to screen for Adverse Childhood Experiences and to recommend treatment and provide warm hand-off referrals when needs are identified.

For Systems:

- Health systems need to require that providers assess social needs that may affect follow-through with recommended treatment and medication. When needs are identified, there needs to be follow-up and warm hand-off referrals. Referrals may include engaging with financial support, child care options, or transportation.
- When a lack of social or family support is identified, health systems need to engage with community supports such as a doula, case manager, social worker, or peer navigator.

A doula provides non-medical comfort, knowledge, and support through a significant health-related experience, such as pregnancy, childbirth, pregnancy loss, or postpartum.

PRIORITY: Improving Rural Health and Maternity Care Deserts

All perinatal individuals deserve dependable and equitable access to care, regardless of where they live. Forty-eight of Pennsylvania's 67 counties are deemed rural as defined by the Center for Rural Pennsylvania. In 2020, nearly 3.4 million people, or about 26% of the state's 13 million residents, lived in a rural county.[6] Living in rural counties can pose many challenges to residents' health care, especially while pregnant or postpartum. Specialized health care is needed for perinatal individuals, yet 7.5% of PA's rural counties are Maternity Care Deserts, defined by the March of Dimes as any county in the United States without a hospital or birth center offering obstetric care and without any obstetric providers.[7] In rural areas across the state, 47.6% of women live over 30 minutes from a birthing hospital compared to 11.9% of women living in urban areas. Traveling farther for care can impact attendance at perinatal appointments and timeliness of care during birth or an emergency.

Rural residents face unique challenges and solutions to quality, equitable health care.

The MMRCs recommend the following actions for this priority:

For Providers:

- Hospital health care providers need to actively communicate with outpatient providers to coordinate care for those who have a self-directed discharge.

For Systems:

- Health systems need to ensure that patients with SUD are offered a treatment consultation prior to discharge. The consultation can be completed by an addiction medicine specialist, psychiatrist, or through a partnership with a community-based organization that provides addiction support services.
- State and local agencies need to financially incentivize psychiatrists, addiction medicine specialists, nurse practitioners, and midwives to deliver treatment in rural and underserved areas.

PRIORITY: Supporting Behavioral Health and Substance Use Disorder Needs

Behavioral health includes SUD and other mental health conditions, and it encompasses the emotional, psychological, and social wellbeing of an individual. Perinatal behavioral health conditions are the leading cause of death for pregnancy-related deaths in Pennsylvania. Left untreated, perinatal mood and anxiety disorders, including depression, anxiety, and SUD, increase the risk for pregnancy-related death.

More behavioral health care services for perinatal individuals are needed, and more practitioners must be trained and made available to meet the need. Pennsylvania's data highlights the importance of screening perinatal individuals with validated tools to identify unmet needs and connecting individuals through warm hand-off referrals to qualified practitioners to provide resources, treatment, education, and support.

SUD is a type of mental health condition. It is very common for an individual with SUD to also have other mental health conditions.

The MMRCs recommend the following actions for this priority:

<u>Screen and Provide Warm Hand-Off Referrals</u>

For Providers:

- Providers need to use validated, evidence-based screening tools to assess all perinatal individuals for SUD and other mental health conditions, at intake and during each trimester, during an infant's NICU stay, during pediatric appointments in the year following pregnancy, and at all ED encounters. All positive screens need to be followed up with a warm hand-off referral.

- All care providers for children and adolescents need to identify mental health conditions early and refer to treatment to help prevent the increased risk of SUD later in life.
- Inpatient providers need to refer perinatal individuals with symptoms of a mental health condition for a full psychiatric evaluation prior to discharge.

For Facilities:

- Before discharge, birth facilities need to schedule outpatient appointments for individuals with known mental health conditions.
- All individuals who present to the ED need to be screened for SUD and mental health conditions to increase adherence to care and reduce stigma.
- EDs need to train all health care providers in Screening, Brief Intervention, and Referral to Treatment (SBIRT) and establish standards for peer recovery services.

SBIRT is a public health approach to the delivery of early brief treatment and referral for individuals with SUD.

For Systems:

- Health systems need to require a comprehensive postpartum mental health screening within three weeks of delivery for all perinatal individuals at heightened risk for perinatal mood and anxiety disorders.
- Health systems need to mandate warm hand-off referrals for mental health conditions, including SUD, whenever a screen is positive.

Train and Support Providers

For Facilities:

- EDs need to have evidence-based standards for withdrawal management and follow the standards any time withdrawal is suspected.
- EDs need to provide ongoing training to providers on the diagnosis and treatment of all perinatal mood and anxiety disorders, including SUD and postpartum psychosis. Facilities need to support providers in completing warm hand-off referrals when needed.

For Systems:

- Obstetric provider residency and certification programs need to provide training in mental health and SUD for all provider types to aid in diagnosis and treatment and to reduce stigma.

- Psychiatric residency programs need to include perinatal mood and anxiety disorders in their core curriculum to aid in diagnosis and treatment and to reduce stigma.
- Health systems need to provide annual training to all perinatal prescribers on perinatal mood and anxiety disorders, psychiatric medications, and resources. Training needs to also include addressing stigma and managing withdrawal.
- Health systems need to train all providers that treat perinatal individuals on American College of Obstetricians and Gynecologists (ACOG) clinical guidelines for treating psychiatric illness in the perinatal period, including the strong recommendation to not discontinue or withhold psychotropic medication because of pregnancy or lactation.
- Health systems need to train and support providers so that if a patient is stable on mental health medication prior to pregnancy, health care providers are able to outline risks versus benefits of discontinuing the medication during pregnancy, allowing for shared decision-making. If clear, evidence-based guidance is not available on use of a medication during pregnancy or lactation, MFM needs to be consulted.

Improve Coordination of Care

For Providers:

- When mental health concerns are identified, hospital providers need to consult with psychiatrists or other mental health prescribers for medication management.
- Health care providers need to refer perinatal individuals with mental health conditions to home visitors to encourage continuity of care.
- When health care providers discover that recommended mental health treatment is not being followed, they need to engage in motivational interviewing to understand and address any barriers to care.
- All inpatient providers need to obtain the names and contact information for a patient's outpatient providers, collaborate with those providers, and document all the information in the medical records.
- Behavioral health and other medical providers need to regularly collaborate for the best possible coordination of care.

For Facilities:

- Hospitals need to employ Certified Recovery Specialists or peer navigators to assist individuals with SUD prior to discharge, especially when individuals decline resources to assist with treatment.

For Systems:

- Health and social systems need to work together to ensure equitable use and application of a Plan of Safe Care for perinatal individuals. A Plan of Safe Care cannot be used in a punitive nature and must support the safety and wellbeing of both the substance-affected infant and their caregiver.

A Plan of Safe Care lists and directs services and supports to ensure the safety and wellbeing of a substance-affected infant and their caregivers.

- Payors and health systems need to facilitate co-location of mental health and perinatal services to encourage continuity of care and collaboration by care providers.
- Payors and health systems need to collaborate to improve treatment for co-occurring SUD and other mental health conditions.
- All Centers of Excellence need to be equipped to care for the unique needs of perinatal individuals with Opioid Use Disorder (OUD), especially when there are co-occurring mental health conditions.

DHS designates health centers as Centers of Excellence, which ensure every individual with OUD achieves optimal health, including the treatment of medical conditions, OUD, and other mental health conditions. Centers of Excellence also link each individual with a peer recovery specialist.

- Health systems need to ensure that perinatal individuals with SUD are offered a consultation with an addiction medicine specialist, psychiatrist, or through a partnership with a community-based organization that provides addiction support services prior to discharge.
- Behavioral health systems need to prioritize and expedite treatment of perinatal individuals who request treatment for SUD or other mental health conditions, including medication.

Support Harm Reduction

For Providers:

- Providers need to educate perinatal individuals and when possible, their support people, on overdose recognition and naloxone administration. Naloxone needs to be provided free of charge to every perinatal individual with a history of SUD.

Harm reduction focuses on working with people without judgement, coercion, and discrimination. It aims to minimize the negative health, social, and legal impacts associated with the use of substances.

Naloxone is a life-saving medication that quickly reverses an opioid overdose.

- Providers need to educate perinatal individuals with a history of SUD on the existence of fentanyl and other illicit substances in the drug supply at every encounter. Fentanyl test strips need to be provided to all perinatal individuals with a history of SUD.

For Facilities:

- OBGYN facilities and EDs need to have harm reduction materials and resources posted in each exam room and bathroom.

For Systems:

- Naloxone needs to be available at all gas stations, convenience stores, and other high-traffic private businesses, with instructions on use.
- Legislation needs to support supervised, safe consumption sites.

PRIORITY: Expanding and Diversifying the Maternal Health Workforce

The maternal health workforce includes clinical providers, such as physicians, licensed therapists, registered nurses, and certified nurse midwives, and nonclinical providers, like doulas, home visitors, social workers, and peer support specialists. The leading cause of pregnancy-related death in Pennsylvania is mental health conditions which include perinatal mood and anxiety disorders, SUD, and other mental health conditions. Increasing access to behavioral health providers, particularly those trained in perinatal care, is essential for improving maternal health outcomes. It is also essential to diversify the perinatal workforce, making it possible for all individuals to find culturally congruent care.

The MMRCs recommend the following actions for this priority:

For Systems:

- The state government or other systems need to financially incentivize individuals to join the maternal health workforce, including psychiatrists, addiction medicine specialists, nurse practitioners, and midwives.
- The state government or other systems need to incentivize psychiatrists to specialize in the perinatal population in areas of the state with too few psychiatrists.

For Communities:

- Community organizations need to develop online tools to help connect individuals to culturally congruent providers.

Preventing Pregnancy-Related Deaths of Black Individuals

The impact of structural and systemic racism is deeply embedded in American history and is acutely felt by the Black community. Beliefs about racial differences in pain sensitivity, rooted in the history of slavery, continue to shape medical care today, leading some clinicians to underestimate and undertreat the pain of Black patients.[8] Gynecology was founded by dangerous, painful experiments on Black individuals under no anesthesia.[9] These factors are central to the health disparities that continue to affect Black individuals today. Many of the MMRCs' recommendations for actionable prevention strategies highlight the evident bias, discrimination, and racism, some of which may not be intended or recognized. The roots of the disparities in maternal morbidity and mortality among Black individuals are complex and historic, stemming from structural racism and implicit bias.[10] Black bodies are not inherently flawed; rather, the systems intended to care for them are.

The Pennsylvania Black Maternal Health Caucus was formed in the Pennsylvania House of Representatives in 2023 to address the disparities. The Caucus is working to advance legislation known as the Pennsylvania MOMNIBUS, which is a comprehensive package of investments and policy reforms to improve maternal health outcomes.

Communities must act now to prevent future pregnancy-related deaths of Black individuals. Specific actions to address disparities that must be taken now include:

- **Listening to Black individuals**. While important public health initiatives like the HEAR HER campaign exist, all care providers need to actively listen when Black individuals raise concerns.[11] Black individuals know their bodies best and need to have access to doulas and other support roles in their communities who encourage them to self-advocate and to find providers who they trust.
- **Respecting Black individuals as humans**. The dehumanization of individuals perpetuates racism. It is essential to recognize and value each birthing individual for who they are, independent of societal biases.
- **Engaging with Black communities**. Organizations and individuals rooted in Black communities are familiar with and already making efforts to solve this crisis. Partners need to listen to and follow their lead. National organizations like the Black Mamas Matter Alliance advocate, educate, and shift power for Black health, rights, and justice.[12]
- **Training all care providers.** Training and routine continuing education on stigma, bias, and racism, and their effects on health, needs to be provided to all care providers who engage with Black perinatal individuals.

- **Engaging Black men.** Black men often feel invisible in the health care space and believe their voices are not heard. The health care system needs to embrace Black men in the perinatal space so that families and communities feel supported.
- **Addressing community factors that impact health outcomes.** Housing, transportation access, food security, and other social factors are vital to the health of Black perinatal individuals. By supporting these social factors, partners support the overall health and wellbeing of Black individuals.
- **Supporting workforce diversity.** The barriers that limit a diverse perinatal workforce, including doulas and mental health providers, need to be understood and removed. Black individuals need to have culturally congruent care available to them.[13]

When these actions are ingrained in society and in the care of Black individuals, partners will move toward earning the trust of Black individuals and communities. Trust is the foundation for meaningful change.

Strengths and Limitations

Timeliness of Case Review

Pennsylvania is considered a high-burden state with many pregnancy-associated deaths reported annually. Because of the time required to identify cases, request necessary medical and social records, fully abstract cases, and review cases, there is a delay in reporting final data and recommendations. Steady improvements were made to reduce the delay, including creating and filling program positions, improving efficiency of reviews during PA MMRC meetings, and improving program and committee policies and procedures. For the first time since its inception, the PA MMRC reviewed a year of cases (2022) in less than one calendar year.

Mortality Ratios

The PRMR is calculated based on reported live births. These are not inclusive of pregnancies that did not result in a live birth (e.g., terminated pregnancies, ectopic pregnancies, still births).

Autopsy Requirements

While autopsies are not required to be performed on perinatal individuals, they can be important in determining the cause of death, determining pregnancy-relatedness, and creating recommendations to prevent future deaths. Funding should be made available to complete an autopsy on every perinatal individual. In 2022, at least 44% of cases did not include an autopsy.

Consideration of Pregnancy Termination

PA MMRP has no way to match death certificate data to pregnancy termination data to determine if any of those individuals died within 365 days of being pregnant. Cases may be identified through the pregnancy checkbox on the death certificate if the death certifier was aware of the pregnancy.

Documentation and Sharing of Records

All entities that serve perinatal individuals should standardize and follow investigation and documentation protocols for all pregnancy-associated deaths. Transparent, unbiased documentation ensures the ability to understand circumstances surrounding a pregnancy-associated death. Additionally, while Act 24 gave the authority for DOH to receive records for all pregnancy-associated deaths, some entities do not comply with the requests. Participation is vital to create a complete picture of an individual's life and death through comprehensive records. When records are shared, the MMRCs are better equipped to make recommendations aimed at preventing future deaths.

Implemented Recommendations

Since the development of the last report, the MMRP is aware of the following implemented activities related to PA MMRC recommendations:

- securing additional funding to continue the statewide network of behavioral health consultation for perinatal care providers (Perinatal TiPS).
- developing regional maternal health coalition action plans.
- forming the Perinatal Action Collaborative which prioritizes strategies to improve health and mobilizes action to implement strategies for the Maternal Health Strategic Action Plan.
- promoting of AIM's Postpartum Discharge Transition bundle by the Pennsylvania Perinatal Quality Collaborative for the 2026/2027 implementation year.

We request that organizations implementing MMRC recommendations notify the MMRP by emailing the resource account, ra-dhmmrc@pa.gov. These updates help the MMRP understand how the recommendations are used and evaluate their effect on maternal health work.

Closing Statement

Significant time and effort by the PA and Philadelphia MMRCs were dedicated to reviewing pregnancy-associated deaths and identifying opportunities for interventions to prevent future deaths. The data and recommendations from the review and analyses of 2022 case review are used to inform federal, state, and local governments, community-based organizations, health care systems and providers, and pregnant individuals and their support systems. With continued dedication and commitment from the PA and

Philadelphia MMRCs, the MMRP looks forward to continued collaboration with partners to ensure the efforts to address disparities in all forms of care, prevent future pregnancy-related deaths, and promote improved health of all perinatal individuals are put into practice and policy.

Appendix: Methods

Case Identification Process

Pregnancy-associated deaths in Pennsylvania are identified through vital records data from the DOH, Bureau of Health Statistics and Registries (BHSR). Using death certificate information, deaths of Pennsylvania residents assigned female at birth and of reproductive age (10-60 years) are identified. From this information, the identified deaths are verified by linking fetal deaths and/or births within 365 days prior to death. Finally, any death identified by the death certificate's pregnancy checkbox is evaluated for individuals that were not linked by a fetal birth or death certificate. If a death certificate's checkbox was marked "unknown if pregnant within the past year" further confirmations are performed by BHSR and the MMRP.

Case Abstraction Process

Record abstractors are responsible for creating de-identified case summaries for each confirmed case of pregnancy-associated death to present to MMRC members. The team is responsible for collecting records including death certificates, fetal birth or death certificates, hospital and outpatient facility records, behavioral health treatment center records, social service notes, coroner and medical examiner reports, law enforcement documents, court documents, medical transportation records, obituaries, and media searches. The PA MMRP also uses the PA National Electronic Disease Surveillance System (PA-NEDSS) to identify COVID-19 and Hepatitis C diagnoses and PA Prescription Drug Monitoring Program (PDMP) to identify prescriptions for Schedule II to V drugs. Record abstractors review all available records and make additional requests for information as additional sources are identified. If records are not received during the initial request, a second request is made. While the response rate for receiving records has improved, there were still instances for 2022 deaths where records were not received when requested.

Access to available records is essential for creating a case summary that highlights the life events and circumstances surrounding each individual's pregnancy and death in an unbiased manner. Record abstractors input available case data into the CDC's Maternal Mortality Review Information Application (MMRIA). This system collects many variables including decisions from committee review. Data are used for analyses at a state and national level.

Internal Case Review

Cases are internally reviewed by vice chairs when the death is determined to be accidental with no intent of harm (e.g., individual is a passenger in a motor vehicle accident), when the decedent was a bystander in a random act of violence, or when

crucial records were unavailable or not received, making committee determinations and recommendations difficult without speculation.

Full Committee Case Review

The PA MMRC meets monthly, while the Philadelphia MMRC meets quarterly. All cases are reviewed using the CDC's MMRIA Committee Decision Form to record key information on pregnancy-relatedness, completeness of records, circumstances surrounding the death, and manner of death. The committees make determinations on the following questions for each case:

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

References/Citations

[1] Hoyert, D. L. (2024, May 2). Maternal mortality rates in the United States, 2022. Centers for Disease Control and Prevention. https://www.cdc.gov/nchs/data/hestat/maternal-mortality/2022/maternal-mortality-rates-2022.htm

[2] Centers for Disease Control and Prevention. "Severe Maternal Morbidity." *Centers for Disease Control and Prevention*, 15 May 2024, https://www.cdc.gov/maternal-infant-health/php/severe-maternal-morbidity/index.html

[3] World Health Organization. *International Statistical Classification of Diseases and Related Health Problems*. 10th rev., 2008 ed., World Health Organization, 2009.

[4] Pennsylvania Department of Health. "Enterprise Data Dissemination Informatics Exchange (EDDIE)." 17 Dec. 2025, https://www.phaim.health.pa.gov/EDD/Default.aspx

[5] Hardeman, R.R., 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." *Maternal and Child Health,* 26, 2022, pp. 661-669. https://link.springer.com/article/10.1007/s10995-021-03284-3

[6] The Center for Rural Pennsylvania. "Rural Urban Definitions." 26 Nov. 2025, https://www.rural.pa.gov/data/rural-urban-definitions.cfm

[7] Stoneburner, A., et al. *Nowhere to Go: Maternity Care Deserts Across the US.* Report no. 4, March of Dimes. 2024, https://www.marchofdimes.org/maternity-care-deserts-report

[8] Hoffman, K.M., et al. "Racial Bias in Pain Assessment and Treatment Recommendations, and False Beliefs About Biological Differences Between Blacks and Whites." *Proceedings of the National Academy of Sciences,* vol. 113, no.16, 2016, pp. 4296-4301. https://doi.org/10.1073/pnas.1516047113

[9] Hill, Maia A. "The Stain of Slavery on the Black Women's Body and the Development Gynecology: Historical Trauma of a Black Women's Body." *The Macksey Journal*, vol. 1, art. 86, 2020.

[10] Njoku, A., et al. "Listen to the Whispers Before They Become Screams: Addressing Black Maternal Morbidity and Mortality in the United States." *Healthcare,* vol. 11, no. 3, 2023, p. 438. https://www.mdpi.com/2227-9032/11/3/438

[11] Centers for Disease Control and Prevention*. HEAR HER Campaign,* 24 Nov. 2025, https://www.cdc.gov/hearher/index.html

[12] Advancing Black Maternal Health, Rights, & Justice. *Black Mamas Matter Alliance.* 24 Nov. 2025, https://blackmamasmatter.org/

[13] Saha, S. et al. "Patient-Physician Racial Concordance and the Perceived Quality and Use of Health Care." *Archives of Internal Medicine*, vol. 159, no. 9, 1999, pp. 997-1004. https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/485025