

Pennsylvania Maternal Mortality Review: 2021 Report

**Bureau of Family
Health**

January 2022



pennsylvania
DEPARTMENT OF HEALTH

Contents

Dedication	3
Acknowledgments	4
Mission and Vision	5
Executive Summary	6
Definitions	7
Maternal Mortality in Pennsylvania	9
Program Overview	10
Methods	12
Findings	15
Recommendations	21
Limitations	24
Future Planning for PA MMRC	25
Closing Statement	26

Dedication

The Department of Health expresses its gratitude to the members of the Pennsylvania Maternal Mortality Review Committee for their expertise, time and flexibility. This multidisciplinary team reviewed cases of maternal deaths and created recommendations intended to prevent future maternal deaths.

It is with deepest sympathy and respect that we dedicate this report to the memory of all individuals who died while pregnant or within one year of pregnancy. We hope that our efforts to understand the causes and contributing factors of these deaths will prevent future deaths from occurring in Pennsylvania.

Acknowledgments

Maternal Mortality Review Committee Co-Chairs

Stacy Beck, MD and Amanda Flicker, MD, FACOG

Maternal Mortality Review Committee Members

Valerie Arkoosh, MD, MPH	Karen Pollack, MSW
Jason Baxter, MD, MSCP, FACOG	Stefanie Porges, MD
Kay-Ella Bleecher, RN, MSN, CRNP, CEN	Jessica Riley, MD
Sonya Borrero, MD, MS	Patricia Ross, D-ABMDI
Betty Braxter, PhD, CNM, RN	David Silver, MD, MBA, FACOG
Carolyn Byrnes, MPH, CPH	Nazanin Silver, MD, MPH, FACOG
Joanne Craig, MS	Stephen Smith, MD, MBA
Antoine Douaihy, MD	Sindhu Srinivas, MD, MSCE
Julia Greenawalt, PhD, RNC-OB, CHSE	Tara Trego, M.Ed
Roy Hoffman, MD, MPH	Christina VandePol, MD
Denise Johnson, MD, FACOG, FACHE	Margery Wasko, MD
Sarah Kawasaki, MD	Amy Whitsel, MD
Dara Mendez, PhD, MPH	Dannai Wilson, MA
Nancy Niemczyk, CNM, PhD	

Maternal Mortality Review Committee Program Staff

Elizabeth Filipovich, MPH	Tahesia Thomas, MPA, MHA
Giselle Hallden	Gina Wiser, MPH

The Centers for Disease Control and Prevention (CDC) provides funding and assistance to the Department of Health to support the activities related to the Maternal Mortality Review Committee. This work is also supported with funding from the Title V Maternal and Child Health Services Block Grant.

Mission

The Pennsylvania Maternal Mortality Review Committee's mission is to systematically review all maternal deaths, identify root causes of these deaths, and develop strategies to reduce preventable morbidity, mortality and racial disparities related to pregnancy in Pennsylvania.

Vision

The Pennsylvania Maternal Mortality Review Committee's vision is to eliminate preventable maternal deaths and racial disparities and reduce maternal morbidities in Pennsylvania.

Executive Summary

Prior to the creation of the Pennsylvania Maternal Mortality Review Committee (PA MMRC), there was no statewide effort in Pennsylvania to review maternal deaths. In 2018, PA MMRC was established by the Maternal Mortality Review Act, or Act 24 of 2018, to confidentially review all pregnancy-associated deaths and provide recommendations to reduce preventable pregnancy-related deaths in Pennsylvania. Data and recommendations found in this report exclude Philadelphia County residents. Philadelphia has independently reviewed maternal deaths of its residents since 2010. Philadelphia's most recent maternal mortality report is available [here](#).

PA MMRC program staff used a variety of data sources to identify all 2018 deaths of Pennsylvania residents (excluding Philadelphia county residents) who were pregnant or had been pregnant in the year prior to their death. There were 85 pregnancy-associated deaths identified in 2018. PA MMRC held eight review meetings between its establishment in 2018 and June of 2021. In these meetings, the multidisciplinary committee of clinical and non-clinical professionals, who serve pregnant and postpartum individuals, reviewed 44 of the 85 maternal deaths that occurred in 2018. From the 44 deaths reviewed, 135 recommendations to prevent future maternal deaths in Pennsylvania were developed. The recommendations were reviewed and categorized into broad themes that highlight the recurring factors contributing to maternal deaths in Pennsylvania. The themes and supporting recommendations were used in the creation of this report.

The recommendations presented in this report identify opportunities for the prevention of future pregnancy-related deaths. Local, state and federal agencies, as well as health care providers and other organizations and individuals involved in improving maternal health in Pennsylvania can use this report and the recommendations presented to advocate for necessary improvements to the care of pregnant and postpartum individuals.

Key Recommendation Themes

- Build infrastructure to identify and support pregnant and postpartum individuals with mental health concerns.
- Build infrastructure to identify and support pregnant and postpartum individuals who use substances.
- Build infrastructure to provide more comprehensive medical care for all pregnant and postpartum individuals.
- Build infrastructure to identify and support pregnant and postpartum individuals with a history of intimate partner violence.

Definitions

- **Maternal death** (also known as **maternal mortality**) is often defined as a death from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy or within 42 days of the end of pregnancy, irrespective of the duration and site of the pregnancy.¹ This definition is often used in reports of maternal deaths based on vital statistics data. However, the term is sometimes used to describe deaths within one year of pregnancy, regardless of cause. In this report, maternal death includes deaths within one year of pregnancy, regardless of the cause of death.
- **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, including all accidental or incidental causes of maternal death.² Pregnancy-associated deaths are reviewed by Maternal Mortality Review Committees (MMRCs) and then subcategorized as either 1) pregnancy-related or 2) pregnancy-associated but not related. All deaths during pregnancy and up to one year postpartum are considered pregnancy-associated. In this report, the term maternal death is used to refer to all pregnancy associated deaths.
- **Pregnancy-related death** is the death of an individual while pregnant or within one year of the end of a pregnancy – regardless of the outcome, duration, or site of the pregnancy – from any cause related to or aggravated by the pregnancy or its management.² An example of pregnancy-related death would be maternal death from a complication of eclampsia.
- **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.² An example of a pregnancy-associated – but not related death would be a maternal death from an accidental house fire.
- **Pregnancy-associated – but unable to determine relatedness** 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 case to determine if the death was pregnancy-related or pregnancy-associated – but not related to death. An example of a pregnancy-associated – but unable to determine relatedness death would be a maternal death from suicide where there were no records available to see if the death was related to or aggravated by pregnancy or its management.
- **Pregnancy-associated mortality ratio (PAMR)** is the number of pregnancy-associated 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.

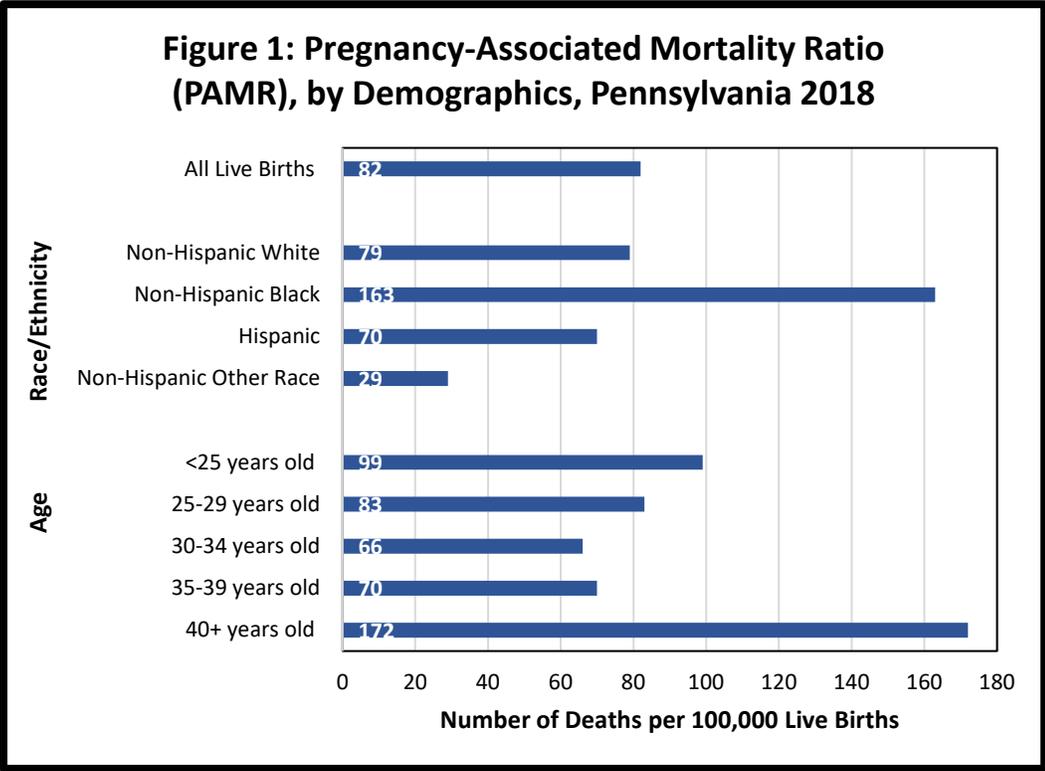
Maternal Mortality in Pennsylvania (including Philadelphia County)

According to the 2020 Census population estimates, Pennsylvania is currently the fifth most populous state in the country.³ In 2018, Pennsylvania's population was approximately 12.8 million people.⁴ Individuals who were assigned female at birth and are of reproductive age (10-60), as defined by the CDC guidance on identifying cases of maternal deaths, made up more than 32% of the state's population.⁴ In 2018, there were 135,677 reported live births, 28,240 reported abortions, and 1,165 reported fetal deaths in Pennsylvania.⁵ Of these pregnancies, 111 resulted in a maternal death.

Pennsylvania is racially and ethnically diverse, with non-Hispanic white individuals accounting for approximately 64% of live births, non-Hispanic Black individuals accounting for 13% of live births, Hispanic individuals accounting for 12% of live births, and non-Hispanic individuals of other races accounting for 8% of live births.⁶ The remaining 3% of live births identified race but did not specify an ethnicity.⁶

Pregnancy-Associated Mortality Ratio

Pregnancy-associated mortality ratios (PAMR) estimate the number of pregnancy-associated deaths for every 100,000 live births. This ratio is often used as an indicator to measure the health of the population at large since factors that affect the health of the entire population can also affect mortality among pregnant and postpartum individuals. Additionally, PAMRs depict how maternal mortality affects different populations of individuals in Pennsylvania. The overall PAMR for Pennsylvania was 82 deaths per 100,000 live births. Non-Hispanic Blacks had the highest PAMR (163 per 100,000 live births), which is two times higher than the PAMR for non-Hispanic whites. Individuals giving birth in the 40+ age category had a PAMR more than two times higher than individuals giving birth in the 25-29, 30-34 and 35-39 age categories (**Figure 1: Pregnancy-Associated Mortality Ratio (PAMR), by Demographics, Pennsylvania 2018**).



Program Overview

Maternal Mortality Review Committee

Maternal Mortality Review Committees (MMRCs) are multidisciplinary committees that convene at the state or local level to comprehensively review deaths of individuals during or within a year of pregnancy.⁷ MMRCs have access to clinical and non-clinical information (e.g., vital records, medical records, social service records) to better understand the circumstances surrounding each death and to develop recommendations for action to prevent similar deaths.⁷

Establishment of PA MMRC

To examine maternal mortality and make recommendations to prevent future maternal deaths, PA MMRC was established by the Maternal Mortality Review Act, or Act 24 of 2018. Prior to the establishment of the committee, the commonwealth did not have a formal process for investigation of maternal deaths and the dissemination of findings. The Philadelphia MMRC, which was established in 2010, operates independently from the statewide PA MMRC in collaboration with Department of Health (department) program staff. Philadelphia county, whose residents account for roughly 20% of Pennsylvania’s maternal deaths, averages approximately 18 deaths per year.

Under Act 24, the department has authority to appoint members to participate in a multidisciplinary team of experts responsible for reviewing cases of maternal deaths and developing recommendations to prevent future deaths. In 2018, the department established

the committee by recruiting individuals through an application process. Interested professionals submitted applications to the department, which were reviewed internally and approved by the Secretary of Health.

Per Act 24, in appointing members to the committee, the Secretary of Health shall:

- (1) Include members from various geographic regions in this commonwealth, including both rural and urban areas, and from both academic and community-based hospitals and health networks that are of varying size.
- (2) Endeavor to include members who are working in and representing communities that are most affected by maternal deaths and by a lack of access to relevant perinatal and intrapartum care services.
- (3) Include members who represent several academic disciplines and professional specializations essential to reviewing cases of maternal deaths.

History of PA MMRC

PA MMRC includes both clinical and non-clinical individuals, who represent diverse interests that pertain to prevention of maternal deaths, including maternal-fetal medicine, obstetrics and gynecology, midwifery, addiction medicine, emergency medicine, community health, psychiatry, social work and violence prevention.

The department applied and received grant funding from the CDC through Preventing Maternal Deaths: Supporting Maternal Mortality Review Committees. The initial award, granted on July 30, 2019, spans from September 30, 2019 to September 29, 2024. The department receives \$449,998 annually from the CDC to support PA MMRC's work. Funding is primarily used for staffing (75% of award). Additional funding is used to support the Philadelphia MMRC (20% of award) and program essentials such as software, supplies and travel (5% of award).

Program-specific staffing for PA MMRC began in February 2019, under the direction of the Office of the Secretary of Health, by hiring a full-time medical records abstractor. An epidemiology research associate and public health program administrator were hired in the spring and summer of 2020. Administration of the program shifted from the Office of the Secretary of Health to the Bureau of Family Health (BFH) in the spring of 2021.

PA MMRC members and program staff had several planning meetings to determine policies and articulate the mission and vision for PA MMRC. During these initial meetings, it was decided that PA MMRC would review all maternal deaths from 2018 onward. Two in-person case review meetings were held in 2019, in which de-identified summaries of the maternal deaths and related events, including medical and psychosocial history, were presented to the committee. Due to the COVID-19 pandemic, PA MMRC meetings were held virtually starting in July 2020 and in subsequent months throughout 2021. Throughout this time period, 44 cases of maternal death were reviewed by PA MMRC. Case review meetings were paused in June 2021 and monthly MMRC business meetings were held to improve internal processes, including committee workflow, receiving records and updating membership. During these business meetings, committee input was solicited for how best to proceed with case review to improve timely review of pregnancy associated deaths.

Methods

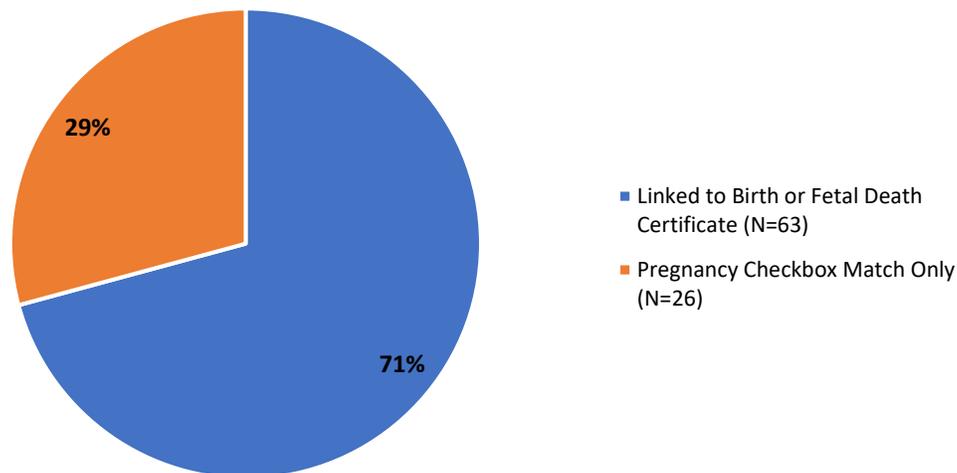
Identification of Maternal Deaths

In order to review maternal deaths, PA MMRC program staff first had to identify maternal deaths within the commonwealth.¹ These deaths, or cases, were identified through vital records data from the Pennsylvania Department of Health, Bureau of Health Statistics and Registries (BHSR). Cases were identified using logic provided by the CDC: first, deaths of Pennsylvania residents (excluding Philadelphia county residents) assigned female at birth, of reproductive age (10-60 years) were identified using death certificate data; next, identified deaths were verified as true cases by examining any linkage to fetal deaths and/or births in the 365 days preceding the death; then, the death certificate's pregnancy checkbox was examined for any individuals of reproductive age that were not linked to a birth or fetal death certificate. The deaths identified through matching to fetal deaths and/or births and pregnancy checkbox were combined, analysis was performed and duplicates were eliminated. Further analyses were completed for cases where the checkbox was marked "Unknown if pregnant within the past year."

There were originally 89 cases identified (excluding Philadelphia county) for the 2018 review year using this method for identifying maternal deaths. Sixty-three of the cases were identified by a matching birth or fetal death certificate and twenty-six were identified only by the pregnancy-checkbox indicating pregnancy within the last year (**Figure 2: Maternal Deaths by Identification Method, Pennsylvania 2018 (N=89)**). Over 40% of these deaths would not have been identified as maternal deaths if the previous identification method of only reviewing the pregnancy checkbox on death certificates was used.

¹ Under Act 24 of 2018, PA MMRC is authorized to review various records related to the deceased for purpose of the committee's review.

Figure 2: Maternal Deaths by Identification Method, Pennsylvania 2018 (N=89)



Record Request Process

It is important for the committee to have a thorough summary about each individual's life and death when reviewing cases, so that appropriate recommendations can be made. The completeness of these summaries depends on the availability of records for each case. Initial record requests were sent to providers and facilities listed within the vital records files.

All cases reviewed by PA MMRC had a death certificate available. The death certificate included a variable on the county of death which was used to identify from which coroner/medical examiner to request a report and autopsy. Records were requested from coroner/medical examiners for all cases; however, autopsies and reports were not always completed. The death certificate also contained a variable listing the facility of death from which records could be requested; however, not all individuals in a facility at the time of their death. In 2018, only 40 (45%) of the 89 cases identified had a death facility listed on the death certificate. If a case was identified via checkbox only, meaning there were no matching fetal death certificates or birth certificates, the only initial requestable records were coroner/medical examiner reports and medical records from the facility of death.

Some of the cases the committee reviewed had a birth certificate or fetal death certificate in the vital records file. Of the 89 cases identified, 57 (64%) were linked to a birth certificate and six (7%) were linked to a fetal death certificate. The vital records file for these cases had a variable that indicated the facility where the birth or fetal death occurred, if applicable. Any additional facilities or providers discovered while reviewing the initial records were also sent a request for records. It was crucial to gather as much information as possible from any providers, facilities or organizations that interacted with the patient prior to their death, in order to better understand the circumstances surrounding each death. Additional records were requested from the Pennsylvania Health Care Cost Containment Council (PHC4) for individuals that were

identified from vital records data. Through a matching process with PHC4, it was determined if any of those individuals had hospitalizations in the year prior to their death, and where that hospitalization occurred, if applicable.

Although records were requested, it is important to note that record requests were not always fulfilled or received in a timely manner. Lack of receipt of requested records was a consistent challenge in completing comprehensive and timely case reviews.

Additional Sources of Information

In addition to medical records, several other data sources were searched to develop a more comprehensive understanding of each individual's life. Pennsylvania's Prescription Drug Monitoring Program (PDMP) system was searched to identify any Schedule II through Schedule V controlled substances that were prescribed to an individual. Records were requested from providers if the prescription was within one year of the death.

The Unified Judicial System of Pennsylvania Web Portal was used to search for court cases, court summaries and docket sheets. Records were requested from law enforcement, if interactions with law enforcement were found within one year of a death. This included arrest records, court proceedings or incarceration records.

Finally, general internet searches were utilized to identify obituaries and media reports. Findings from internet searches provided information not otherwise found in medical records or other official reporting systems.

Creating Summaries

Findings from the records received were used by the medical records abstractors to create de-identified summaries of pertinent medical history and events surrounding each death. These summaries were then presented to the committee for review. Cases regularly took between 10-20 hours to fully abstract and involved reviewing hundreds to thousands of pages of records. Case abstraction varied depending on the number and completeness of records received, complexity of the case and experience of the abstractor. This estimate does not include the time required to identify cases, identify records to be requested, requesting or preparing records for abstraction.

Cases Reviewed

The committee selected 2018 maternal deaths as the first data year to review. There were originally 89 cases identified (excluding Philadelphia county). However, after case identification and review of records, four cases were determined to be falsely identified as a maternal death. False identification occurred when the pregnancy checkbox on a death certificate was erroneously checked. After review of additional records, a final determination was made about

the pregnancy status for each specific case. Ultimately, the 2018 data year included a total of 85 confirmed maternal deaths that were eligible for review by PA MMRC.

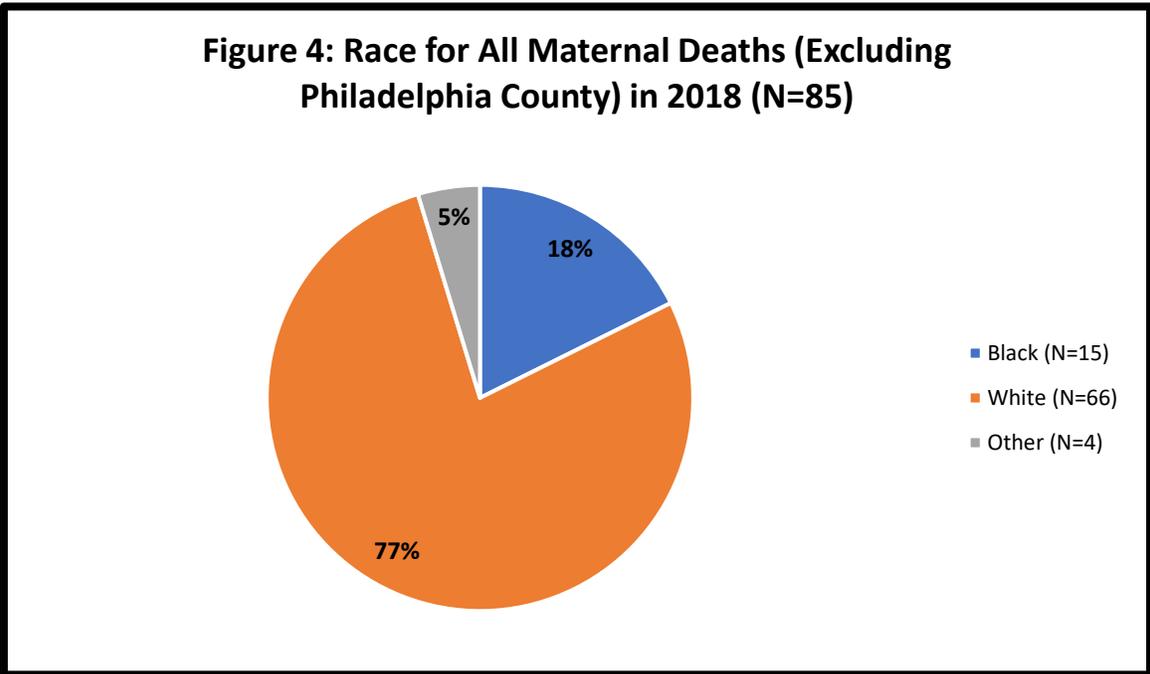
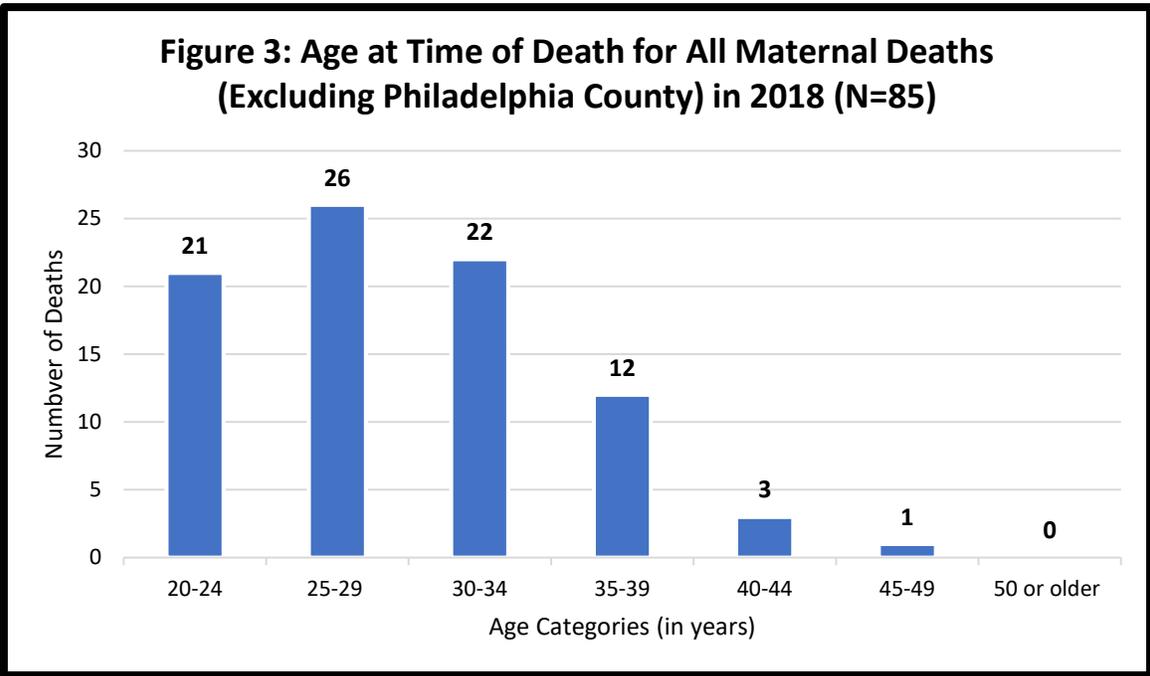
Findings

Although PA MMRC was only able to review a portion of these records, a brief overview of all 85 maternal deaths is provided below. Key trends are as follows:

- Accidental poisonings were the leading cause of maternal deaths in 2018 and accounted for over 50% of all maternal deaths (**Table 1: Top Causes of Death for All Maternal Deaths (Excluding Philadelphia County) in 2018 (N=85)**). This category includes drug-related overdose deaths. In 2013, only 19% of pregnancy-associated deaths were due to accidental poisonings. That over half of all deaths in 2018 fell into this category reflects, in part, the continuing devastating impact of Pennsylvania’s opioid epidemic on both individuals and families.
- Individuals aged 25-29 had the most maternal deaths, with slightly fewer deaths in the 20-24 and 30–34-year-old categories (**Figure 3: Age at Time of Death for All Maternal Deaths (Excluding Philadelphia County) in 2018 (N=85)**).
- Seventy-seven percent of maternal deaths were of individuals listed as white on their death certificate (**Figure 4: Race for All Maternal Deaths (Excluding Philadelphia County) in 2018 (N=85)**). While it is not identified in the individual 2018 data year, racial disparities in adverse maternal health outcomes persist in Pennsylvania as evidenced by the fact that non-Hispanic Blacks had a PAMR two times greater than the PAMR for non-Hispanic whites. Racial disparities in maternal mortality stem from the detrimental effects of institutional and interpersonal racism, implicit bias among providers and social determinants of health^{8,9}.

Table 1: Top Causes of Death for All Maternal Deaths (Excluding Philadelphia County) in 2018 (N=85)

Cause of Death	Number of Deaths	Overall Percentage
Accidental Poisoning	43	51%
Other Direct Obstetric Deaths	9	11%
Transportation Accidents	8	9%
Assault	7	8%
Other Pregnancy Related	4	5%
Intentional Self-Harm	4	5%



As outlined previously, the committee conducted a full review of 44 cases (52% of the overall true cases) between July 2019 and May 2021. Cases were reviewed over the course of eight meetings, based upon availability of relevant records. These cases were not randomly selected and do not serve as a representative sample of all 2018 deaths.

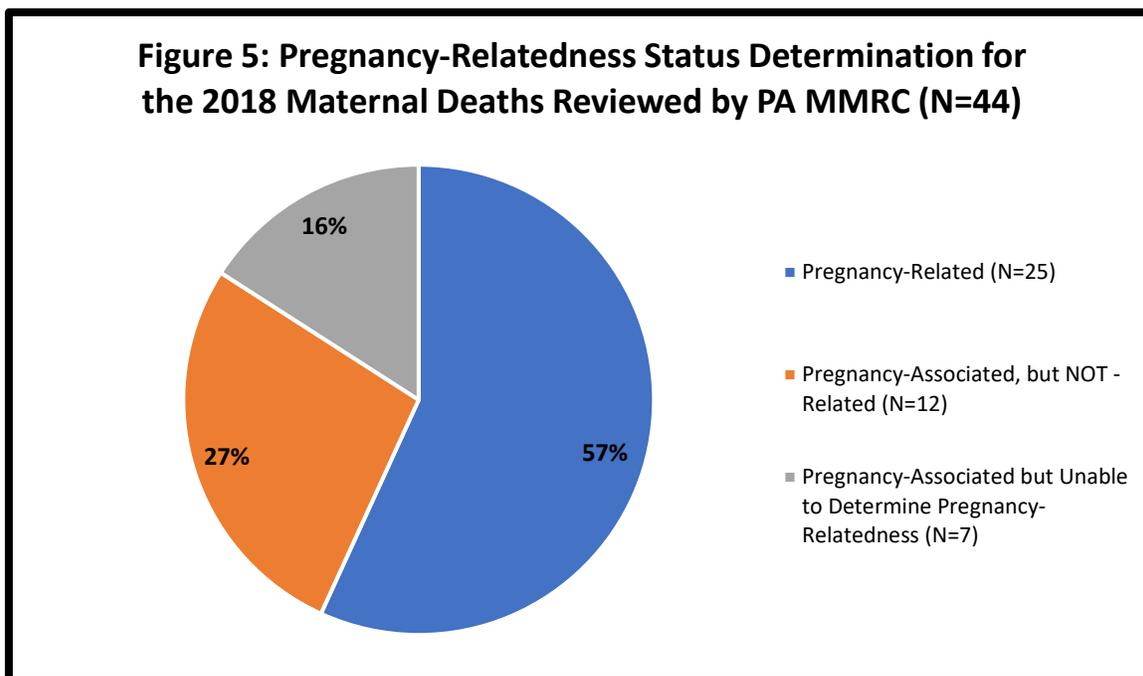
CDC’s Maternal Mortality Review Information Application (MMRIA) is nationally used by MMRCs to enter case information and recommendations as well as to track national trends. All cases were reviewed using the CDC’s MMRIA Committee decision form to record key

information on pregnancy-relatedness, completeness of records, circumstances surrounding death and manner of death. However, preventability and recommendations were only discussed for cases that were deemed by PA MMRC to be pregnancy-related. The committee made 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?

Pregnancy-Relatedness

Of the 44 cases reviewed, 57% of them (N=25) were classified as pregnancy-related and 27% (N=12) were classified as pregnancy-associated, but not related. The committee was unable to determine pregnancy-relatedness in 16% (N=7) of the cases reviewed, in some instances, due to lack of records or information needed to make the determination (**Figure 5: Pregnancy-Relatedness Status Determination for the 2018 Maternal Deaths Reviewed by PA MMRC (N=44)**).



Completeness of Records

Of the 44 cases reviewed, the committee classified 39% (N=17) as having complete records, 23% (N=10) as having mostly complete records, and 39% (N=17) as having somewhat complete records. Of the cases where the committee was unable to determine pregnancy-relatedness (N=7), 86% (N=6) had records that were only deemed somewhat complete (**Table 2: Completeness of Records by Pregnancy-Relatedness Determination for the 2018 Maternal Deaths Reviewed by PA MMRC (N=44)**).

	Complete	Mostly Complete	Somewhat Complete
Pregnancy-Related (N=25)	11 (44%)	7 (28%)	7 (28%)
Pregnancy-Associated, but Not Related (N=12)	5 (42%)	3 (25%)	4 (33%)
Pregnancy-Associated, but Unable to Determine Pregnancy-Relatedness (N=7)	1 (14%)	0 (0%)	6 (86%)
Overall (N=44)	17 (39%)	10 (23%)	17 (39%)

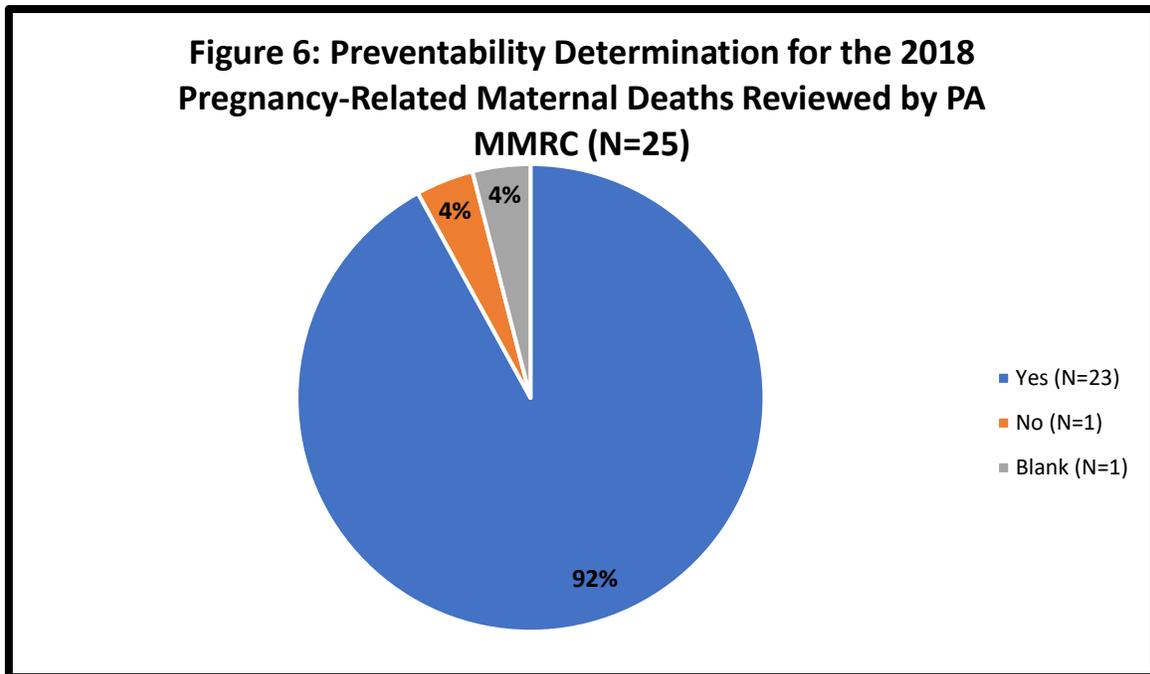
Contributing Factors

Of the 44 cases reviewed, the committee classified 7% (N=3) as having obesity as a contributing factor, 2% (N=1) as having discrimination as a contributing factor, 39% (N=17) as having mental health conditions other than substance use disorder as a contributing factor, and 34% (N=15) as having substance use disorder as a contributing factor (**Table 3: Committee Determinations on Contributing Factors for the 2018 Maternal Deaths Reviewed by PA MMRC (N=44)**).

	Yes	Probably	No	Unknown	Blank
Did obesity contribute to the death?	3 (7%)	2 (5%)	34 (77%)	5 (11%)	0 (0%)
Did discrimination contribute to the death?	1 (2%)	8 (18%)	18 (41%)	11 (25%)	6 (14%)
Did mental health conditions other than substance use disorder contribute to the death?	17 (39%)	4 (9%)	17 (39%)	6 (14%)	0 (0%)
Did substance use disorder contribute to the death?	15 (34%)	3 (7%)	22 (50%)	4 (9%)	0 (0%)

Preventability

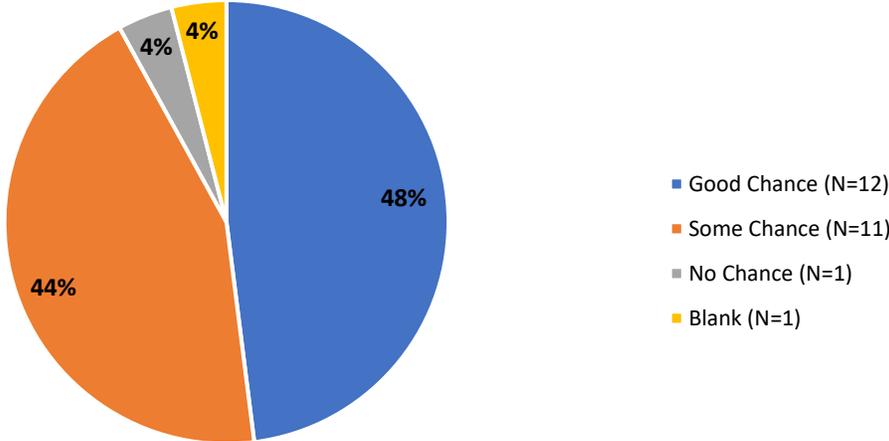
If a case was classified by the committee as pregnancy-related, the committee also made a determination on the preventability of the death. Deaths were considered preventable if there was at least some chance of the death being averted by one or more reasonable changes to patient, family, provider, facility, system and/or community factors. Of the 25 pregnancy-related deaths, the committee classified 92% (N=23) as preventable, 4% (N=1) as not preventable, and 4% (N=1) were left blank by the committee (**Figure 6: Preventability Determination for the 2018 Pregnancy-Related Maternal Deaths Reviewed by PA MMRC (N=25)**).



Chance to Alter Outcome

The committee determined, utilizing their experience, expertise and observations about each specific case, what chance there was that the outcome could have been altered. The committee chose between good chance, some chance and no chance. Of the 25 pregnancy-related deaths, the committee classified 48% (N=12) as having a good chance, 44% (N=11) as having some chance, 4% (N=1) no chance of being altered, and 4% (N=1) were left blank (**Figure 7: Chance to Alter Outcome Determination for the 2018 Pregnancy-Related Maternal Deaths Reviewed by PA MMRC (N=25)**).

Figure 7: Chance to Alter Outcome Determination for the 2018 Pregnancy-Related Maternal Deaths Reviewed by PA MMRC (N=25)



Recommendations

Recommendations were created for all cases determined to be pregnancy-related by the committee (N=25). In total, there were 135 recommendations created for these cases. All of these recommendations were presented to the committee and the committee categorized the recommendations into the following themes.

1. Build infrastructure to identify and support pregnant and postpartum individuals with mental health concerns.

- a. Recommendations for Policymakers, inclusive of the General Assembly and State Agencies, include the following:
 1. Safeguard continuous Medicaid eligibility for individuals during pregnancy and up to one year postpartum.
 2. Address the privacy laws around mental health and psychiatry to improve care coordination and communication by allowing providers to share relevant information with each other for pregnant and postpartum patients. Considerations should be made to require transparency to facilitate patient autonomy.
 3. Increase public education on mental health during pregnancy and the postpartum period to decrease stigma.
- b. Recommendations for Health Care Providers and Hospital Systems include the following:
 1. Refer pregnant and postpartum patients with mental health concerns for psychiatric and/or psychological care.
 2. Promote standards of care and guidelines for treatment of mental health by:
 - i. Providing ongoing training/education for providers on mental health.
 - ii. Implementing universal screening for mental health conditions in pregnant and postpartum individuals using a validated screening tool.
 - iii. Developing guidelines around frequency and timing of mental health screening for pregnant and postpartum patients.
 - iv. Developing plans for care coordination and communication for all pregnant and postpartum patients.
 - v. Increasing work force capacity of mental health providers to support a potential increase in pregnant and postpartum patient referrals due to universal screening for mental health conditions.

2. Build infrastructure to identify and support pregnant and postpartum individuals who use substances.

- a. Recommendations for Policymakers, inclusive of the General Assembly and State Agencies, include the following:

1. Safeguard continuous Medicaid eligibility for individuals during pregnancy and up to one year postpartum.
 2. Address the privacy laws around substance use disorder (SUD) treatment to improve care coordination and communication by allowing providers to share relevant information with each other for pregnant and postpartum patients. Considerations should be made to require transparency to facilitate patient autonomy.
 3. Decriminalize all substance use for pregnant people and promote mental health and substance use treatment.
 4. Increase public education on SUD to decrease stigmatization of pregnant and postpartum individuals.
- b. Recommendations for Health Care Providers and Hospital Systems include the following:
1. Refer pregnant and postpartum patients with substance use concerns for behavioral health and substance use treatment.
 2. Promote standards of care and guidelines for treatment of substance use disorder (SUD) by:
 - i. Providing ongoing training/education for providers on substance use among pregnant and postpartum individuals.
 - ii. Implementing universal screening in pregnant and postpartum individuals for substance use using a validated screening tool.
 - iii. Developing guidelines around frequency and timing of substance use screening for pregnant and postpartum patients.
 - iv. Developing plans for care coordination and communication for all pregnant and postpartum patients.
 - v. Increasing work force capacity of substance use treatment providers to support a potential increase in pregnant and postpartum patient referrals due to universal screening for SUD.
 3. Standardize discharge plans for all hospital stays for pregnant and postpartum patients with OUD, or a prescription for an opioid, to include distribution or prescription for naloxone, instructions on how to use and where to get naloxone when needed.
- c. Recommendations for Community-Based Organizations include:
Increase community knowledge of naloxone, including information on procurement and instructions for use.

3. Build infrastructure to provide more comprehensive medical care for all pregnant and postpartum individuals.

- a. Recommendation for Policymakers, inclusive of the General Assembly and State Agencies, include the following:
Safeguard continuous Medicaid eligibility for individuals during pregnancy and up to one year postpartum.

- b. Recommendations for Health Care Providers and Hospital Systems include the following:
 - 1. Establish and implement protocols using national guidelines for pregnant/postpartum hemorrhage and massive transfusion, with particular consideration for small hospitals that may not be equipped to treat high risk patients.
 - 2. Host drills for pregnant and postpartum hemorrhage response, massive transfusion, and estimating/quantifying blood loss to practice facilities' protocols at least annually.
 - 3. Have emergency carts and cards in obstetric units and emergency departments for blood loss and cardiac/uncommon emergencies.
 - 4. Review and update existing emergency medical services (EMS) protocols as appropriate for pregnancy and postpartum hemorrhage, and continue educational efforts directed towards EMS providers on the recognition and treatment of emergency conditions related to pregnancy.

- c. Recommendations for Community-Based Organizations include the following:
 - 1. Increase community knowledge of social supports available within the community to improve health outcomes (e.g., doulas, home visiting services, community health workers).
 - 2. Connect pregnant and postpartum clients with the resources needed to be able to attend medical appointments (e.g., transportation, information on getting medical coverage, childcare assistance).

4. Build infrastructure to identify and support pregnant and postpartum individuals with history of intimate partner violence.

- a. Recommendations for Policymakers, inclusive of the General Assembly and State Agencies, include the following:
 - 1. Safeguard continuous Medicaid eligibility for individuals during pregnancy and up to one year postpartum.
 - 2. Increase available funding for evidence-based intimate partner violence (IPV)/domestic violence (DV) prevention programs and training, including training for first responders and law enforcement.

- b. Recommendations for Health Care Providers and Hospital Systems include the following:
 - 1. Refer pregnant and postpartum patients with IPV to supportive services.
 - 2. Promote standards of care and guidelines for addressing IPV/DV by:
 - i. Providing ongoing training/education to all patient facing staff on trauma-informed, patient-centered care for IPV/DV.
 - ii. Implementing universal education and assessment for pregnant and postpartum individuals for IPV/DV using a validated tool.
 - iii. Developing guidelines around frequency and timing of IPV/DV education and assessment for pregnant and postpartum patients.
 - iv. Developing plans for care coordination and communication for all pregnant and postpartum patients.

- c. Recommendations for Community-Based Organizations include the following:
 1. Improve the connection between community-based organizations and law enforcement offices to provide referrals and linkage to services for individuals experiencing IPV/DV.
 2. Engage community partners to provide public education to community members on identifying, preventing and responding to IPV/DV.

Limitations

Staffing

Program staff play a vital role in the success of PA MMRC and staffing was a consistent challenge for the duration of the program. Throughout 2018 and 2019, the program was not adequately staffed and without adequate staffing, the program could not operate efficiently. In particular, hiring and maintaining medical records abstractors was a persistent challenge since the committee was established. Turnover in the medical records abstractor role, along with challenges in receiving records contributed to delays in case abstraction and review. With over 80 cases to review per year, it is vital to have adequate staffing so record requests, record abstractions and case reviews can be completed in a timely manner.

Receiving Records

Per Act 24, PA MMRC has authority to review several sources of information related to maternal death, including but not limited to: death certificates, birth certificates, coroner/Medical Examiner reports, adult protective services records, law enforcement records and medical records. This information is critical to understanding the circumstances surrounding a death and allows PA MMRC to develop appropriate recommendations and prevention activities to reduce maternal mortality in the commonwealth. Though Act 24 gave PA MMRC the authority to view records, there is no provision within the act that mandates a timeframe for entities to provide records or any recourse for noncompliance. Other states with a similar number of annual maternal deaths have more success in receiving records because their statutes mandates a definitive time period for providers to comply with sending records. Program staff have experienced continuous challenges receiving records from providers in a timely manner, if at all. Thus, missing or incomplete records add to the challenge of creating a detailed case file to present to committee members during review meetings. This also affects the quality of the data being reviewed and hinders the committee from making informed recommendations.

In addition to requesting records form external sources, the department collaborates with other state agencies and offices to receive records relevant to the case review. Many state agencies and offices, including the Office of Children, Youth, and Families (OCYF), Department of Drug and Alcohol Programs (DDAP) and Office of Mental Health and Substance Abuse Services (OMHSAS), have statutory requirements that limit the data and information that can be shared across agencies. For PA MMRC to obtain data from these offices, statutory changes would be required that allow for sharing of information across agencies for the purpose of case review.

Program staff had limited relationships with providers due to the newness of the program and, as a result, receiving accurate and complete records from providers was a consistent challenge. Without access to records, case abstraction is limited to vital records information and internet searches. Further complicating the process, program staff have no uniform way of receiving records. Records are mailed in or received electronically, via fax or email.

COVID-19 Pandemic

In March 2020, the commonwealth took extraordinary measures to mitigate the spread of COVID-19, including office closures and transitioning to telework for all PA MMRC staff. This shift to telework meant that management had to create new procedures and protocols to hire and train new staff, to receive and scan in medical records and hold virtual MMRC review meetings. These new processes caused delays in abstracting and reviewing cases at the beginning of the pandemic.

The pandemic further compounded existing challenges due to health care providers and coroner/medical examiners being inundated with COVID-19 cases. This meant that record requests from PA MMRC were further delayed or were unable to be fulfilled.

Future Planning for PA MMRC

Sustained future planning is required to address many challenges PA MMRC currently faces, including staffing, receiving records and adapting to the changes to business practices due to the COVID-19 pandemic. Program staff continue to work towards solutions for each of the documented limitations.

Increased staffing is a primary focus to expedite the record abstraction process for case review. Abstracting a single case is a large task, which requires a dedicated medical records abstractor to spend several hours reviewing records, requesting records from providers, compiling data, creating case narratives and entering information into the MMRIA system. The program manager is working through the commonwealth process to hire a part-time medical records abstractor.

Program staff are working to combat limitations in receiving records by strengthening partnerships with record providers. By building internal and external relationships, program staff aim to connect with more providers and partners and alleviate delays in receiving records. Program staff have enhanced existing partnerships with the Pennsylvania Violent Death Reporting System and the Vital Records Office. Program staff have also started to receive access to health system's electronic medical records systems.

Finally, program staff are continually working to improve the processes needed to make PA MMRC more successful. In addition to developing new forms, program staff are focused on creating a more collaborative relationship with MMRC members and establishing a more clear and concise case review process. Program staff are also training MMRC members on the

MMRIA Committee Decision Form to increase efficiency in case review and completeness of recommendations.

Closing Statement

PA MMRC and program staff have worked diligently to identify necessary changes to support ongoing efforts to prevent deaths of pregnant and postpartum individuals within the commonwealth. The work of PA MMRC, the recommendations brought forth, and the analysis of the deaths from 2018 can be used to inform efforts from partners at the federal, state, and local levels. It is the department's goal to ensure that the work of PA MMRC will be impactful in reducing maternal death and improving the health of pregnant and postpartum individuals.

Citations

1. World Health Organization. International statistical classification of diseases and related health problems, 10th revision. 2008 ed. Geneva, Switzerland. 2009
2. *Maternal Mortality Review Committee Facilitation Guide*. (2019). Centers for Disease Control and Prevention.
3. *Quick Facts Pennsylvania*: April 1, 2020. United States Census Bureau American. Retrieved August 13, 2021 from <https://www.census.gov/quickfacts/PA>
4. *Population*. Pennsylvania Department of Health – Pennsylvania Vital Statistics 2018. Retrieved September 23, 2021 from https://www.health.pa.gov/topics/HealthStatistics/VitalStatistics/PAVitalStatistics/Documents/PA_Vital_Statistics_Population_2018.pdf
5. *Reported Pregnancies*. Pennsylvania Department of Health – Pennsylvania Vital Statistics 2018. Retrieved August 13, 2021 from https://www.health.pa.gov/topics/HealthStatistics/VitalStatistics/PAVitalStatistics/Documents/PA_Vital_Statistics_Pregnancy_2018.pdf
6. Data Requested from Pennsylvania Department of Health, Bureau of Health Statistics and Registries
7. Pregnancy-Related Deaths: Data from 14 U.S. Maternal Mortality Review Committees, 2008-2017. Centers for Disease Control and Prevention. Retrieved August 17, 2021 from <https://www.cdc.gov/reproductivehealth/maternal-mortality/erase-mm/mmr-data-brief.html>
8. *Journal of Women's Health*. February 2021. How Implicit Bias Contributes to Racial Inequities in Maternal Morbidity and Mortality in the United States. Bani Saluja and Zenobia Bryant. Retrieved August 13, 2021 from <http://doi.org/10.1089/jwh.2020.8874>.
9. *Journal of Women's Health*. February 2021. Social and Structural Determinants of Inequities in Maternal Health. Joia Crear-Perry et al. Retrieved August 13, 2021 from <http://doi.org/10.1089/jwh.2020.8882>.