



Department of  
Health

Department of  
Children & Youth

# A Report on Pregnancy-Related Deaths in Ohio

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2020



**Department of  
Health**

**Department of  
Children & Youth**

The Ohio Department of Health (ODH) and the Ohio Department of Children and Youth (DCY) express gratitude to those who have contributed to and supported the vital work of the Pregnancy-Associated Mortality Review (PAMR) committee. With a mission to review all pregnancy-associated deaths in Ohio, as well as develop recommendations for the prevention of maternal deaths, we thank committee members for closely reviewing each death and their devotion to thoughtfully constructing recommendations to prevent future deaths. We extend our gratitude to those who are implementing PAMR recommendations in their communities. With deep respect and reverence, we dedicate this report to the memory of the 130 women who died of pregnancy-associated deaths in 2020 and their loved ones.

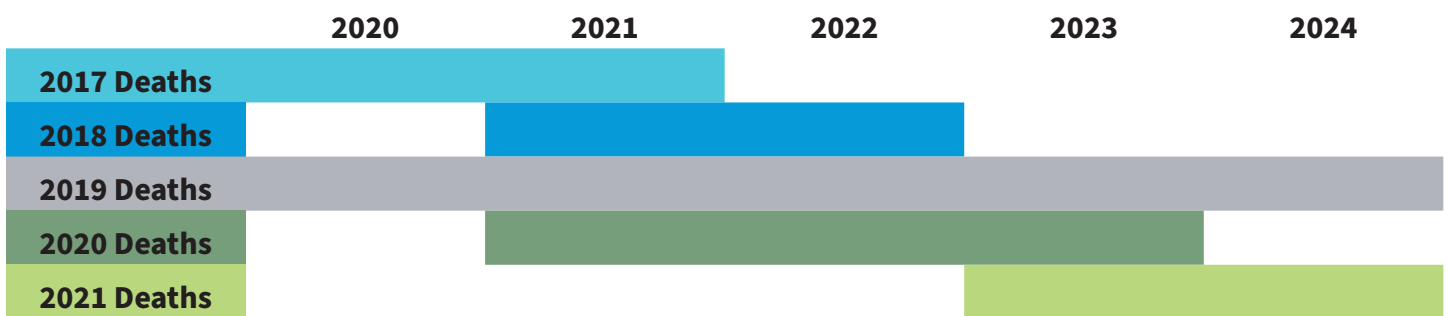
# TABLE OF CONTENTS.

<b>INTRODUCTION.....</b>	<b>4</b>
<b>DEFINITIONS.....</b>	<b>5</b>
<b>KEY FINDINGS.....</b>	<b>6</b>
<b>PREGNANCY-RELATED DEATHS.....</b>	<b>6</b>
<b>RACIAL DISPARITIES IN PREGNANCY-RELATED DEATHS.....</b>	<b>7</b>
<b>LEADING CAUSES OF PREGNANCY-RELATED DEATHS.....</b>	<b>8</b>
<b>COVID-19.....</b>	<b>9</b>
<b>LEADING CAUSES OF DEATH BY RACE/ETHNICITY.....</b>	<b>10</b>
<b>TIMING OF PREGNANCY-RELATED DEATH.....</b>	<b>11</b>
<b>TIMING OF PREGNANCY-RELATED DEATH BY RACE/ETHNICITY .....</b>	<b>11</b>
<b>LEADING CAUSES OF DEATH VARIED BY TIMING.....</b>	<b>12</b>
<b>PREVENTABILITY OF PREGNANCY-RELATED DEATHS.....</b>	<b>12</b>
<b>PREVENTABILITY OF PREGNANCY-RELATED DEATHS, BY CAUSE OF DEATH.....</b>	<b>13</b>
<b>CONTRIBUTING FACTORS TO PREGNANCY-RELATED DEATHS.....</b>	<b>14</b>
<b>PAMR RECOMMENDATIONS, BY CONTRIBUTING FACTORS.....</b>	<b>15</b>
<b>DATA-TO-ACTION.....</b>	<b>17</b>
<b>APPENDIX A. PAMR PROCESS.....</b>	<b>19</b>
<b>APPENDIX B. PAMR DATA TRENDS, METHODOLOGY, UPDATES, AND SUPPLEMENTAL DATA.....</b>	<b>22</b>
<b>APPENDIX C. COMMITTEE DECISION FORM.....</b>	<b>28</b>
<b>APPENDIX D. CONTRIBUTORS &amp; ACKNOWLEDGEMENTS.....</b>	<b>33</b>
<b>APPENDIX E. REFERENCES.....</b>	<b>34</b>

# INTRODUCTION

This report examines pregnancy-related deaths and fulfills the legislative requirements outlined in [Ohio Revised Code Section 3738.08](#). Stakeholders are encouraged to review the PAMR process in Appendix A of this document to learn how pregnancy-associated death data is collected and relatedness is determined. Please note that this report reflects only a single year of data. Due to staffing and COVID-19 related challenges, review of 2017 deaths was completed in January of 2021. Review of 2018 deaths began in late 2020 and was completed in January of 2022. To achieve more timely data and prioritize the review of deaths related to COVID-19, ODH made the difficult decision not to review 2019 deaths. Vital Statistics data for 2019 deaths was still collected and will be used to examine pregnancy-associated trends over time.

**PAMR Committee Case Review, by Year**

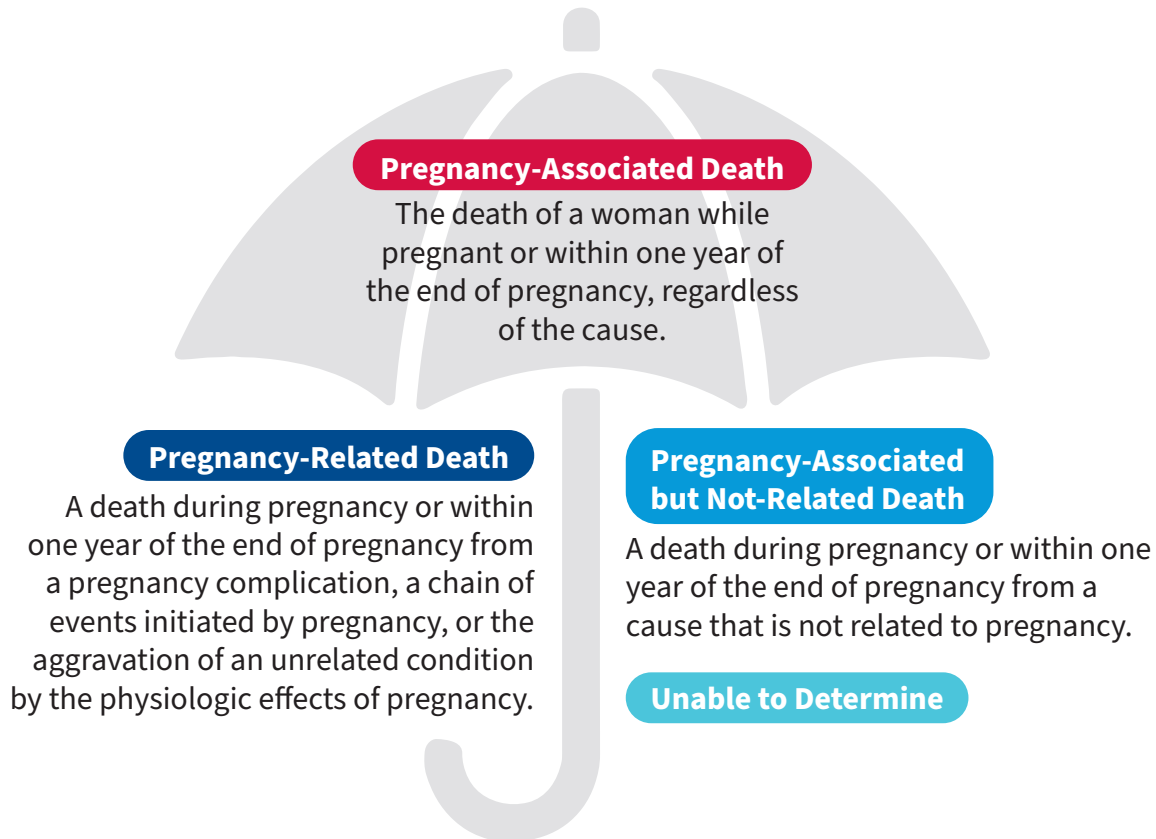


Review of 2020 deaths was initiated in January of 2021 and completed in September of 2023. During this time, 127 pregnancy-associated deaths for 2020 were reviewed over the span of 14 PAMR committee meetings. PAMR prioritized review of the six deaths where a COVID-19 diagnosis was identified. It took an average of 43 hours to abstract each death for 2020, and an average of 9 deaths were reviewed in each committee meeting. For more information about the PAMR review process please reference Appendix A.

Review of 2021 deaths began in September 2023.

## DEFINITIONS

**These definitions help the PAMR committee answer the question,**  
*“If the woman had not been pregnant, would she have still died?”*  
**If the answer is no, then that death is considered pregnancy-related.**



**Pregnancy-associated death:** The death of a woman while pregnant or anytime within one year of the end of pregnancy, regardless of cause.

**Pregnancy-related death:** The death of a woman while pregnant or within one year of the end of pregnancy, regardless of duration and site of pregnancy, from any cause related to or aggravated by her pregnancy or its management (e.g., 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:** The death of a woman while pregnant or within one year of the end of pregnancy, due to a cause unrelated to pregnancy.

**Pregnancy-associated, but unable to determine pregnancy-relatedness:** The death of a woman while pregnant or within one year of the end of pregnancy, due to a cause that could not be determined to be pregnancy-related or not pregnancy-related.

**Pregnancy-associated mortality ratio (PMR):** The number of pregnancy-associated deaths per 100,000 live births.

**Pregnancy-related mortality ratio (PRMR):** The number of pregnancy-related deaths per 100,000 live births.

**Chance to Alter Outcome:** The review committee determination if there was no chance, some chance, or a good chance “of the death being averted by one or more reasonable changes to patient, family, community, provider, and/or systems factors.”

**Preventability:** A death is considered preventable if the committee determines that there was at least some chance of the death being averted.

**Contributing Factor:** Factors identified by the review committee that contributed to the death. These are steps that, if altered, may have prevented the woman’s death. There may be multiple contributing factors and they may be related to the patient, the community, health care providers, facilities/hospitals where the woman sought care, and the systems that influence the lifestyle, care, and health services for the woman.

## KEY FINDINGS

- 28% (n=35) of pregnancy-associated deaths were determined to be pregnancy-related.
  - » 66% of pregnancy-related deaths were deemed preventable.
- The pregnancy-related mortality ratio (PRMR) for non-Hispanic White women was 25.7 deaths per 100,000 live births in 2020, while the PRMR for non-Hispanic Black women was 38.5 deaths per 100,000 live births.
  - » Non-Hispanic Black women were overrepresented among pregnancy-related deaths.
- Infection was the leading cause of death overall (31%).
  - » Deaths due to COVID-19 are included in pregnancy-related deaths due to infection.
  - » 45% of pregnancy-related deaths due to infection were deemed preventable.
- Inadequate assessment of risk was the most frequently identified factor that contributed to pregnancy-related deaths in 2020.
- Multiple levels of actions within systems, facilities, communities, and among providers are needed to reduce pregnancy-related deaths and improve maternal health outcomes.

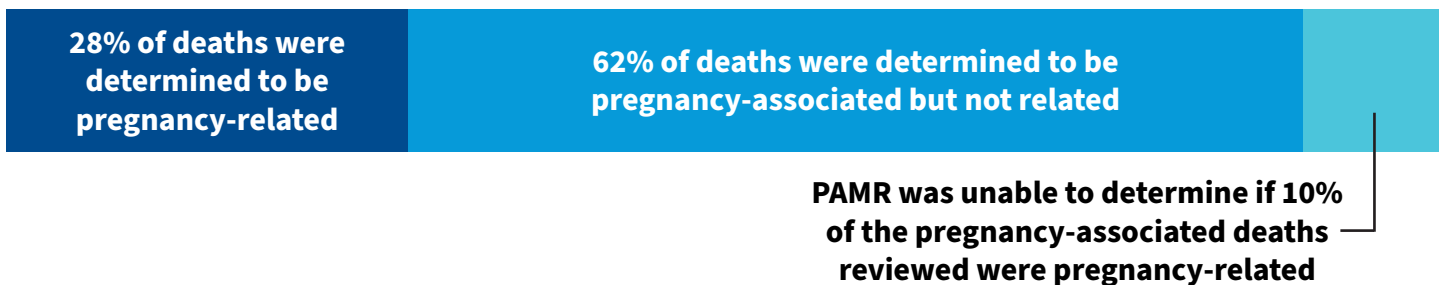
## PREGNANCY-RELATED DEATHS

There was a total of 130 pregnancy-associated deaths in 2020. The committee reviewed 127 of those deaths, as three deaths were tabled due to ongoing investigations and thus were unable to be reviewed by the committee.

Of the 127 pregnancy-associated deaths that were reviewed by PAMR:

- 28% (n=35) were determined to be pregnancy-related. Pregnancy-related deaths are those deaths determined by PAMR to be directly related to or aggravated by pregnancy or its management (Figure 1). This report will focus on findings from the review of pregnancy-related deaths that occurred during 2020 in Ohio. Expanded definitions of pregnancy-relatedness are included in the Definitions section of the report on page 5.

**Figure 1. Over 1/4 of Pregnancy-Associated Deaths That Occurred in Ohio in 2020 Were Pregnancy-Related (n=127)**



The breakdown of pregnancy-associated deaths by relatedness among deaths that occurred in 2020 is consistent with the previously released reports.

## RACIAL DISPARITIES IN PREGNANCY-RELATED DEATHS

Among the 35 pregnancy-related deaths in Ohio in 2020, 68% (n=24) were to non-Hispanic White women, 26% (n=9) were to non-Hispanic Black women, and 6% (n=2) were to Hispanic women or non-Hispanic women of a race other than Black or White (Table 2 in Appendix B). Historically in Ohio, from 2008-2016, non-Hispanic Black women were more than 2.5 times more likely to die from pregnancy-related causes than non-Hispanic White women (Ohio Department of Health, 2019).

In Ohio’s most recent report: “A Report on Pregnancy-Related Deaths in Ohio, 2017-2018,” PAMR adopted new criteria adapted from the Utah Department of Health Perinatal Mortality Review (Smid et al., 2020) to determine the pregnancy-relatedness of unintentional overdose deaths and deaths due to suicide. Additional information about the criteria and evaluation of their use can be found in the “Consensus pregnancy-related criteria for suicide and unintentional overdoses using a Delphi process” by the Utah Maternal Mortality Review and CDC Maternal Mortality Prevention Team partners published in the Archives of Women’s Mental Health (Smid et al., 2024). PAMR has continued to use these criteria in the review of 2020 deaths. An increased number of unintentional overdose deaths have been determined to be pregnancy-related since adoption of these criteria (Appendix B). The entirety of pregnancy-related overdose deaths occurred among non-Hispanic White women in 2020. In previous years, the majority of pregnancy-related overdose deaths occurred among non-Hispanic White women (2017-2018). However, pregnancy-related deaths due to causes other than overdose occurred disproportionately among non-Hispanic Black women. Pregnancy-related deaths disproportionately impact non-Hispanic Black women across the country (CDC, 2023a). Despite this change in methodology that now considers deaths due to overdose, Non-Hispanic Black women are still overrepresented among pregnancy-related deaths in Ohio. In 2020 non-Hispanic Black women were 1.5 times more likely to die from pregnancy-related causes than non-Hispanic White women (Figure 2).

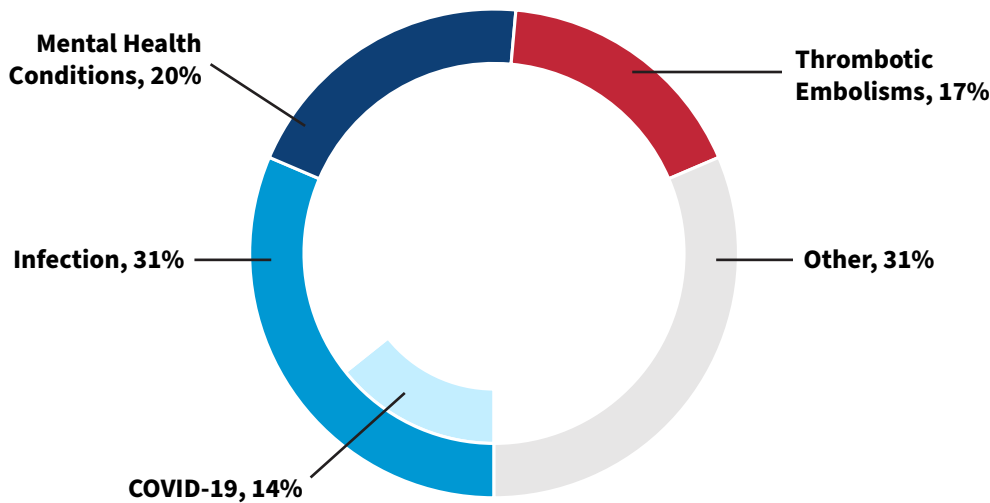
**Figure 2. In 2020 non-Hispanic Black women Were 1.5 Times More Likely to Die from Pregnancy-Related Causes than Non-Hispanic White Women**



# LEADING CAUSES OF PREGNANCY-RELATED DEATHS

Nearly one-third (31%, n=11) of all pregnancy-related deaths in 2020 were due to infection. This included postpartum genital tract infections, urinary tract infections, sepsis/septic shock, and COVID-19. One-fifth (20%, n=7) of deaths were due to mental health conditions which included depressive disorders and substance use disorders, all of which were due to overdose in 2020. Thrombotic embolisms accounted for 17% (n=6) of pregnancy-related deaths in 2020. The final third of all pregnancy-related deaths (31%, n=11) were due to: cardiovascular conditions, injury, cardiomyopathy, collagen vascular/autoimmune diseases, hematologic conditions, hemorrhage, and hypertensive disorders of pregnancy (Figure 3). A complete breakdown of pregnancy-related deaths causes can be found in Appendix B.

**Figure 3. Of the 35 Pregnancy-Related Deaths that Occurred in Ohio in 2020, Infection was the Leading Cause of Death**



<p><b>Nearly one-third (31%) of all pregnancy-related deaths in 2020 were due to infection, including:</b></p> <ul style="list-style-type: none"> <li>• Postpartum genital tract infections</li> <li>• Urinary tract infections</li> <li>• Sepsis/septic shock</li> <li>• COVID-19</li> </ul>	<p><b>Nearly one-third of (31%) of all pregnancy-related deaths in 2020 were due to causes other than infection, mental health conditions or embolisms.</b></p> <ul style="list-style-type: none"> <li>• 11% were due to cardiovascular conditions</li> <li>• 6% were due to injury</li> <li>• 3% were due to cardiomyopathy</li> <li>• 3% were due to collagen vascular/autoimmune diseases</li> <li>• 3% were due to hematologic conditions</li> <li>• 3% were due to hemorrhage</li> <li>• 3% were due to hypertensive disorders of pregnancy</li> </ul>
<p><b>One-fifth (20%) of all pregnancy-related deaths in 2020 were due to mental health conditions, including overdoses related to:</b></p> <ul style="list-style-type: none"> <li>• Depressive disorders</li> <li>• Substance use disorder</li> </ul>	
<p><b>Nearly one-fifth (17%) of all pregnancy-related deaths in 2020 were due to thrombotic embolisms.</b></p>	



# COVID-19

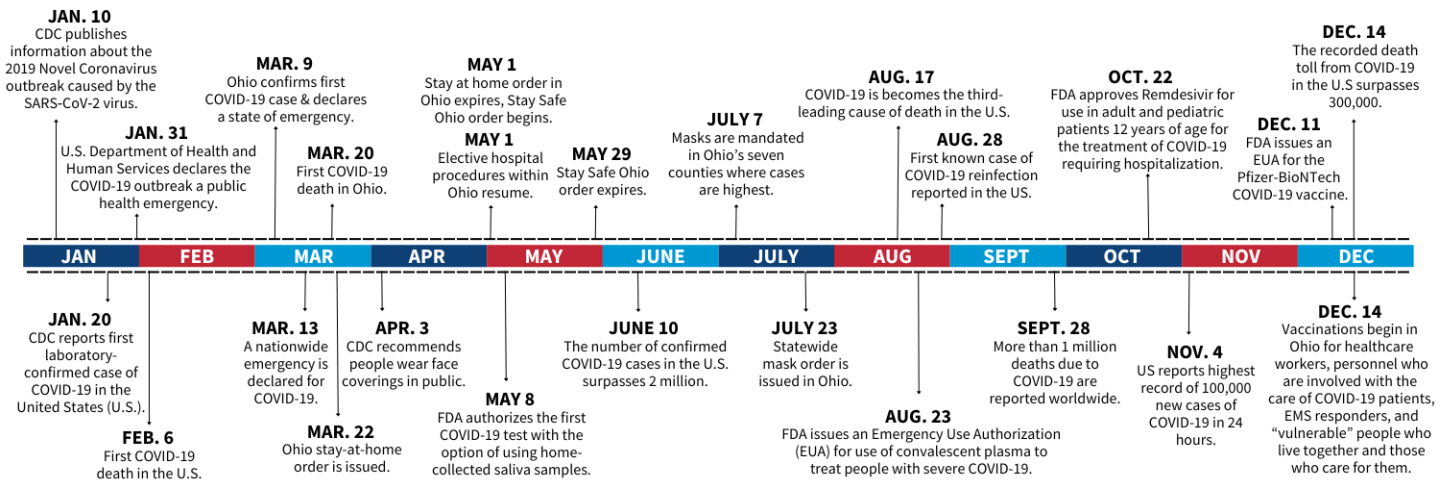
The COVID-19 pandemic had devastating impacts to health and well-being around the world. In 2020, five pregnancy-related deaths were directly caused by COVID-19 infections in Ohio. While this number may seem small, PAMR recognizes the indirect impacts COVID-19 had on the maternal health landscape. Additionally, the availability of testing for COVID-19 may have impacted the number of deaths identified with COVID-19 as a contributing factor or cause of death in 2020. PAMR recognizes this limitation in the data around deaths due to COVID-19 presented in this report. National data suggests that COVID-19 had significant impacts on maternal deaths across the United States, which is the death of a woman from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth, or within 42 days of the end of pregnancy, irrespective of the duration and site of pregnancy (U.S. GAO, 2022). Pregnant women and those who had recently been pregnant are at increased risk for severe illness and death due to COVID-19 compared to those who are not pregnant or recently pregnant (Zambrano et al., 2020). Below is a timeline of pivotal markers of the COVID-19 pandemic throughout 2020. A similar timeline of COVID-19 policies, practices, and available treatments was provided to PAMR committee members to assist in their review of 2020 deaths. This timeline informed not only the review of deaths due to COVID-19, but also how COVID-19 influenced social determinants of health and medical system capacity.

## 2020 COVID-19 Timeline

- **JAN. 10** - CDC publishes information about the 2019 Novel Coronavirus outbreak caused by the SARS-CoV-2 virus.
- **JAN. 20** - CDC reports first laboratory - confirmed case of COVID-19 in the United States (U.S.)
- **JAN. 31** - U.S. Department of Health and Human Services declares the COVID-19 outbreak a public health emergency.
- **FEB. 6** - First COVID-19 death in the U.S.
- **MAR. 9** - Ohio confirms first COVID-19 case and declares a state of emergency.
- **MAR. 13** - A nationwide emergency is declared for COVID-19.
- **MAR. 20** - First COVID-19 death in Ohio.
- **MAR. 22** - Ohio stay-at-home order is issued.
- **APR. 3** - CDC recommends people wear face coverings in public.
- **MAY 1** - Stay at home order in Ohio expires, Stay Safe Ohio order begins. - Elective hospital procedures within Ohio resume.
- **MAY 8** - FDA authorizes the first COVID-19 test with the option of using home-collected saliva samples.
- **MAY 29** - Stay Safe Ohio order expires.
- **JUNE 10** - The number of confirmed COVID-19 cases in the U.S. surpasses 2 million.
- **JULY 7** - Masks are mandated in Ohio's seven counties where cases are highest.
- **JULY 23** - Statewide mask order is issued in Ohio.
- **AUG. 17** - COVID-19 becomes the third-leading cause of death in the U.S.
- **AUG. 23** - FDA issues an Emergency Use Authorization (EUA) for use of convalescent plasma to treat people with severe COVID-19.
- **AUG. 28** - First known case of COVID-19 reinfection reported in the U.S.
- **SEPT. 28** - More than 1 million deaths due to COVID-19 are reported worldwide.
- **OCT. 22** - FDA approves Remdesivir for use in adult and pediatric patients 12 years of age for the treatment of COVID-19 requiring hospitalization.
- **NOV. 4** - U.S. reports highest record of 100,000 new cases of COVID-19 in 24 hours.
- **DEC. 11** - FDA issues an EUA for the Pfizer-BioNTech COVID-19 vaccine.
- **DEC. 14** - The recorded death toll from COVID-19 in the U.S. surpasses 300,000. - Vaccinations begin in Ohio for healthcare workers, personnel who are involved with the care of COVID-19 patients, EMA responders, and "vulnerable" people who live together and those who care for them.

Source: (AJMC Staff, 2021), (CDC, 2023b), (Ideastream Public Media, n.d.)

Ohio COVID data can be found here: <https://data.ohio.gov/wps/portal/gov/data/view/covid-19-reporting>

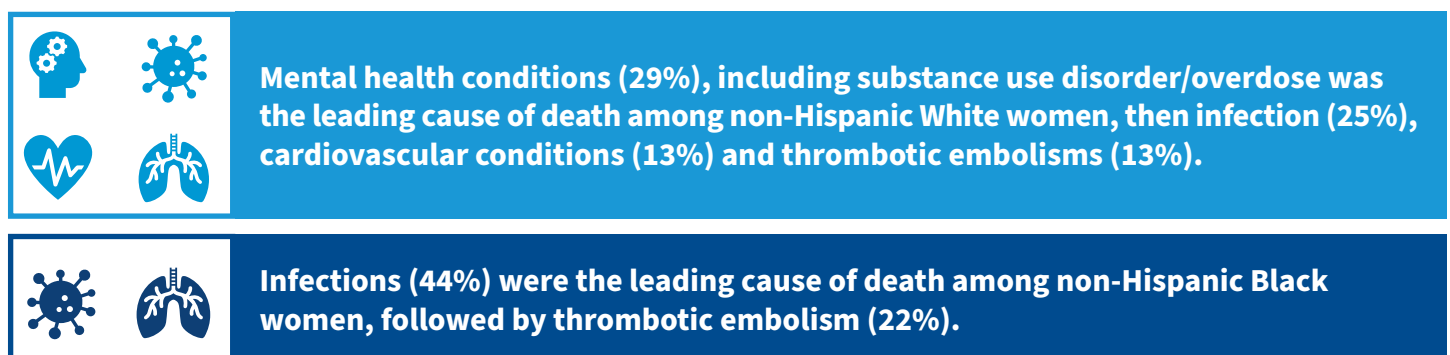


Infection was the leading cause of pregnancy-related death in 2020. Per CDC guidance and classification of causes of death, COVID-19 is included in the infection cause of death category. Please see page 30 in Appendix C for the full list of underlying causes of death that are included in the infection cause of death category. Infection has been the second leading cause of pregnancy-related deaths in the past; 13% from 2008-2016 and 11% from 2017-2018, (Ohio Department of Health, 2019) (Ohio Department of Health, 2023). However, COVID-19 impacted the number of pregnancy-related deaths due to infection in 2020. Of the 31% of pregnancy related deaths due to infection in 2020, 14% of those infection deaths were due to COVID-19. Vaccines for COVID-19 were either not available or not widely distributed at the time of death for all women who died of pregnancy-related deaths due to COVID-19 in 2020.

## LEADING CAUSES OF DEATH BY RACE/ETHNICITY

The leading causes of pregnancy-related deaths among non-Hispanic White women differed from those among non-Hispanic Black women and women of a race other than Black or White in 2020 (Figure 4). The leading causes of pregnancy-related deaths to Non-Hispanic White women included mental health conditions (29%), infection (25%), cardiovascular conditions (13%), and thrombotic embolisms (13%). For non-Hispanic Black women, leading causes of pregnancy-related deaths included infection (44%) and thrombotic embolisms (22%). Leading causes of death for women of a race other than Black or White were evenly distributed between infection and thrombotic embolism.

**Figure 4. Leading Causes of Pregnancy-Related Deaths by Race/Ethnicity in Ohio in 2020**



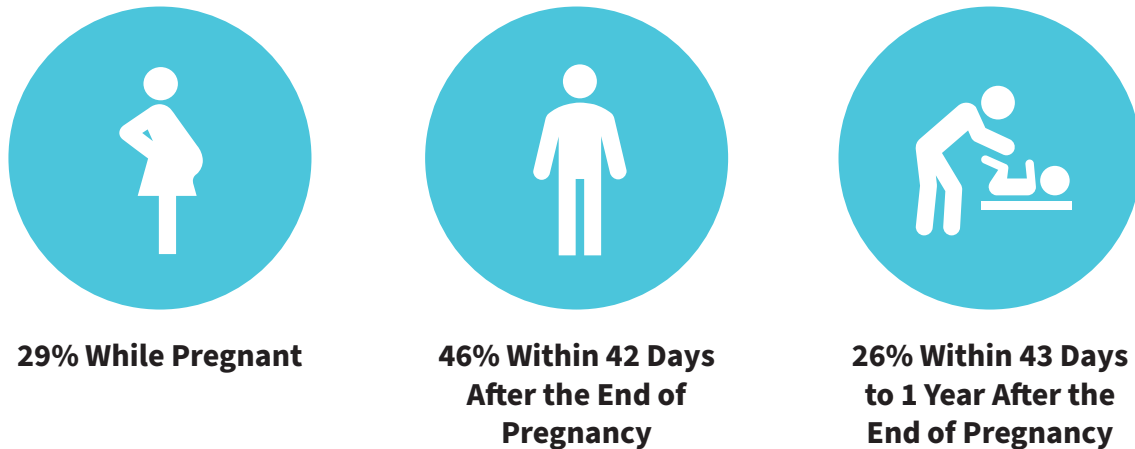
*Mental Health Conditions in 2020 included depression and substance use disorder. Infection causes of death in 2020 include postpartum genital tract infections, urinary tract infections, sepsis/septic shock, and COVID-19.*

*Note leading causes of death for Hispanic and non-Hispanic women of other races are not displayed to protect the identity of decedents.*

## TIMING OF PREGNANCY-RELATED DEATH

Among the 35 pregnancy-related deaths that occurred in 2020, 29% occurred while pregnant, 46% occurred within 42 days after the end of pregnancy, and 26% occurred within 43 days to 1 year after the end of pregnancy. The majority of pregnancy-related deaths in 2020 occurred in the immediate post-partum period within 42 days of the end of pregnancy (Figure 5).

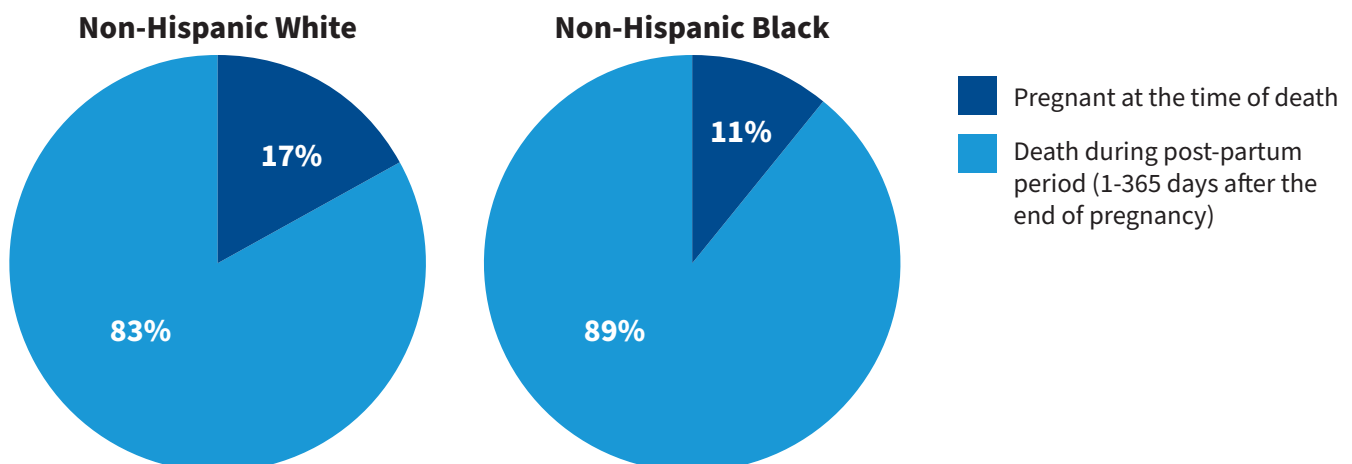
**Figure 5. Most Pregnancy-Related Deaths Occurred in the Postpartum Period in 2020**



## TIMING OF PREGNANCY-RELATED DEATH BY RACE/ETHNICITY

The postpartum period (1-365 days after the end of pregnancy) was the most common timing of pregnancy-related deaths regardless of race/ethnicity. The majority of pregnancy-related deaths to non-Hispanic White and non-Hispanic Black women occurred within one year after the end of pregnancy, with the minority occurring during pregnancy (Figure 6). Timing of death among Hispanic women and non-Hispanic women of a race other than Black or White was evenly distributed between pregnancy and the postpartum period.

**Figure 6. Timing of Pregnancy-Related Death by Race/Ethnicity in 2020 in Ohio**

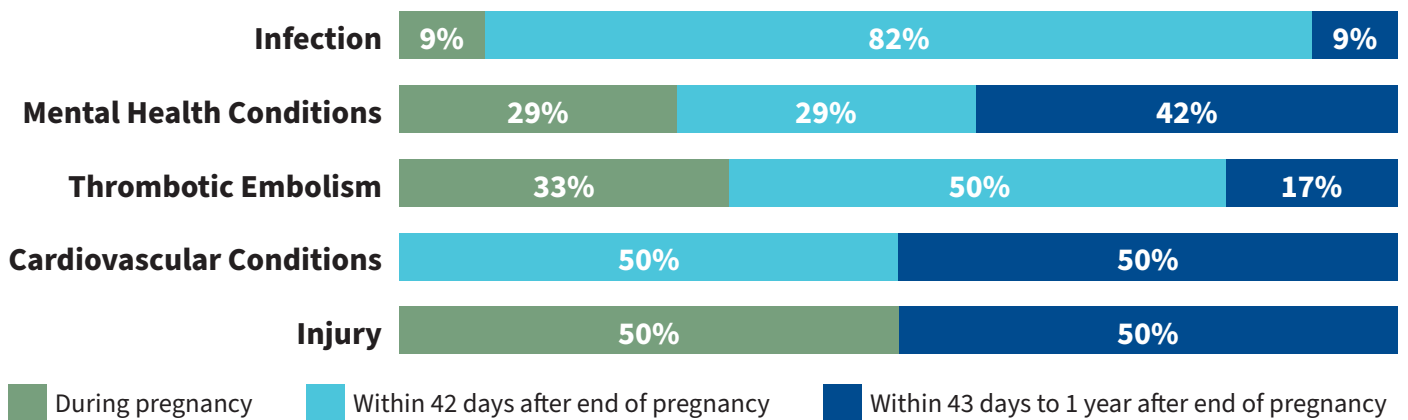


Please note timing of death for Hispanic and non-Hispanic women of other races is not displayed to protect identity of decedents.

## LEADING CAUSE OF DEATH VARIED BY TIMING

The timing of pregnancy-related death varied by leading causes of death in 2020. Timing of death is separated into three time-frames: pregnant at the time of death, death within 42 days after the end of pregnancy, and death within 43 days to 1 year after the end of pregnancy. Among pregnancy-related deaths due to infection, 9% occurred during pregnancy, 82% occurred within 42 days after the end of pregnancy, and 9% occurred within 43 days to 1 year after the end of pregnancy. Among pregnancy-related deaths due to mental health conditions, 29% occurred during pregnancy, 29% occurred within 42 days after the end of pregnancy, and 42% occurred within 43 days to 1 year after the end of pregnancy. Among pregnancy-related deaths due to thrombotic embolisms, 33% occurred during pregnancy, 50% occurred within 42 days after the end of pregnancy, and 17% occurred within 43 days to 1 year after the end of pregnancy. Pregnancy-related deaths due to cardiovascular conditions were evenly distributed between 42 days after the end of pregnancy (50%) and 43 days to 1 year after the end of pregnancy (50%). Finally, pregnancy-related deaths due to injury were evenly distributed between 42 days after the end of pregnancy (50%) and 43 days to 1 year after the end of pregnancy (50%). Figure 7 displays the timing of death by leading causes of pregnancy related death and does not reflect all pregnancy-related deaths in 2020.

**Figure 7. Timing of Death Varied by Leading Causes of \*Pregnancy-Related Death**



\*Total number of pregnancy-related deaths not reflected for leading causes of death.

## PREVENTABILITY OF PREGNANCY-RELATED DEATHS

The PAMR committee reviews all available information for each pregnancy-related death and determines whether each death was preventable. 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. Among the 35 pregnancy-related deaths that occurred in 2020, the committee deemed 66% (n=23) to be preventable (Figure 8).

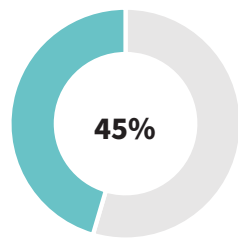
**Figure 8. Most Pregnancy-Related Deaths that Occurred in Ohio in 2020 were Preventable**



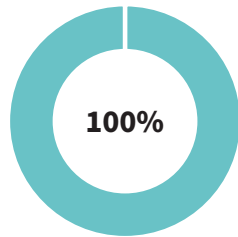
# PREVENTABILITY OF PREGNANCY-RELATED DEATHS, BY CAUSE OF DEATH

Of the leading causes of pregnancy-related deaths that occurred in 2020, 45% of deaths due to infection were deemed preventable, 100% of deaths due to mental health conditions were deemed preventable, 50% of deaths due to thrombotic embolism were deemed preventable, 50% of deaths due to cardiovascular conditions were deemed preventable, and 100% of deaths due to injury were deemed preventable (Figure 9).

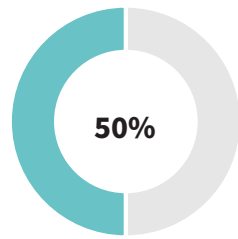
**Figure 9. Preventability Varied Among Leading Causes of Pregnancy-Related Deaths in 2020**



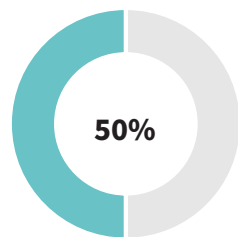
**45%**  
of deaths due to infection were deemed preventable.



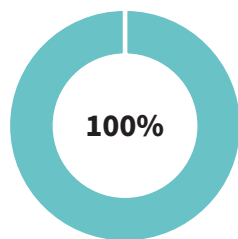
**100%**  
of deaths due to mental health conditions were deemed preventable.



**50%**  
of deaths due to thrombotic embolism were deemed preventable.



**50%**  
of deaths due to cardiovascular conditions were deemed preventable.



**100%**  
of deaths due to injury were deemed preventable.

## **CONTRIBUTING FACTORS TO PREGNANCY-RELATED DEATHS**

Part of the review process includes identification of contributing factors or factors that, if altered, could have prevented the death from occurring. The purpose of identifying contributing factors is to acknowledge and elevate the impact both clinical and non-clinical determinants of health can have on maternal health outcomes. Contributing factors can include a wide range of experiences that the decedent encountered prior to their death. Unstable housing, lack of care coordination, loss of insurance, chronic diseases, traumatic childhood experiences, misdiagnosis, and lack of referral to substance use treatment are all types of contributing factors that have been identified among pregnancy-related deaths in the past. Appendix C of this report includes the Committee Decision Form, which the PAMR committee uses to standardize review of each death and includes a complete list of the contributing factor classifications.

There was a total of 88 contributing factors identified across the 23 preventable pregnancy-related deaths in 2020. On average, about four contributing factors were identified for each preventable pregnancy-related death. About three quarters (77%) of contributing factors fell within the five classifications described below.

### ***Inadequate Assessment of Risk***

Inadequate assessment of risk was the most identified factor that contributed to pregnancy-related deaths in 2020. Failure to screen/inadequate assessment of risk most often referred to healthcare providers not screening patients for substance use disorder, mental health conditions, including postpartum depression, domestic or intimate partner violence, as well as inadequate assessment of risk for other leading causes of pregnancy-related death (sepsis, hemorrhage, and hypertensive disorders). The lack of screening/assessment of risk subsequently contributed to morbidity and mortality among decedents.

### ***Lack of Care Coordination/Continuity of Care***

Continuity of care refers to (a) effective communication and organized coordination between prenatal, labor and delivery, and postpartum providers; and (b) both clinical care providers and non-clinical care providers, such as social services. Contributing factors related to lack of care coordination/continuity of care were identified most among decedents with inadequate pre- and postnatal care, substance use disorder, and follow up for mental health and substance use disorder treatment.

### ***Lack of Knowledge***

Among deaths where lack of knowledge was a contributing factor, lack of knowledge was most often in reference to a provider, support person (e.g., spouse, grandparents, siblings), or the decedent not receiving adequate education or lacking understanding of a health event (e.g., shortness of breath as a trigger to seek immediate care). Additionally, lack of knowledge for appropriate treatment for pregnant patients with COVID-19 was identified as a significant contributing factor.

### ***Lack of Access/Financial Resources***

Lack of access to necessary health services including care and medications presented significant barriers to decedents. Additionally, a lack of geographically accessible and timely access to needed care services, such as substance use treatment facilities and mental health care providers, was another way that systemic barriers contributed to pregnancy-related deaths.

### ***Clinical Skill/Quality of Care***

Lack of clinical skills among healthcare providers resulted in lower quality of care among decedents. This included healthcare providers not being appropriately trained/skilled for the situation, or not exercising clinical judgment consistent with standards of care. Most factors related to lack of clinical skill were related to healthcare providers not practicing standards of care for pregnant patients with substance use disorder.

## PAMR RECOMMENDATIONS, BY CONTRIBUTING FACTORS

Once the committee identifies contributing factors, recommendations are made to address those factors to prevent future deaths from occurring. Pregnancy-related deaths are the result of the convergence of clinical, social, systemic, community, interpersonal, and individual factors a decedent experiences throughout their life and leading up to their death. To prevent future pregnancy-related deaths, the PAMR committee strives to acknowledge the impact of these factors on maternal health outcomes by crafting specific, actionable recommendations.

The PAMR committee made recommendations for preventing future maternal deaths based on the contributing factors of pregnancy-related deaths in 2020. Not all contributing factors have recommendations at all levels, depending on the nature of these deaths and the perceived opportunities for prevention.

Following is a summary of these recommendations as they relate to the most common categories of contributing factors. They acknowledge the need for a multidisciplinary approach and various levels of action to make improvements in maternal health outcomes in Ohio, including patient/family, provider, facility, system, and community levels.

To address **inadequate assessment of risk**:

Systems of care should:	Providers should:
Systems of care should provide annual education on the best practices and importance of screening for depression both during and after pregnancy, including how and where to make referrals if there is a positive screen. Care coordinators should be utilized to ensure adherence/continuity.	Providers should perform evidence-based screenings for adverse childhood experiences (ACEs) and any signs of trauma or chronic abuse during the patient’s first prenatal intake visit and at the patient’s postpartum appointment. In addition, these screenings should occur at least once per trimester, or when any signs of abuse are presented.
Systems of care, including the State Health Department and hospital systems, should imminently implement policies/procedures to make sure that patients are appropriately evaluated for high risk of venous thromboembolism and treated if necessary.	Providers should routinely screen all patients for depression, substance use, and domestic violence during prenatal care and appropriate referrals should be made pending the results of those screenings.
Systems should provide case management for high-risk pregnant patients at entry to care, especially those who are insured by Medicaid.	Continuing medical education for obstetricians should imminently prioritize education in leading causes of pregnancy-related deaths, in particular cardiac causes and contraindications to pregnancy, and indications for maternal fetal medicine consultation.

To address **care coordination/continuity of care:**

<b>Communities should:</b>	<b>Systems of care should:</b>	<b>Facilities should:</b>	<b>Providers should:</b>
Communities should establish systems allowing local healthcare facilities to easily share electronic medical records with each other as soon as possible.	To facilitate a collaborative team, systems of care should incorporate the use of a care navigator when working with patients who present with multiple comorbidities.	When providers have patients with high-risk pregnancy histories, they should assign/order case management/home services in the postpartum period and follow up frequently.	Care coordinators/providers should be contacting patients when they miss appointments to reschedule, ensure they attend appointments, and place appointments for referrals throughout their course of care.

To address **lack of knowledge:**

<b>Systems of care should:</b>	<b>Facilities should:</b>	<b>Providers should:</b>
Public health systems should focus community education on the impacts of high prevalence diagnoses (i.e. diabetes, chronic hypertension) on pregnancy.	Facilities should have policies in place where providers must educate all pregnant and postpartum patients and families about Urgent Maternal Warning Signs. Providers must explain who to call for concerns, what is not normal, and when to seek care, especially for patients at risk for unrecognized hemorrhage.	Healthcare staff, such as nurses or providers, should instruct all pregnant and postpartum patients and support persons about Urgent Maternal Warning Signs such as the Association of Women’s Health, Obstetric, and Neonatal (AWHONN) warning signs, verbally, through video, and printed on the discharge instructions. This discussion should reinforce the mother and support person’s understanding of when to contact her provider and/or seek care.

To address **lack of access/financial resources:**

<b>Communities should:</b>	<b>Systems of care should:</b>	<b>Facilities should:</b>
Systems and communities should routinely work together to ensure resources are available to pregnant or postpartum patients after incarceration, especially those living with substance use disorder.	Systems of care should provide integrated care models including services (addiction, mental health, OBGYN) at the same location to treat addiction/substance use disorder/mental health for patients throughout pregnancy and the post-partum period.	When patients communicate difficulties with adhering to care guidelines due to financial/access issues, facilities should connect patients with social services to identify barriers to accessing health care and possible solutions to barriers.



To address **clinical skill and quality care**:

<b>Systems of care should:</b>	<b>Facilities should:</b>	<b>Providers should:</b>
Systems of care should require education for providers on best practices for managing pain with patients with history of substance use/substance use disorder.	Facilities and free-standing birth centers should regularly provide education about appropriate postpartum hemorrhage management to providers.	Providers should provide education and addiction medicine referrals (as needed) for postpartum patients struggling with pain management with a history of substance use.

## DATA-TO-ACTION

In 2019, The Ohio Department of Health (ODH) was awarded the State Maternal Health Innovation Grant by the Health Resources and Services Administration (HRSA) to plan and implement innovative projects to address maternal health and maternal mortality. ODH was also awarded the Enhancing Review and Surveillance to Eliminate Maternal Mortality (ERASE MM) grant in 2019 by the CDC, to bolster both the surveillance and data to action efforts of the PAMR program. The projects funded by both grants were, and continue to be, informed by PAMR data and recommendations. At the time ODH applied for funding, these projects were based on aggregated pregnancy-related death data from 2008-2016. The data-to-action efforts listed below are currently being implemented:

### ***Alliance for Innovation on Maternal Health (AIM) Patient Safety Bundles***

In 2020, ODH partnered with the Ohio Hospital Association to join AIM. This program works through state teams, hospitals, and health systems to align national, state, and hospital level quality improvement efforts. This quality improvement project was created by the American College of Obstetricians and Gynecologists to support and measure best practices within hospitals to make birth safer and reduce preventable maternal deaths and severe maternal morbidity.

ODH is currently implementing two AIM patient safety bundles with the support of the Ohio Colleges of Medicine Government Resource Center: The Severe Hypertension in Pregnancy bundle and the Obstetric Hemorrhage bundle. Thus far, over 82 birthing hospitals out of 93 birthing hospitals in Ohio (88%) have participated in the Hypertension bundle over the course of three (out of three) waves, and 45 birthing hospitals (48%) have participated in the Hemorrhage bundle over the course of two (out of three) waves. One more wave will be implemented.

### ***Virtual Obstetric Emergency Simulation Trainings for Emergency Medicine Providers***

In 2020, ODH funded a project through The Ohio State University’s Clinical Skills Education and Assessment Center to provide simulation trainings to emergency medicine physicians, advanced practice providers, nurses, and first responders to increase their knowledge and preparedness to recognize and treat common obstetric emergencies.

Since the first training for this project in August of 2020, 356 providers have participated in 31 trainings. Pre and post tests taken during the training sessions have shown significant increases in participants’ knowledge of obstetric emergencies, self-confidence performing obstetric emergency related skills, and self-confidence managing specific obstetric emergencies cases.

## ***Urgent Maternal Warning Signs***

Educating moms on recognizing prenatal and postpartum warning signs has the potential to prevent severe complications and save lives. Using the Urgent Maternal Warning Signs (UMWS) education developed by the Council on Patient Safety and AIM, ODH is funding a project to teach providers, moms and communities about severe symptoms that can occur during pregnancy or in the postpartum period that should not be ignored. This education is being provided in non-clinical settings, such as WIC clinics and Home Visiting programs, and via a media campaign to reach a wider audience of moms.

The first two waves of the Urgent Maternal Warning Signs project occurred in WIC clinics. During wave one, 95% of clients received written/verbal education on the UMWS. Across waves one and two, 97% of WIC clinics in Ohio participated in the project. Starting in October of 2020, Ohio WIC added provision of the UMWS education as part of their quarterly SMART goals. Wave three began in October 2022 and consists of 28 participating evidence-based home visiting sites.

## ***Ohio Council to Advance Maternal Health***

The Ohio Council to Advance Maternal Health (OH-CAMH) is Ohio's statewide, member driven maternal health task force. This task force exists to help further PAMR recommendations and maternal health work within the state. OH-CAMH consists of stakeholders from a variety of organizations throughout Ohio who have come together to identify and address gaps and needs in Ohio's maternal health care landscape. For more information on OH-CAMH and how to get involved, please visit <https://childrenandyouth.ohio.gov/for-providers/maternal-infant-clinical-initiatives/oh-council-advance-maternal-health>

## ***Disparities in Maternal Health Community Grant***

The Disparities in Maternal Health Community Grant program is part of ODH's data to action efforts that focus on the implementation of strategies aimed at addressing health equity in populations that experience the greatest disparities in maternal mortality and morbidity. In Ohio, Black women are disproportionately impacted by adverse maternal health outcomes. To work toward eliminating disparities in maternal health among Black women, this grant program asks that grantees implement public health programming through an intersectional and socioecological lens. Projects that have been selected for this grant range from nutritional and lactation counseling to at-home blood pressure monitoring programs, to supporting behavioral health services for expectant women and families. Past and present recipients of the Disparities in Maternal Health Community Grant include: The Ohio State University, The Cleveland Clinic Foundation, CelebrateOne, Public Health – Dayton and Montgomery County, Community Action Organization of Scioto County Inc., Breastfeeding Outreach for our Beautiful Sisters, Birthing Beautiful Communities, Hospital Council of Northwest Ohio, and Summit County Public Health. For more information about the Disparities in Maternal Health Community Grant, please visit <https://childrenandyouth.ohio.gov/for-providers/maternal-infant-clinical-initiatives/data-action-projects>

# APPENDIX A. PAMR PROCESS

## *History of PAMR in Ohio*

The Ohio Pregnancy-Associated Mortality Review (PAMR) was established in 2010 to identify and review all pregnancy-associated deaths in Ohio, with the goal of developing effective interventions to reduce maternal mortality. Prior to 2010, a maternal death review was operated by ODH and the Ohio State Medical Association in the late 1970s and early 1980s. In 2009, a variety of factors prompted medical and public health professionals to explore re-establishing a statewide PAMR.

In 2010, ODH successfully competed for funding from the Agency for Healthcare Research and Quality (AHRQ) for a one-year patient safety planning grant to develop Ohio PAMR, which resulted in the program initiation. The grant required the development of the program and the review of one year of cases within that year. Funding after the first year came from the Maternal and Child Health Block Grant through ODH. The initial review process framework was adapted from the CDC publication, *Strategies to Reduce Pregnancy-Related Deaths*, along with technical assistance from CDC's Division of Reproductive Health, and states with fully functional PAMR systems (Atrash et al., 2001). The review process and forms were refined by PAMR staff and members over time, in collaboration with federal partners. Ohio participated in the first cohort for the Every Mother Initiative through the Association of Maternal and Child Health Programs (AMCHP) and funded by Merk for Mothers in 2013 (Shellhaas & Conrey, 2018). As part of this cohort Ohio beta tested the precursor the CDC's Maternal Mortality Review Information Application (MMRIA) and was also the recipient of funds to pilot the initial simulation trainings that would become the Virtual Obstetric Emergency Simulation Trainings project. In 2019 the PAMR program at the Ohio Department of Health was awarded the Enhancing Review and Surveillance to Eliminate Maternal Mortality (ERASE MM) grant, a five-year cooperative agreement from the CDC, to bolster both the surveillance and data to action efforts of the PAMR program. Additionally, in 2019 PAMR was codified in [Ohio Revised Code Section 3738.08](#).

## *Identification of Cases and Case Abstraction*

Each year, PAMR cases are identified by the ODH Bureau of Vital Statistics (VS) using the pregnancy checkbox on the death certificate, ICD-9-CM (prior to 2016) or ICD-10 obstetric cause of death codes, and linkage to live birth or fetal death certificates. Deaths must meet the following criteria to be reviewed:

- The death must be pregnancy-associated. Pregnancy-associated is defined as the death of a woman while pregnant or anytime within one year of pregnancy, regardless of cause.
- The decedent must be an Ohio resident.
- The death must have occurred in Ohio.

Deaths are first identified by ODH vital statistics staff from the pregnancy checkbox on the death certificate and/or the use of diagnostic O-codes, for the cause of death. Deaths from 2008 through 2015 were identified after a two-year lag, then beginning with 2016 deaths, after only a one-year lag. For the first three years, this was the only way deaths were identified.

In 2011, linkage was added, identifying about 15 to 20 additional deaths per year. This process was done retrospectively to identify any missed cases from 2008 through 2010 and has been routine since. Through the linkage, the woman's death certificate is matched to a corresponding live birth or fetal death certificate when applicable, (fetal deaths are only registered in Ohio at or above 20 weeks gestation). For maternal death certificates that cannot be linked, further investigation occurs to confirm that the pregnancy checkbox on the death certificate was not erroneously marked. For cases where there is concern for a possible error, the certifier is contacted for confirmation. A full list of deaths is usually available to PAMR staff by the spring of the following year.

Relevant records are then requested via a letter signed by a designee of the ODH Director of Health and may include primary health care provider records; prenatal care records; hospitalizations (labor and delivery and other); emergency medical services records; medical examiner files including autopsy, toxicology, and related investigative reports; social services and mental health records; fire marshal and law enforcement reports. Legal authority for data requests is provided by Ohio Revised Code 3738.05, which states that “an individual, government entity, agency that provides services specifically to individuals or families, law enforcement agency, health care provider, or other public or private entity that provided services to a woman whose death is being reviewed by the PAMR board shall submit to the board a copy of any record it possesses that the board requests. In addition, such an individual or entity may make available to the board additional information, documents, or reports that could be useful to the board’s investigation.”

Before a review can be conducted, records must be requested and the time from request to receipt is highly variable. It can be extremely difficult to locate sources of information. In particular, the source of prenatal care provision is not always clear. The delivering provider, as listed on the birth certificate, is not always the prenatal care provider. When pregnancies are only identified at autopsy and there is no birth or fetal death certificate, a delivering provider is not available at all, decreasing the chances of obtaining any prenatal care records.

Records are abstracted by PAMR nurse abstractors who are registered nurses, using a standardized form. Cases are abstracted directly into a CDC-supported data system called the Maternal Mortality Review Information Application (MMRIA). Each abstraction takes an average of about 40 hours, depending on the complexity of the case and record format (e.g., hand-written, electronic, hybrid of both). Deidentified case summaries are distributed to PAMR members before the meeting.

In 2017, a decision was made to decrease the time lag from the occurrence of a death, and PAMR review of that death. During 2017-2018, deaths during both 2015 and 2016 were reviewed. Due to the number of cases for 2015 and 2016 combined, PAMR was unable to fully review all deaths. Therefore, the following criteria (see Box 1) were instituted to determine which pregnancy-associated deaths would be fully abstracted and receive a full review.

### **Box 1. Criteria Used for Deaths That Occurred During 2015-2016 to Determine Which Deaths Would Receive Full Abstraction and PAMR Review**

#### **Review all**

- Deaths determined by staff review to be potentially pregnancy-related.
- Drug overdose deaths during pregnancy.
- Suicide deaths during, or within six months of the end of pregnancy.
- Homicide deaths during pregnancy.

#### **Sampling of**

- Motor vehicle accident deaths during pregnancy, or within one year of pregnancy.
- Non-pregnancy-related cancer deaths within one year of the end of pregnancy.
- Homicide deaths within one year of the end of pregnancy.
- Drug overdose deaths within one year of the end of pregnancy.
- Non-pregnancy-related medical causes within one year of the end of pregnancy.
- Suicide deaths more than six months after end of pregnancy.

For deaths that occurred during 2015 or 2016 for which a full abstraction and review were not conducted, these limited data were abstracted into the data system by PAMR staff:

- PAMR ID
- Birth or Fetal Death Certificate information
- Death Certificate information
- Pregnancy-related: yes/no
- Pregnancy: During, within 1-42 days, with 43 days-one year
- If during pregnancy, gestational age at time of death
- Insurance: private, government, Medicaid, unknown

### ***PAMR Case Review Process***

Ohio's case review process was adapted from the CDC publication, *Strategies to Reduce Pregnancy-Related Deaths* (Atrash et al., 2001), and from the processes of other concurrently operating state maternal mortality review boards. Ohio's process utilizes both peer review and individual expertise while promoting reviewer engagement. Each member of the PAMR committee receives all case summaries approximately two weeks before the meeting; however, each case is assigned a primary and secondary reviewer who have specialized expertise in the type of case assigned and review the case in detail.

The PAMR committee historically has met at least three times per year but has recently increased its meeting frequency in order to review cases in a timelier manner. If enough committee members are available for the meeting, members are split into two teams and each team reviews a set of cases. The purpose is to maximize the number of cases reviewed per meeting and facilitate member engagement. During the review meeting, each team follows this format:

1. The primary reviewer provides a summary of the case including pertinent details from the abstraction, and highlights strengths and gaps in the available records.
2. The secondary reviewer provides additional comments.
3. All team members engage in a discussion, asking questions and providing answers from their specialty and review of the case.
4. The primary and secondary reviewers put forward their opinion on the following key questions:
  - Determination as pregnancy-related or not.
  - Assessment of case record completeness.
  - Determination of manner of death and the underlying cause of death (agree with death certificate or propose alternate).
  - The underlying cause of death is then classified per CDC's Pregnancy Mortality Surveillance System (PMSS) codes.
  - Opportunity to alter outcome (i.e., preventability).
  - Identification of contributing factors at the provider, facility or system, and patient/family levels.
  - Identification of factors, barriers, gaps, needs, and areas for improvement related to the course of events that led to the decedent's death.
5. All team members engage in group discussion and vote on each of the key questions.
6. All team members contribute to the creation of recommendations and action steps.

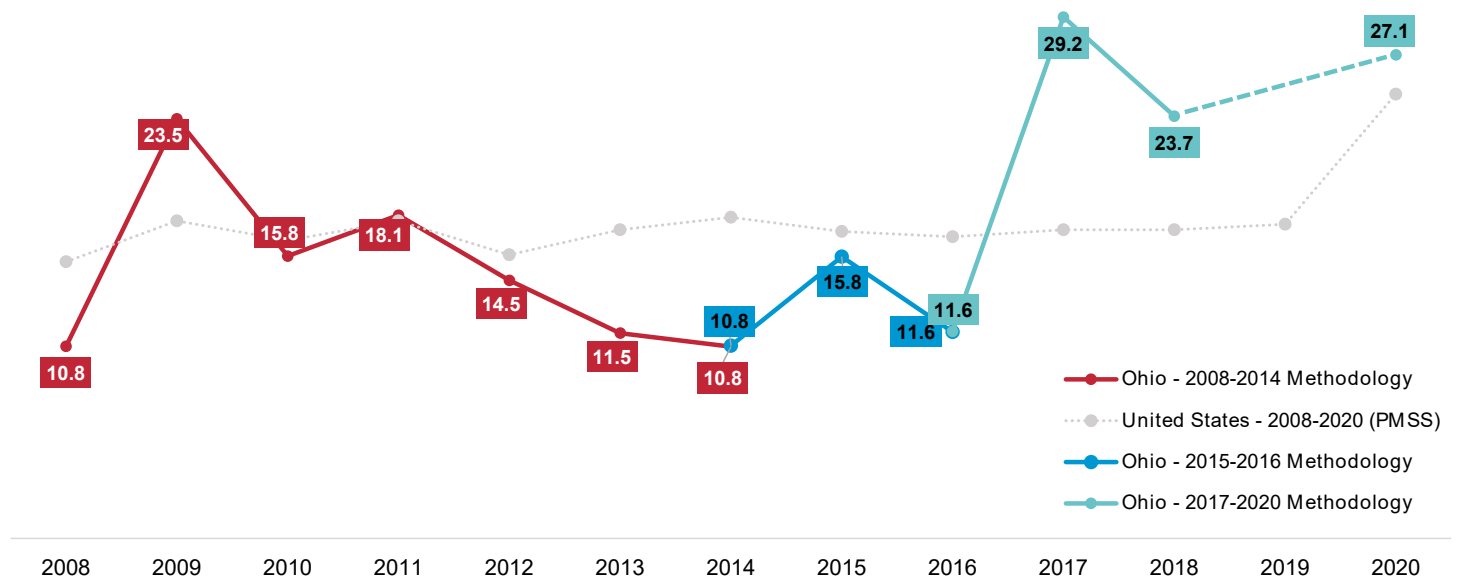
A committee decision form (CDF) is used to document the consensus of the committee in a standardized format for each case. The CDF is created and updated by the CDC. Please see the version of the CDF used to complete review of 2020 deaths in Appendix C. Each PAMR meeting opens with an overview of the review process, a reminder of definitions and confidentiality statements, presentation of any updates, and a moment of silence in recognition of the lives lost.

# APPENDIX B. PAMR DATA TRENDS, METHODOLOGY, UPDATES, AND SUPPLEMENTAL DATA

## Pregnancy-Related Mortality Trends

From 2008 to 2020, there were a total of 293 pregnancy-related deaths\* that occurred in Ohio. Figure 10 shows trends in pregnancy-related mortality ratios (PRMR) (the number of pregnancy-related deaths per 100,000 live births) in Ohio from 2008 through 2020. Throughout this time, PAMR has continuously worked to improve and refine the methodology used to review pregnancy-associated deaths. Figure 10 describes when PAMR methodology changed to aid in interpretation of the data.

**Figure 10. Pregnancy-Related Mortality Ratio Trends (Rate per 100,000 Live Births)**



\*This data does not include pregnancy-related deaths for 2019 as PAMR did not review deaths for 2019.

\*\*The Ohio PRMR shows a dotted line between 2018 and 2020 to indicate the missing data point for 2019.

**From 2008-2014, the review process was not specific enough to discern the contribution of mental health conditions and overdose to pregnancy-related deaths. Therefore, deaths due to these causes were classified as pregnancy-associated (but not related) and are not included in the figure. For additional information about 2008-2014 deaths, please refer to the [previously released 2008-2016 pregnancy-associated mortality data](#).**

**Deaths that occurred in 2015 and 2016 were reviewed simultaneously. Due to the number of cases for 2015 and 2016 combined, select criteria were used to determine which pregnancy-associated deaths would and would not be reviewed. See BOX 1 of Appendix A of this document for an overview of this review criteria.**

**The pregnancy-related mortality ratio more than doubled from 2016-2017 (Figure 10). This increase is a result of the adoption of new criteria adapted from the Utah Department of Health Perinatal Mortality Review to determine the pregnancy-relatedness of unintentional overdose deaths. Use of the new criteria resulted in an increased number of unintentional overdose deaths determined to be pregnancy-related in 2017-2018 and 2020.**

**Additionally, 2019 data is not displayed on this graphic. Due to COVID-19 pandemic and staffing challenges, review of pregnancy-associated deaths lagged from 2020-2022. Review of 2017 deaths was completed in January of 2021. Review of 2018 deaths began in late 2020 and was completed in January of 2022. To achieve more timely data, and prioritize the review of deaths related to COVID-19, ODH/DCY made the difficult decision not to review 2019 deaths. Vital Statistics data for 2019 deaths was still collected and will be used to examine pregnancy-associated trends over time.**

**United States and Ohio surveillance methods differ. Both methods include women who died during pregnancy or within one year of pregnancy. Maternal Mortality Review Committees (MMRCs) have access to multiple sources of information that can provide a deeper understanding of the circumstances surrounding a death than Pregnancy Mortality Surveillance System (PMSS) can offer. State and local MMRCs perform comprehensive reviews of deaths using information beyond what is available in vital records, including medical and non-medical data sources. MMRCs have the potential to get the most detailed, complete data on maternal mortality that then supports their ability to make specific recommendations for prevention. This also allows MMRCs to make determinations of pregnancy-relatedness on a broader set of deaths than is possible for PMSS, such as deaths due to injury. In contrast to the MMRC process, the U.S. process is based only on vital statistics data submitted to the CDC by states. More information on the U.S. system can be found at <https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm>.**

These changes in methodology over time are important to consider when interpreting and comparing data across time, especially when considering racial/ethnic disparities.

Table 1 describes the PRMRs for each of the respective time periods described above by race/ethnicity. A large increase in non-Hispanic White deaths is observed between 2015-2016 and 2017-2018. This increase is a result of the change in PAMR methodology implemented for 2017-2018 and 2020 deaths, which resulted in an increase in the number of overdose deaths determined to be pregnancy-related. About 95% of all overdose deaths were to non-Hispanic White women from 2017-2018 & 2020.

**Table 1. Pregnancy-Related Mortality Ratios, by Race/Ethnicity and Year, Ohio 2008-2014, 2015-2016, and 2017-2020\* (Deaths per 100,000 Live Births)**

Year by PAMR Methodology Changes	Non-Hispanic Black	Non-Hispanic White
2008-2014	29.5	12.1
2015-2016	27.2	10.3
2017-2020 (all deaths)	28.1	27.8
2017-2020 (excluding deaths due to overdose)	28.1	22.3

\*Please note data from 2017-2020 does not include pregnancy-related deaths from 2019. PAMR did not complete committee review for 2019.

**Table 2. Demographic Characteristics of Pregnancy-Related Deaths that Occurred in 2020 in Ohio**

	Total Pregnancy-Related Deaths	2020 Live Births	PRMR per 100,000 Live Births
<b>Age</b>			
<20	0	6,496	-
20-24	6	26,455	-
25-29	13	39,423	33.0**
30-34	7	37,245	-
35-39	7	16,512	-
> = 40	2	3,181	-
	35		



	Total Pregnancy-Related Deaths	2020 Live Births	PRMR per 100,000 Live Births
<b>Education</b>			
12th Grade or Less, No Diploma	12	16,189	74.1**
High School Graduate or GED	10	37,443	26.7**
Some College Credit but No Degree	5	22,839	-
Associate or Bachelor's Degree	5	36,994	-
Advanced Degree (Includes Graduate or Professional Degree)	3	15,447	-
	35		
<b>Race/Ethnicity</b>			
Non-Hispanic White	24	93,259	25.7
Non-Hispanic Black	9	23,360	-
Non-Hispanic, Other Races	1	4,521	-
Hispanic	1	7,672	-
	35		
<b>Insurance</b>			
Uninsured or Self-Pay	1	6,436	-
Insured, Medicaid	14	53,245	26.3**
Insured, Private	10	65,751	15.2**
Insured, Other (Includes CHAMPUS/TRICARE)	0	-	-
Unknown	10	515	1,941.7**
	35		

	Total Pregnancy-Related Deaths	2020 Live Births	PRMR per 100,000 Live Births
<b>Marital Status</b>			
Married	10	72,992	13.7**
Unmarried (Widowed, Divorced, Never Married)	25	56,321	44.4
Unknown	0	7	-
	35		
<b>Pregnancy-Related Mortality Ratio by County Type*** 2017-2018 &amp; 2020*</b>			
ODH County Type***	Pregnancy-Related Deaths	Live Births	PRMR per 100,000 Live Births*
Metropolitan	62	223,534	27.7
Suburban	13	60,982	21.3**
Rural, Non-Appalachian	11	52,069	21.1**
Appalachian	21	64,838	32.4

\* Please note that pregnancy-related deaths by county number have been combined years 2017-2018 and 2020. 2019 is not included as PAMR did not review deaths for 2019.

\*\* Ratios based on fewer than 20 deaths should be interpreted with caution. Ratios based on fewer than ten deaths are not displayed.

\*\*\* ODH and DCY categorize Ohio's 88 counties into four county type designations (suburban, rural non-Appalachian, Appalachian, and metropolitan) based on similarities in terms of population and geography. The current county type designations originated with the Ohio Family Health Survey in 1998, and are based on the U.S. Code and U.S. Census information. Also, Rural, Appalachian counties parallel the Appalachian counties designated by the Appalachian Regional Commission. The Appalachian Region, as defined in ARC's authorizing legislation, is a 205,000-square-mile region that follows the spine of the Appalachian Mountains from southern New York to northern Mississippi. It includes all of West Virginia and parts of 12 other states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia. Forty-two percent of the region's population is rural, compared with 20 percent of the national population.

**Table 3. Underlying Cause of Death of Pregnancy-Related Deaths in 2020 in Ohio**

	<b>Total Pregnancy-Related Deaths</b>	<b>Percent of All Pregnancy-Related Deaths</b>	<b>Pregnancy-Related Mortality Ratio per 100,000 Live Births</b>
Infection	11	31%	8.5**
Mental Health Conditions	7	20%	-
Embolism-Thrombotic (Non-Cerebral)	6	17%	-
Cardiovascular Conditions	4	11%	-
Injury	2	6%	-
Cardiomyopathy	1	3%	-
Collagen Vascular/ Autoimmune Diseases	1	3%	-
Hematologic	1	3%	-
Hemorrhage (Excludes Aneurysms or CVA)	1	3%	-
Hypertensive Disorders of Pregnancy	1	3%	-
	35	100%	27.1

\*\* Ratios based on fewer than 20 deaths should be interpreted with caution. Ratios based on fewer than ten deaths are not displayed.

# APPENDIX C. COMMITTEE DECISION FORM

Review to Action promotes the maternal mortality review process, and houses the Committee Decision Form (CDF) located at the following [link](#).

MIRIA		MATERNAL MORTALITY REVIEW COMMITTEE DECISIONS FORM v22		1																														
REVIEW DATE Month/Day/Year	RECORD ID #	COMMITTEE DETERMINATION OF CAUSE(S) OF DEATH																																
<p><b>IF PREGNANCY-RELATED, COMMITTEE DETERMINATION OF UNDERLYING* CAUSE OF DEATH</b> Refer to page 3 for PMSS-MM cause of death list.</p>																																		
<p><b>PREGNANCY-RELATEDNESS: SELECT ONE</b></p> <p><input type="checkbox"/> <b>PREGNANCY-RELATED</b> A death during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy</p> <p><input type="checkbox"/> <b>PREGNANCY-ASSOCIATED, BUT NOT-RELATED</b> A death during pregnancy or within one year of the end of pregnancy from a cause that is not related to pregnancy</p> <p><input type="checkbox"/> <b>PREGNANCY-ASSOCIATED BUT UNABLE TO DETERMINE PREGNANCY-RELATEDNESS</b></p>		<p><b>TYPE</b></p> <p>UNDERLYING* <input type="checkbox"/></p> <p>CONTRIBUTING <input type="checkbox"/></p> <p>IMMEDIATE <input type="checkbox"/></p> <p>OTHER SIGNIFICANT <input type="checkbox"/></p>																																
<p><b>ESTIMATE THE DEGREE OF RELEVANT INFORMATION (RECORDS) AVAILABLE FOR THIS CASE:</b></p> <p><input type="checkbox"/> <b>COMPLETE</b> All records necessary for adequate review of the case were available</p> <p><input type="checkbox"/> <b>MOSTLY COMPLETE</b> Minor gaps (i.e., information that would have been beneficial but was not essential to the review of the case)</p> <p><input type="checkbox"/> <b>SOMEWHAT COMPLETE</b> Major gaps (i.e., information that would have been crucial to the review of the case)</p> <p><input type="checkbox"/> <b>NOT COMPLETE</b> Minimal records available for review (i.e., death certificate and no additional records)</p>		<p><b>OPTIONAL: CAUSE (DESCRIPTIVE)</b></p>																																
<p><b>DOES THE COMMITTEE AGREE WITH THE UNDERLYING* CAUSE OF DEATH LISTED ON DEATH CERTIFICATE?</b></p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p>		<p><b>COMMITTEE DETERMINATIONS ON CIRCUMSTANCES SURROUNDING DEATH</b></p> <p>DID OBESITY CONTRIBUTE TO THE DEATH? <input type="checkbox"/> YES <input type="checkbox"/> PROBABLY <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN</p> <p>DID DISCRIMINATION** CONTRIBUTE TO THE DEATH? <input type="checkbox"/> YES <input type="checkbox"/> PROBABLY <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN</p> <p>DID MENTAL HEALTH CONDITIONS OTHER THAN SUBSTANCE USE DISORDER CONTRIBUTE TO THE DEATH? <input type="checkbox"/> YES <input type="checkbox"/> PROBABLY <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN</p> <p>DID SUBSTANCE USE DISORDER CONTRIBUTE TO THE DEATH? <input type="checkbox"/> YES <input type="checkbox"/> PROBABLY <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN</p> <p><b>MANNER OF DEATH</b></p> <p>WAS THIS DEATH A SUICIDE? <input type="checkbox"/> YES <input type="checkbox"/> PROBABLY <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN</p> <p>WAS THIS DEATH A HOMICIDE? <input type="checkbox"/> YES <input type="checkbox"/> PROBABLY <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN</p> <p>IF ACCIDENTAL DEATH, HOMICIDE, OR SUICIDE, LIST THE MEANS OF FATAL INJURY</p> <table border="0"> <tr> <td><input type="checkbox"/> FIREARM</td> <td><input type="checkbox"/> FALL</td> <td><input type="checkbox"/> INTENTIONAL</td> </tr> <tr> <td><input type="checkbox"/> SHARP INSTRUMENT</td> <td><input type="checkbox"/> PUNCHING/ KICKING/BEATING</td> <td><input type="checkbox"/> NEGLIGENCE</td> </tr> <tr> <td><input type="checkbox"/> BLUNT INSTRUMENT</td> <td><input type="checkbox"/> EXPLOSIVE</td> <td><input type="checkbox"/> OTHER, SPECIFY:</td> </tr> <tr> <td><input type="checkbox"/> POISONING/ OVERDOSE</td> <td><input type="checkbox"/> DROWNING</td> <td></td> </tr> <tr> <td><input type="checkbox"/> HANGING/ STRANGULATION/ SUFFOCATION</td> <td><input type="checkbox"/> FIRE OR BURNS</td> <td><input type="checkbox"/> UNKNOWN</td> </tr> <tr> <td></td> <td><input type="checkbox"/> MOTOR VEHICLE</td> <td><input type="checkbox"/> NOT APPLICABLE</td> </tr> </table> <p>IF HOMICIDE, WHAT WAS THE RELATIONSHIP OF THE PERPETRATOR TO THE DECEDENT?</p> <table border="0"> <tr> <td><input type="checkbox"/> NO RELATIONSHIP</td> <td><input type="checkbox"/> OTHER</td> <td><input type="checkbox"/> UNKNOWN</td> </tr> <tr> <td><input type="checkbox"/> PARTNER</td> <td><input type="checkbox"/> ACQUAINTANCE</td> <td><input type="checkbox"/> NOT APPLICABLE</td> </tr> <tr> <td><input type="checkbox"/> EX-PARTNER</td> <td><input type="checkbox"/> OTHER, SPECIFY:</td> <td></td> </tr> <tr> <td><input type="checkbox"/> OTHER RELATIVE</td> <td></td> <td></td> </tr> </table>			<input type="checkbox"/> FIREARM	<input type="checkbox"/> FALL	<input type="checkbox"/> INTENTIONAL	<input type="checkbox"/> SHARP INSTRUMENT	<input type="checkbox"/> PUNCHING/ KICKING/BEATING	<input type="checkbox"/> NEGLIGENCE	<input type="checkbox"/> BLUNT INSTRUMENT	<input type="checkbox"/> EXPLOSIVE	<input type="checkbox"/> OTHER, SPECIFY:	<input type="checkbox"/> POISONING/ OVERDOSE	<input type="checkbox"/> DROWNING		<input type="checkbox"/> HANGING/ STRANGULATION/ SUFFOCATION	<input type="checkbox"/> FIRE OR BURNS	<input type="checkbox"/> UNKNOWN		<input type="checkbox"/> MOTOR VEHICLE	<input type="checkbox"/> NOT APPLICABLE	<input type="checkbox"/> NO RELATIONSHIP	<input type="checkbox"/> OTHER	<input type="checkbox"/> UNKNOWN	<input type="checkbox"/> PARTNER	<input type="checkbox"/> ACQUAINTANCE	<input type="checkbox"/> NOT APPLICABLE	<input type="checkbox"/> EX-PARTNER	<input type="checkbox"/> OTHER, SPECIFY:		<input type="checkbox"/> OTHER RELATIVE		
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<p>*Underlying cause refers to the disease or injury that initiated the chain of events leading to death or the circumstances of the accident or violence which produced the fatal injury.</p> <p>**Enccompasses Discrimination, Interpersonal Racism, and Structural Racism as described on page 4.</p>																																		

**COMMITTEE DETERMINATION OF PREVENTABILITY**

A death is considered preventable if the committee determines that there was at least some chance of the death being averted by one or more reasonable changes to patient, family, provider, facility, system and/or community factors.

WAS THIS DEATH PREVENTABLE?  YES  NO

CHANCE TO ALTER OUTCOME  GOOD CHANCE  SOME CHANCE  NO CHANCE  UNABLE TO DETERMINE

**CONTRIBUTING FACTORS AND RECOMMENDATIONS FOR ACTION** (Entries may continue to grid on page 5)

**CONTRIBUTING FACTORS WORKSHEET**

What were the factors that contributed to this death? Multiple contributing factors may be present at each level.

**RECOMMENDATIONS OF THE COMMITTEE**

If there was at least some chance that the death could have been averted, what were the specific and feasible actions that, if implemented or altered, might have changed the course of events?

DESCRIPTION OF ISSUE (enter a description for EACH contributing factor listed)	CONTRIBUTING FACTORS (choose as many as needed below)	LEVEL	COMMITTEE RECOMMENDATIONS [Who?] should [do what?] [when?] Map recommendations to contributing factors.	LEVEL	PREVENTION TYPE (choose below)	EXPECTED IMPACT (choose below)

**CONTRIBUTING FACTOR KEY (DESCRIPTIONS ON PAGE 4)**

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

**DEFINITION OF LEVELS**

- **PATIENT/FAMILY:** An individual before, during or after a pregnancy, and their family, internal or external to the household, with influence on the individual
- **PROVIDER:** An individual with training and expertise who provides care, treatment, and/or advice
- **FACILITY:** A physical location where direct care is provided - ranges from small clinics and urgent care centers to hospitals with trauma centers
- **SYSTEM:** Interacting entities that support services before, during, or after a pregnancy - ranges from healthcare systems and payors to public services and programs
- **COMMUNITY:** A grouping based on a shared sense of place or identity - ranges from physical neighborhoods to a community based on common interests and shared circumstances

**PREVENTION TYPE**

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

**EXPECTED IMPACT**

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

## IF PREGNANCY-RELATED, COMMITTEE DETERMINATION OF UNDERLYING CAUSE OF DEATH\* PMSS-MM

\* PREGNANCY-RELATED DEATH: DEATH DURING PREGNANCY OR WITHIN ONE YEAR OF THE END OF PREGNANCY FROM A PREGNANCY COMPLICATION, A CHAIN OF EVENTS INITIATED BY PREGNANCY, OR THE AGGRAVATION OF AN UNRELATED CONDITION BY THE PHYSIOLOGIC EFFECTS OF PREGNANCY.

<b>Hemorrhage (Excludes Aneurysms or CVA)</b>	<b>Hematologic</b>	<b>Neurologic/Neurovascular Conditions (Excluding CVA)</b>
10.1 - Hemorrhage – Uterine Rupture	82.1 - Sickle Cell Anemia	92.1 - Epilepsy/Seizure Disorder
10.2 - Placental Abruption	82.9 - Other Hematologic Conditions including Thrombophilias/TTP/HUS/NOS	92.9 - Other Neurologic Diseases/NOS
10.3 - Placenta Previa		
10.4 - Ruptured Ectopic Pregnancy	<b>Collagen Vascular/Autoimmune Diseases</b>	<b>Renal Disease</b>
10.5 - Hemorrhage – Uterine Atony/Postpartum Hemorrhage	83.1 - Systemic Lupus Erythematosus (SLE)	93.1 - Chronic Renal Failure/End-Stage Renal Disease (ESRD)
10.6 - Placenta Accreta/Increta/Percreta	83.9 - Other Collagen Vascular Diseases/NOS	93.9 - Other Renal Disease/NOS
10.7 - Hemorrhage due to Retained Placenta		
10.10 - Hemorrhage – Laceration/Intra-Abdominal Bleeding	<b>Conditions Unique to Pregnancy</b>	<b>Cerebrovascular Accident (CVA) not Secondary to HDP</b>
10.9 - Other Hemorrhage/NOS	85.1 - Conditions Unique to Pregnancy (e.g. Gestational Diabetes, Hyperemesis, Liver Disease of Pregnancy)	95.1 - Cerebrovascular Accident (Hemorrhage/Thrombosis/Aneurysm/Malformation) not Secondary to Hypertensive Disorders of Pregnancy
<b>Infection</b>		
20.1 - Postpartum Genital Tract (e.g., of the Uterus/ Pelvis/Perineum/Necrotizing Fasciitis)		
20.2 - Sepsis/Septic Shock	88.1 - Intentional (Homicide)	<b>Metabolic/Endocrine</b>
20.4 - Chorioamnionitis/Antepartum Infection	88.2 - Unintentional	96.2 - Diabetes Mellitus
20.6 - Urinary Tract Infection	88.9 - Unknown Intent/NOS	96.9 - Other Metabolic/Endocrine Disorders/NOS
20.7 - Influenza		
20.8 - COVID-19	<b>Cancer</b>	<b>Gastrointestinal Disorders</b>
20.10 - Pneumonia	89.1 - Gestational Trophoblastic Disease (GTD)	97.1 - Crohn's Disease/Ulcerative Colitis
20.11 - Other Non-Pelvic Infection (e.g. TB, Meningitis, HIV)	89.3 - Malignant Melanoma	97.2 - Liver Disease/Failure/Transplant
20.9 - Other Infection/NOS	89.9 - Other Malignancies/NOS	97.9 - Other Gastrointestinal Diseases/NOS
<b>Embolic - Thrombotic (Non-Cerebral)</b>	<b>Cardiovascular Conditions (excluding cardiomyopathy, HDP, and CVA)</b>	<b>Mental Health Conditions</b>
30.1 - Embolism – Thrombotic (Non-Cerebral)	90.1 - Coronary Artery Disease/Myocardial Infarction (MI)/Atherosclerotic Cardiovascular Disease	100.1 - Depressive Disorder
30.9 - Other Embolism (Excludes Amniotic Fluid Embolism)/NOS	90.2 - Pulmonary Hypertension	100.2 - Anxiety Disorder (including Post-Traumatic Stress Disorder)
	90.3 - Valvular Heart Disease Congenital and Acquired	100.3 - Bipolar Disorder
	90.4 - Vascular Aneurysm/Dissection (Non-Cerebral)	100.4 - Psychotic Disorder
	90.5 - Hypertensive Cardiovascular Disease	100.5 - Substance Use Disorder
	90.6 - Marfan Syndrome	100.9 - Other Psychiatric Conditions/NOS
	90.7 - Conduction Defects/Arrhythmias	
	90.8 - Vascular Malformations Outside Head and Coronary Arteries	<b>Unknown COD</b>
	90.9 - Other Cardiovascular Disease, including CHF, Cardiomegaly, Cardiac Hypertrophy, Cardiac Fibrosis, Non-Acute Myocarditis/NOS	999.1 - Unknown COD
<b>Amniotic Fluid Embolism</b>		
31.1 - Embolism - Amniotic Fluid		
<b>Hypertensive Disorders of Pregnancy (HDP)</b>		
40.1 - Preeclampsia		
50.1 - Eclampsia		
60.1 - Chronic Hypertension with Superimposed Preeclampsia		
<b>Anesthesia Complications</b>	<b>Pulmonary Conditions (Excludes ARDS-Adult Respiratory Distress Syndrome)</b>	
70.1 - Anesthesia Complications	91.1 - Chronic Lung Disease	
	91.2 - Cystic Fibrosis	
<b>Cardiomyopathy</b>	91.3 - Asthma	
80.1 - Postpartum/Peripartum Cardiomyopathy	91.9 - Other Pulmonary Disease/NOS	
80.2 - Hypertrophic Cardiomyopathy		
80.9 - Other Cardiomyopathy/NOS		

**CONTRIBUTING FACTOR DESCRIPTIONS**

**LACK OF ACCESS/FINANCIAL RESOURCES**  
Systemic barriers, eg, lack of health care insurance or other financial dures, as opposed to noncompliance, impacted their ability to care for themselves (eg, did not seek services because unable to miss work or afford postpartum visits after insurance expired). Other barriers to accessing care: insurance non-eligibility, provider shortage in their geographical area, and lack of public transportation.

**ADHERENCE TO MEDICAL RECOMMENDATIONS**  
The provider or patient did not follow protocol or failed to comply with standard procedures (ie, non adherence to prescribed medications).

**FAILURE TO SCREEN/INADEQUATE ASSESSMENT OF RISK**  
Factors placing the individual at risk for a poor clinical outcome recognized, and they were not transferred/transported to a provider able to give a higher level of care.

**CHRONIC DISEASE**  
Occurrence of one or more significant pre-existing medical conditions (eg, obesity, cardiovascular disease, or diabetes).

**CLINICAL SKILL/QUALITY OF CARE (PROVIDER OR FACILITY PERSPECTIVE)**  
Personnel were not appropriately skilled for the situation or did not exercise clinical judgment consistent with standards of care (eg, error in the preparation or administration of medication or unavailability of translation services).

**POOR COMMUNICATION/LACK OF CASE COORDINATION OR MANAGEMENT/ LACK OF CONTINUITY OF CARE (SYSTEM PERSPECTIVE)**  
Care was fragmented (ie, uncoordinated or not comprehensive) among or between healthcare facilities or units, (eg, records not available between inpatient and outpatient or among units within the hospital, such as Emergency Department and Labor and Delivery).

**LACK OF CONTINUITY OF CARE (PROVIDER OR FACILITY PERSPECTIVE)**  
Care providers did not have access to individual's complete records or did not communicate their status sufficiently. Lack of continuity can be between prenatal, labor and delivery, and postpartum providers.

**CULTURAL/RELIGIOUS, OR LANGUAGE FACTORS** The provider or patient demonstrated that any of these factors was either a barrier to care due to lack of understanding or led to refusal of therapy due to beliefs (or belief systems).

**DELAY**  
The provider or patient was delayed in referring or accessing care, treatment, or follow-up care/action.

**DISCRIMINATION**

Treating someone less or more favorably based on the group, class or category they belong to resulting from biases, prejudices, and stereotyping. It can manifest as differences in care, clinical communication and shared decision-making. (Smedley et al, 2003 and Dr. Rachel Hardeman).

**ENVIRONMENTAL FACTORS**

Factors related to weather or social environment.

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

**INTERPERSONAL RACISM**

Discriminatory interactions between individuals based on differential assumptions about the abilities, motives, and intentions of others and resulting in differential actions toward others based on their race. It can be conscious as well as unconscious, and it includes acts of commission and acts of omission. It manifests as lack of respect, suspicion, devaluation, scapegoating, and dehumanization. (Jones, CP, 2000 and Dr. Cornelia Graves).

**KNOWLEDGE - LACK OF KNOWLEDGE REGARDING IMPORTANCE OF EVENT OR OF TREATMENT OR FOLLOW-UP**  
The provider or patient did not receive adequate education or lacked knowledge or understanding regarding the significance of a health event (eg, shortness of breath as a trigger to seek immediate care) or lacked understanding about the need for treatment/follow-up after evaluation for a health event (eg, needed to keep appointment for psychiatric referral after an ED visit for exacerbation of depression).

**INADEQUATE LAW ENFORCEMENT RESPONSE**

Law enforcement response was not in a timely manner or was not appropriate or thorough in scope.

**LEGAL**

Legal considerations that impacted outcome.

**MENTAL HEALTH CONDITIONS**

The patient had a documented diagnosis of a psychiatric disorder. This includes postpartum depression. If a formal diagnosis is not available, refer to your review committee subject matter experts (eg, psychiatrist, psychologist, licensed counselor) to determine whether the criteria for a diagnosis of substance use disorder or another mental health condition are met based on the available information.

**INADEQUATE COMMUNITY OUTREACH/RESOURCES**

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

**LACK OF STANDARDIZED POLICIES/PROCEDURES**

The facility lacked basic policies or infrastructure germane to the individual's needs (eg, response to high blood pressure, or a lack of or outdated policy or protocol).

**LACK OF REFERRAL OR CONSULTATION**

Specialists were not consulted or did not provide care; referrals to specialists were not made.

**SOCIAL SUPPORT/ISOLATION - LACK OF FAMILY/ FRIEND OR SUPPORT SYSTEM**

Social support from family, partner, or friends was lacking, inadequate, and/or dysfunctional.

**STRUCTURAL RACISM**

The systems of power based on historical injustices and contemporary social factors that systematically disadvantage people of color and advantage white people through inequities in housing, education, employment, earnings, benefits, credit, media, health care, criminal justice, etc. - (Adapted from Bailey ZD. Lancet. 2017 and Dr. Carla Ortigue)

**SUBSTANCE USE DISORDER - ALCOHOL, ILLICIT/ PRESCRIPTION DRUGS**

Substance use disorder is characterized by recurrent use of alcohol and/or drugs causing clinically and functionally significant impairment, such as health problems or disability. The committee may determine that substance use disorder contributed to the death when the disorder directly compromised their health status (eg, acute methamphetamine intoxication exacerbated pregnancy- induced hypertension, or they were more vulnerable to infections or medical conditions).

**TOBACCO USE**

The patient's use of tobacco directly compromised the patient's health status (eg, long-term smoking led to underlying chronic lung disease).

**TRAUMA**

The individual experienced trauma: ie, loss of child (death or loss of custody), rape, molestation, or one or more of the following: sexual exploitation during childhood plus persuasion, inducement, or coercion of a child to engage in sexually explicit conduct or other physical or emotional abuse other than that related to sexual abuse during childhood.

**UNSTABLE HOUSING**

Individual lived "on the street," in a homeless shelter, or in transitional or temporary circumstances with family or friends.

**VIOLENCE AND INTIMATE PARTNER VIOLENCE (IPV)**

Physical or emotional abuse perpetrated by current or former intimate partner, family member, friend, acquaintance, or stranger.

**OTHER**

Contributing factor not otherwise mentioned. Please provide description.





## **APPENDIX D. CONTRIBUTORS & ACKNOWLEDGEMENTS**

### ***Contributors***

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Bureau of Vital Statistics staff were responsible for the collection of the birth and death certificate data on which this report is partially based. We thank PAMR Review Committee members past and present for their time, expertise, and dedication. We thank the PAMR nurse abstractors for their amazing work. We thank staff past and present who have supported PAMR. We acknowledge technical assistance and review provided by the CDC.

### ***Suggested Citation***

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## APPENDIX E. REFERENCES

- AJMC Staff. (2021, January 1). A timeline of COVID-19 developments in 2020. American Journal of Managed Care. Retrieved January 29, 2024, from <https://www.ajmc.com/view/a-timeline-of-covid19-developments-in-2020>
- Atrash, Hani K. et al. (2001). Strategies to reduce pregnancy-related deaths; from identification and review to action.
- Centers for Disease Control and Prevention. (2023a). Working Together to Reduce Black Maternal Mortality. Retrieved January 12, 2024, from <https://www.cdc.gov/healthequity/features/maternal-mortality/index.html>
- Centers for Disease Control and Prevention. (2023b). CDC Museum COVID-19 timeline. Retrieved January 29, 2024, from <https://www.cdc.gov/museum/timeline/covid19.html>
- Ideastream Public Media. (n.d.). Ohio's Coronavirus Pandemic: A Timeline. Ideastream Public Media. Retrieved January 29, 2024, from <https://www.ideastream.org/ohios-coronavirus-pandemic-a-timeline>
- Ohio Department of Health. (2019). A Report on Pregnancy-Associated Deaths in Ohio 2008- 2016. Columbus, OH: Ohio Department of Health.
- Ohio Department of Health. (2023). A Report on Pregnancy-Related Deaths in Ohio 2017-2018. Columbus, OH: Ohio Department of Health.
- Shellhaas, C., & Conrey, E. (2018). State-based Review of Maternal Deaths: The Ohio Experience. *Clinical obstetrics and gynecology*, 61(2), 332–339. <https://doi.org/10.1097/GRF.0000000000000348>
- Smid, M. C., Maeda, J., Stone, N. M., Sylvester, H., Baksh, L., Debbink, M. P., Varner, M. W., & Metz, T. D. (2020). Standardized Criteria for Review of Perinatal Suicides and Accidental Drug-Related Deaths. *Obstetrics and gynecology*, 136(4), 645–653. <https://doi.org/10.1097/AOG.0000000000003988>
- Smid, M.C., Vaughn, P., Nowicki, C.C., Goodman, D.A., Zaharatos, J., Campbell, K.A. (2024). Consensus pregnancy-related criteria for suicide and unintentional overdoses using a Delphi process. *Archives of Women's Mental Health* (27), 109–125. <https://doi.org/10.1007/s00737-023-01375-4>
- United States Government Accountability Office. (2022, October 19). Maternal health outcomes worsened and disparities persisted during the pandemic (Report to Congressional Addressees). <https://www.gao.gov/products/gao-23-105871>
- Zambrano, L. D., Ellington, S., Strid, P., Galang, R. R., Oduyebo, T., Tong, V. T., Woodworth, K. R., Nahabedian, J. F., Azziz-Baumgartner, E., Gilboa, S. M., Meaney-Delman, D., Akosa, A., Bennett, C., Burkel, V., Chang, D., Delaney, A., Fox, C., Griffin, I., Hsia, J., ... Zapata, L. (2020). Update: Characteristics of symptomatic women of reproductive age with laboratory-confirmed SARS-COV-2 infection by pregnancy status — United States, January 22–October 3, 2020. *MMWR. Morbidity and Mortality Weekly Report*, 69(44), 1641–1647. <https://doi.org/10.15585/mmwr.mm6944e3>