Louisiana Pregnancy-Associated Mortality Review

Maternal Mortality in Louisiana

2020 REPORT

April 2024

LOUISIANA DEPARTMENT OF HEALTH

AUTHORS:

Anjell DeGruy, BSN, RN, Pregnancy-Associated Mortality Review (PAMR) Coordinator, Louisiana Department of Health (LDH), Office of Public Health (OPH), Bureau of Family Health (BFH)

Camille Teixeira, MSW, MPH, Health Communications Specialist, LDH-OPH-BFH

Imani Evans, MPH, Maternal Morbidity and Mortality Epidemiologist, LDH-OPH-BFH

Veronica Gillispie-Bell, MD, MAS, FACOG, Medical Director, Louisiana Perinatal Quality Collaborative LaPQC and PAMR

CONTRIBUTORS:

Andrea Outhuse, MPH, Health Communications Project Manager, LDH-OPH-BFH

Amy Zapata, MPH, Director, LDH-OPH-BFH

Carli Harvey, MPH, Maternal Morbidity and Mortality Epidemiologist, LDH-OPH-BFH

Dionka Pierce, MPH, Program Manager, Interim Data to Action Team Lead, LDH-OPH-BFH

Lyn Kieltyka, PhD, MPH, State MCH Epidemiologist LDH-OPH-BFH

Finally, we honor the women whose experiences we have attempted to understand and learn from here, as well as their partners, children, families and communities. We hope that the lessons learned from their deaths will help to create new pathways to prevention, health and equity.

Gender Referencing

The Louisiana PAMR Committee strives to be inclusive of all birthing people and acknowledges that not all individuals who get pregnant or give birth identify as women. The use of terminology and language is reflective of current research and advocacy work to reduce overall maternal mortality and morbidity, as well as racial and ethnic health disparities in pregnancy and birth outcomes. There is a need for increased awareness, medical assistance, and inclusion for individuals who do not identify as women in pregnancy and birth-related services.

Table of Contents

Introduction to Pregnancy-Associated Mortality Review in Louisiana

MATERNAL MORTALITY

Maternal mortality is an indicator of healthcare quality and gender equity, nationally and internationally.[1,2] Studying maternal deaths can help illuminate health and social challenges that people of reproductive age experience, and systemic responsiveness to these challenges.[1,2] In the United States, maternal mortality is higher than any other developed country and significant racial disparities exist.[3]

Surveillance using vital statistics can capture general trends and disparities, but it is widely recognized that state and local maternal mortality review committees are best positioned to perform comprehensive assessments of and identify opportunities for prevention of [4] pregnancy-associated deaths.

LOUISIANA PREGNANCY-ASSOCIATED MORTALITY REVIEW (PAMR)

In 2010, LDH-OPH-BFH established the Louisiana PAMR to understand and address maternal mortality in our state.

In 2018, Louisiana PAMR launched an enhanced multidisciplinary review process to be in full alignment with national best practices promoted by the CDC. The case review process was enhanced by expanding the PAMR committee to ensure representation from a variety of geographic regions and fields of expertise, including substance use and mental health. Today, the committee consists of both clinical and non-clinical experts. The Louisiana PAMR committee prides itself in its diversity of disciplines as well as gender, race, and ethnicity. To ensure that the committee's work is informed by individuals who know and understand the context of Louisiana, the BFH team continues recruitment efforts in disproportionately impacted communities statewide.

Louisiana PAMR's mission is to protect and promote the health of women and families in Louisiana through surveillance, multidisciplinary case review, timely reports, and provision of actionable recommendations. This helps to understand and prevent pregnancy-associated deaths and support prevention, transformation, and innovation in individuals, families, providers, birthing facilities, health systems, and communities. PAMR works to quantify and understand pregnancy-associated deaths in order to create actionable, comprehensive recommendations to prevent future deaths through epidemiological surveillance and multidisciplinary case review (see Appendix A for full list of PAMR Committee members).

Louisiana's PAMR committee (hereafter referred to as "the committee") reviews all pregnancy-associated deaths of Louisiana residents, regardless of the cause of death. Case reviews occur two years after the death occurred. From January 2022 to December 2022, committee members volunteered their time to complete reviews of pregnancy-associated deaths that occurred in 2020. All committee members were required to sign a confidentiality form prior to receiving de-identified case summaries.

Note on Data Comparisons
This is a single-year report that summarizes the committee's review of pregnancy-associated deaths that occurred in 2020 and the resulting recommendations for prevention. This report should be considered a stand-alone report, and data in this report should not be compared to the multi-year 2017-2019 PAMR Report. Comparisons can be made to the 2017 PAMR Report and the 2018 PAMR Report, which were also single-year reports.

Key Definitions

The following terms will be used throughout the report. All definitions come from the CDC in collaboration with key partners in maternal mortality prevention.

Pregnancy-Associated Deaths[5]		
A death that occurs during or within one year of pregnancy, regardless of the cause. This is an umbrella term that includes pregnancy-related deaths; pregnancy-associated, but not related deaths; and pregnancy-associated, but unable to determine relatedness deaths, as defined below. *This report focuses on all deaths that meet the criteria for this definition*.		
Pregnancy-Related[5]	**Pregnancy-Associated, but Not Related[5]**	**Pregnancy-Associated, but Unable to Determine Relatedness[5]**
A death during or within one year of pregnancy, from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.	A death during or within one year of pregnancy, from a cause that is **not** related to pregnancy.	A pregnancy-associated death where the cause of death is unable to be determined as "pregnancy-related" or "pregnancy-associated, but not related."
Example Cause of Death^	**Example Cause of Death^**	**Example Cause of Death^**
Hypertensive disorders of pregnancy (uncontrolled and extreme high blood pressure during pregnancy leading to serious health complications, including possible organ damage)	Motor vehicle crash (unintentional)	Suicide

Preventability[5] — A death is considered preventable if there was at least some chance of the death being prevented by one or more reasonable changes to patient, family, provider, facility, system, and/or community factors. (See Appendix C for additional information on chance to alter outcome.)

^ – Additional case-specific details beyond cause of death are required to determine which of the three subcategories a pregnancy-associated death falls into. The example causes presented here are not mutually exclusive to the categories they are paired with above.

VITAL RECORDS DATA AND LINKAGE METHODOLOGY

Deaths were identified through a combination of linkages, the pregnancy checkbox on death certificates and obstetric code (O-code) causes of death. Deaths were identified in four steps:

1. **Data linkages:** Death certificates of women between the ages of 10-55 were linked to infant birth and fetal death certificates that occurred within one year. SAS version 8.3 was used in conjunction with the LinkPro macro and Link King to complete all linkages.
2. **Pregnancy checkbox:** Death certificates with the pregnancy checkbox filled in, indicating the decedent was pregnant at the time of death or within one year of pregnancy, were identified as potential pregnancy-associated deaths.
3. **O-codes:** Deaths of women where the ICD-10 code for underlying cause of death was in chapter O (causes related to pregnancy, childbirth or complications during the postpartum period) were identified as potential pregnancy-associated deaths.
4. **LaHIDD linkages:** Linkages between death records and hospital discharge records were conducted to identify additional cases. All women between the ages of 10 and 55 who had any pregnancy-related ICD-10CM codes were included. Women who were found to have a delivery, positive pregnancy test or an ectopic pregnancy were added to the list of potential pregnancy-associated deaths. LaHIDD linkages were conducted using Link Plus and Link King software.

CASE VALIDATION

Use of vital records death data alone is not enough to identify true pregnancy-associated deaths. Potential pregnancy-associated deaths identified using the above mentioned methods require validation by the BFH's MCH Coordinators using medical records and/or coroner reports. This validation process ensures that "false positive" identifications of pregnancy-associated deaths that result from the pregnancy box being checked in error are significantly reduced or eliminated. A death is considered "confirmed", and therefore eligible for review, if the MCH Coordinator confirms a pregnancy within one year of death based on the available records.

DATA LIMITATIONS

Classification based on ICD-10 O-codes or the pregnancy checkbox alone are more likely to result in misclassification. The ability to classify these deaths relies heavily on the availability of medical and coroner records. Potential reasons for missed cases include, but are not limited to:

- Early pregnancies that were not known or detected at the time of death.
- Recent miscarriages, other pregnancy terminations or fetal deaths that were not known or detected at the time of death.
- Failing to identify a live birth or fetal death record associated with a woman who was pregnant or had recently delivered at the time of death.
- Missing or delayed data between pregnancy-associated deaths and live births.

Rates, ratios and percentages based on counts fewer than 20 are considered unstable and should be interpreted with caution, as these numbers, percentages or ratios may change in the future with the addition or loss of a small number of cases. Unstable ratios are noted with an asterisk (*). Due to small numbers, trends may be unable to be identified.

Louisiana's Pregnancy-Associated Mortality Review Process

Committee Review Process

MMRC EXAMINATION PROCESS

Case Selection → Abstraction → Case Narrative Development → Case Review Presentation → Findings Entered into Database → Data Analysis → Implement and Evaluate → Case Identification
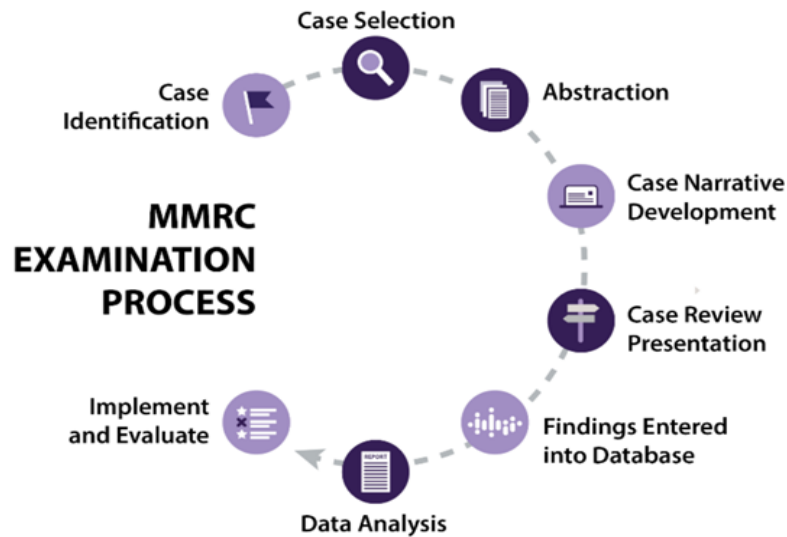
110 Identified Deaths

Identified deaths met the following criteria:
- Louisiana resident at the time of death, even if death occurred out of state
- Between the ages of 10 and 55 years at the time of death
- Identified as having been pregnant at the time of death or within one year of death by linkage of the death certificate to a corresponding live birth or fetal death certificate or inpatient hospital discharge record, indication of pregnancy status on the death certificate through the pregnancy checkbox, or cause of death had an ICD-10 code of A34, O00-O99 (causes related to pregnancy, childbirth or complications during the postpartum period).

CASES REVIEWED BY REGIONAL MCH COORDINATORS

28 False Cases	82 Confirmed Pregnancy-Associated Deaths
MCH Coordinators found evidence that the decedent was not pregnant at the time of death or within the year prior to death, through medical records, coroner reports, obituaries and/or media.	MCH Coordinators found documentation of a pregnancy at the time of death or within one year of death in medical records, coroner reports, obituaries and/or media.

CASES DID NOT MOVE FORWARD TO ABSTRACTION AND REVIEW

CASES MOVED FORWARD TO ABSTRACTION AND REVIEW

Committee Review Process

CASE ABSTRACTION AND CASE NARRATIVE DEVELOPMENT

Once a case is confirmed as a pregnancy-associated death, the regional MCH Coordinators abstract data from various sources including, but not limited to, prenatal/postpartum care, hospital, coroner, EMS, and law enforcement records. Using information obtained during the abstraction process, the MCH Coordinators develop a de-identified case narrative that details the decedent's life from pre-conception through death, including both medical and social information.

CASE REVIEWS AND DISCUSSION OF PREGNANCY-ASSOCIATED DEATHS

During meetings, the committee conducts an in-depth review of each case. Throughout case discussions, respect and justice for the decedent are maintained. Anyone with personal knowledge of a particular case is asked to recuse themselves from the review process so to not share details or anecdotal information beyond the information presented in the case narrative.

Questions used during each individual case review that allow the committee to make several key decisions include:
1. Was the death pregnancy-related? "If this person was not pregnant, would they have died?"
2. What was the underlying cause of death?
3. Was the death preventable? Was there a chance to alter the outcome?
4. What were the factors that contributed to the death?
5. If there was at least some chance that the death could have been prevented, what were the specific and feasible actions that, if implemented or changed, might have altered the course of events?

After each case discussion, the committee makes decisions about each case and completes the MMRIA Committee Decisions form (Appendix C) as a group, including recommendations for prevention.

Maternal Mortality Review Committee Representation†

22   23
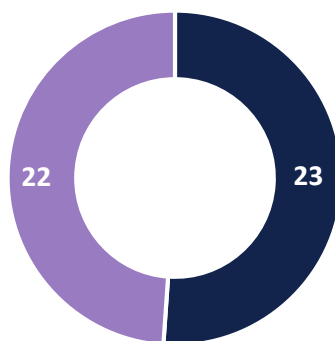
†The MMRC representation is reflected by the calendar year of case review.

■ Clinical   ■ Non-Clinical

DATA ANALYSIS

Following each case review meeting, all data and committee decisions are entered into the MMRIA database. Data is used to establish trends over time and to inform recommendations for healthcare professionals, healthcare systems, government and public health agencies, policy makers, insurance payors, and social and local community organizations.

Identifying Pregnancy Relatedness for Overdoses and Suicide
Implementing the Utah Tool

In 2020 and 2021, drug overdose deaths, particularly deaths involving synthetic opioids like fentanyl, reached record highs in the United States.[6] Among pregnant and postpartum women, drug overdose mortality increased approximately 81% from 2017 to 2020, and increases in drug overdose mortality were most pronounced in 2020, coinciding with the onset of the COVID-19 pandemic.[6] From 2017-2019, accidental drug overdoses were the leading cause of pregnancy-associated deaths in Louisiana, and this continues to be the trend across the state.

Across the country, maternal mortality review committees (MMRCs) have found it difficult to categorize accidental overdoses and suicides as pregnancy-related or pregnancy-associated, but not related when posed with the questions "Was the death pregnancy-related? If this person was not pregnant, would they have died?" To address this question, in 2021, Louisiana PAMR began using "The Utah Tool".

THE UTAH TOOL

The Utah MMRC created a standardized tool to help other MMRCs determine pregnancy-relatedness for deaths due to accidental drug overdoses and suicides (See Appendix E for the Utah Tool) Utilizing the Utah Tool has allowed for better identification of pregnancy-relatedness in the cases of accidental drug overdoses and suicides. Because of this, there has been a decrease in the number of cases that were classified as pregnancy-associated, but unable to determine relatedness.
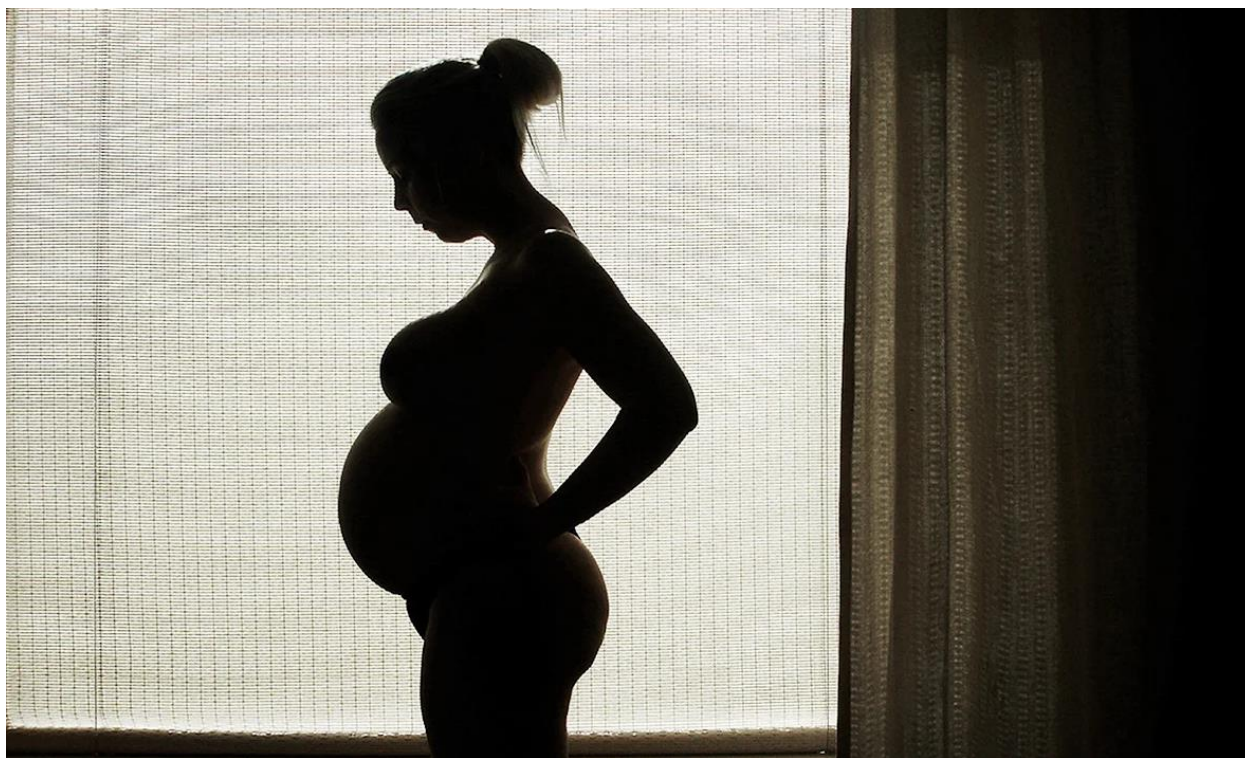
Evaluating the Impact of Bias and/or Discrimination in Review of Pregnancy-Associated Mortality in Louisiana

Data from the CDC's 2019 Pregnancy Mortality Surveillance System (PMSS) noted significant racial and ethnic disparities across the United States. According to the CDC's Division of Reproductive Health, from 2017-2019, the pregnancy-related mortality ratio for non-Hispanic Black persons was 39.9 deaths per 100,000 live births, compared to a rate of 14.1 deaths per 100,000 live births for non-Hispanic White persons.[7] The trends in disparities continue to be seen over time. According to the National Center for Health Statistics, "In 2020, the maternal mortality rate for non-Hispanic Black women was 55.3 deaths per 100,000 live births, 2.9 times the rate for non-Hispanic White women. Rates for non-Hispanic Black women were significantly higher than rates for non-Hispanic White and Hispanic women."[8]

In acknowledgement of these disparities and the importance of this issue, in 2020, the CDC added a discrimination checkbox, which encompasses discrimination and interpersonal and structural racism, to the MMRIA Committee Decisions Form (Appendix C).

THE LOUISIANA BIAS OR RACISM AND SOCIAL DETERMINANTS OF HEALTH (LABoRS TOOL)

The disparity in maternal mortality is a complex issue that is due to many factors, including, but not limited to, implicit bias and structural racism impacting social determinants of health. With the data the committee has access to, determining racism, bias or discrimination as a contributing factor in a pregnancy-associated death can be difficult, but the Louisiana PAMR team is committed to reviewing each death through a lens of equity.

To help the committee better answer the question "Did discrimination contribute to the death?" our team developed and began using the LABoRS Tool in 2020 with the review of 2018 cases.

The LABoRS Tool provides a standardized process to evaluate each case for the presence of bias, discrimination, and/or racism, as well as the impacts of social determinants of health as contributors to the death. The goal of the LABoRS Tool is not to prove bias and/or racism, but to assist abstractors as well as committee members in identifying evidence of potential discrimination and inequity to support the committee in making informed recommendations that address these contributing factors if they are present. (See Appendix D for the LABoRS Tool)

Results of the Review

Summary of Key Findings

1. The committee reviewed 82 confirmed pregnancy-associated deaths of Louisiana residents that occurred in 2020.
   - **15 deaths were *pregnancy-related*.** The top causes of death in this category were **cardiomyopathy, cardiovascular conditions, infection, and accidental overdose.**
   - **64 deaths were *pregnancy-associated, but not related*.** The top causes of death in this category were **accidental overdose, homicide and motor vehicle collision.**
   - **3 deaths were *pregnancy-associated, but unable to determine relatedness*.** The top cause of death in this category was **accidental overdose**.
     - *Note: Because of the low number of pregnancy-associated, but unable to determine relatedness deaths, rates, ratios and percentages for additional data points were not calculated.*

2. The overall ratio of all ***pregnancy-associated* deaths in Louisiana was 143.3 per 100,000 births**. The ratio of ***pregnancy-related* deaths in Louisiana was 26.2 per 100,000 births***. The ratio of ***pregnancy-associated but not related* deaths in Louisiana was 111.8 per 100,000 births**.

3. For **all *pregnancy-associated* deaths, Black women were two and a half times more likely to die as White women in Louisiana**. This disparity is more prominent in pregnancy-related deaths.
   - **13 out of 15 *pregnancy-related* deaths occurred among Black women.**
   - Among ***pregnancy-associated, but not related* deaths, almost 2 Black women (1.8) in Louisiana died for every 1 White woman.**

4. **60%** of women who experienced a pregnancy-associated death **had health insurance through Medicaid.** Women **ages 30 years and older** had the highest ratio of pregnancy-associated death. Women with a **high school diploma or less** accounted for **72%** of all pregnancy-associated deaths.

5. The majority of all deaths, **93% of *pregnancy-related*** and **71% of *pregnancy-associated but not related***, occurred after delivery up to 1 year after pregnancy.

6. The committee determined that **93% of *pregnancy-related* deaths*** and **81% of *pregnancy-associated, but not related* deaths** were potentially preventable.

7. The committee identifies contributing factors to deaths across the following levels: patient/family, provider, facility, systems and community. Contributing factors are not mutually exclusive and a death may have more than one contributing factor identified. Please refer to Appendix C for complete definitions of each level.
   - **Provider and facility level factors were the most commonly-identified contributing factors to *pregnancy-related* deaths**, including issues related to policies and procedures.
   - **System and patient/family level factors were the most commonly-identified contributing factors to *pregnancy-associated, but not related deaths*.** Systems level issues were most frequently related to policies and procedures, while patient/family level issues were most frequently related to Substance Use Disorder (SUD) and lack of adherence to motor vehicle safety recommendations.
   - **System level factors related to policies and procedures were the most commonly-identified contributing factors to *pregnancy-associated, but unable to determine relatedness deaths*.** These included violence, access/financial factors, communication, continuity of care/care coordination, lack of referrals and inadequate assessment.

Snapshot of Pregnancy-Associated Deaths

In 2020, Louisiana had 82 confirmed pregnancy-associated deaths. This represents a pregnancy-associated mortality ratio of 143.3 deaths per 100,000 births.

BREAKDOWN OF PREGNANCY-RELATEDNESS

Of the **82** deaths reviewed, the committee determined:

- **15** deaths (18%*) were classified as **pregnancy-related**.

- **64** deaths (78%) were classified as **pregnancy-associated, but not related**.

- **3** deaths (4%*) were classified as **pregnancy-associated, but the committee was unable to determine relatedness**.

Percentages based on counts fewer than 20 are considered unstable and should be interpreted with caution.

78%

18%

4%
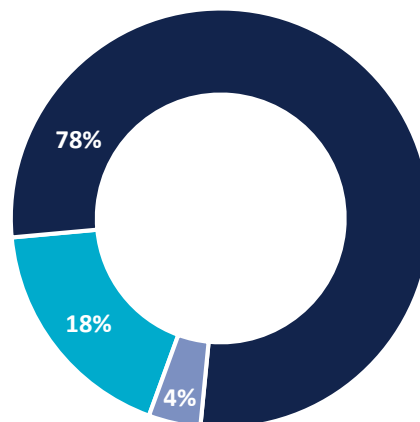
CAUSES OF DEATH

Pregnancy-Associated Deaths by Relatedness and Cause of Death as Determined by the Committee:

Cause	Pregnancy-Related	Pregnancy-Associated, but Not Related	Pregnancy-Associated, but Unable to Determine Relatedness
Accidental Overdose	3	23	2
Homicide		10	
Infection	3	5	
Motor Vehicle Crash		8	
Cancer		6	
Cardiomyopathy	4	1	
Cardiovascular Conditions	3		
Metabolic/Endocrine		2	
Suicide		2	
Thrombotic Embolism	1	1	
Cerebrovascular Accident		1	
Collagen Vascular/Autoimmune Diseases		1	
Drowning		1	
Gastrointestinal Conditions		1	
Hemorrhage	1		
Neurologic/Neurovascular Conditions		1	
Pulmonary Conditions		1	
Unknown			1

■ Pregnancy-Related

■ Pregnancy-Associated, but Not Related

■ Pregnancy-Associated, but Unable to Determine Relatedness

Key Points

- The leading causes of pregnancy-associated deaths were accidental overdose (34%) and homicide (12%).
- *Pregnancy-associated, but not related* deaths accounted for the majority of deaths (78%).
- Nearly 1 in 5 (18%*) deaths were determined to be *pregnancy-related*, with cardiomyopathy being the leading cause.

Availability of Records

About 1 in 3 cases were missing **at least some records** crucial to case review.

COMPLETENESS OF RECORDS FOR REVIEW

Access to complete records is critical to determine factors that contributed to pregnancy-associated deaths, and to determine their preventability. **56 out of 82 cases (68%)** were determined by the committee to have **complete records available** for review.

31% (25 cases) were identified as having either **"mostly complete"** or **"somewhat complete"** records, meaning that **information crucial to the review of the case was not available** to the review committee (see Appendix C for full definitions of complete, mostly complete, somewhat complete and not complete). Performing an adequate review of pregnancy-associated deaths requires information from multiple types of records such as those provided by:

- Medical/health systems
- Law enforcement
- Mental/behavioral health providers and systems
- Government or social service agencies

Records can be difficult to obtain due to:

- Lack of information or data sharing agreements and processes in place across and among multiple systems that provide case to individuals.
  - *Example: Medical record sharing across health networks can be limited.*
- Legal restrictions and policies that regulate what information agencies can share.
  - *Example: It is difficult to obtain records related to a death that is part of an ongoing criminal investigation.*
- Reluctance or hesitation to share copies of records obtained from external agencies.
- Staff turnover which hinders collaboration and information sharing between and across agencies or systems.

AUTOPSIES

Autopsies reveal information that helps establish cause of death. Without an autopsy, it is challenging to determine the immediate and underlying cause of death in certain scenarios.

Autopsies were performed in almost two-thirds (57%) of cases.

Autopsy 57%

No Autopsy 43%

Key Points

- Access to full records would allow for a more complete understanding of pregnancy-associated deaths. Data sharing agreements across and within systems and agencies for the purpose of maternal mortality review would improve the review committee's access to needed records (e.g. records related to or from prenatal care, mental health, Medicaid, etc.).
- Autopsies are a critical part of complete records. The availability of autopsies would allow for improved understanding of the causes of and circumstances surrounding pregnancy-associated deaths.

BIRTHS AND MATERNAL DEATHS BY RACE

37% of all births in Louisiana in 2020 were to **non-Hispanic Black women**.[9] However, non-Hispanic Black women accounted for **62% of all pregnancy-associated deaths** that occurred in 2020.

Distribution of All Births

Distribution of Maternal Deaths

Distribution of All Births		Distribution of Maternal Deaths
14% — Other		3%
37% — Black		62%
49% — White		35%
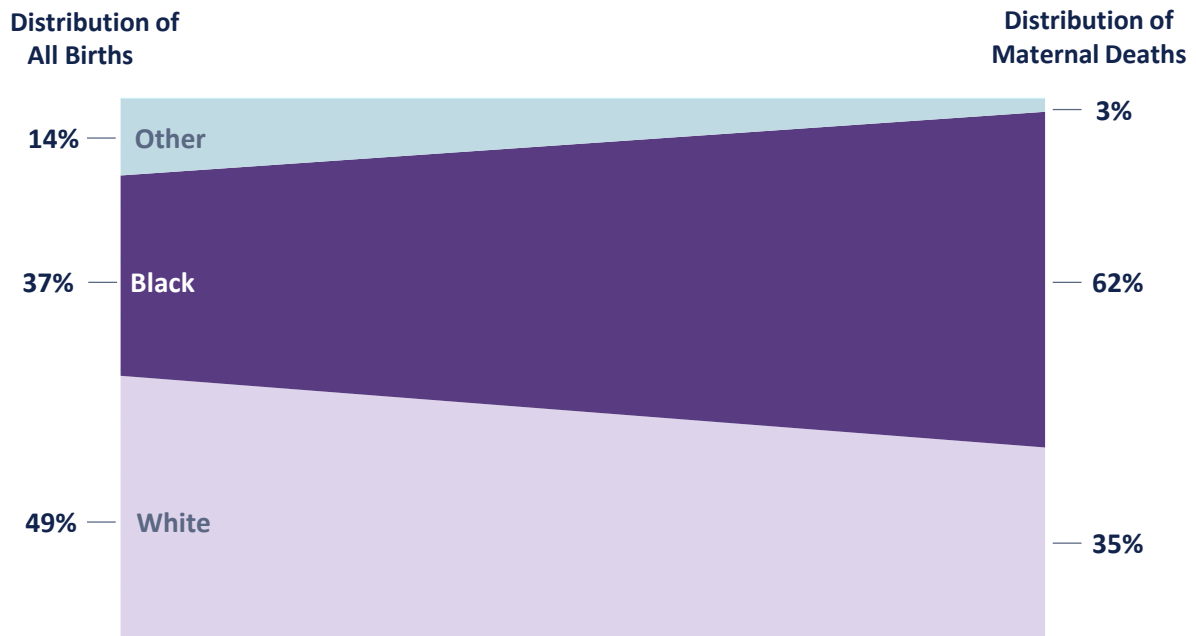
RACIAL & ETHNIC DISPARITIES IN ALL PREGNANCY-ASSOCIATED DEATHS

Pregnancy-Associated Mortality Ratio by Race (per 100,000 births)

- Non-Hispanic White: 104.0
- Non-Hispanic Black: 240.2
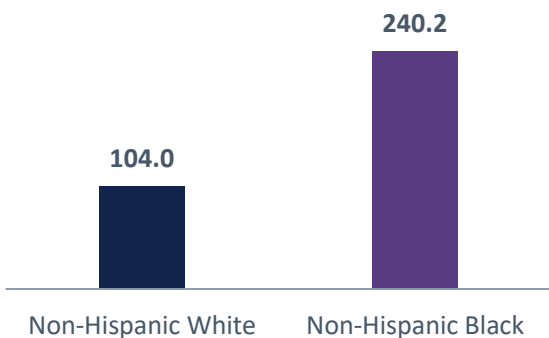
Black women in Louisiana were **2.5x more likely to die** than white women.

Key Points

- Non-Hispanic Black women represent a disproportionate number of deaths. In 2020, while Black women represented 37% of the births in Louisiana, they represented 62% of deaths.

Substantial racial & ethnic disparities exist among all pregnancy-associated deaths. These disparities are more prominent in pregnancy-related deaths.

DISPARITIES IN PREGNANCY-RELATED DEATHS

13 out of 15 pregnancy-related deaths in Louisiana were among Black women.

DISPARITIES IN PREGNANCY-ASSOCIATED, BUT NOT RELATED DEATHS

The overall ratio of *pregnancy-associated, but not related* deaths in Louisiana was 113.0 per 100,000 births.

Pregnancy-Associated, but Not Related Mortality Ratio by Race (per 100,000 births)

	169.5
93.2	
Non-Hispanic White	Non-Hispanic Black
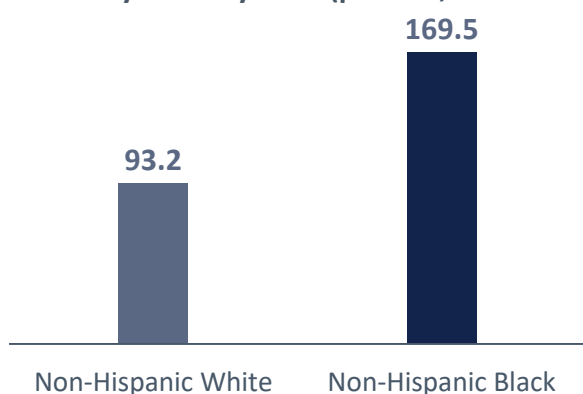
In pregnancy-associated, but not related deaths Black women in Louisiana were

almost twice as likely

to die as white women.

Key Points

- Black women accounted for 13 out of 15 *pregnancy-related* deaths. The top causes of *pregnancy-related* deaths were cardiomyopathy, cardiovascular conditions, infection and accidental overdose.
- For *pregnancy-associated, but not related* deaths, Black women died at almost twice (1.8 times) the rate of white women. Homicide was a top cause.

Maternal Demographics: All Pregnancy-Associated Deaths

INSURANCE TYPE

60% of women who died during or within a year of pregnancy in Louisiana had health insurance through **Medicaid**. Of note, the majority (61%) of Louisiana women who gave birth in 2020 had health insurance through Medicaid.

60%	8%	32%
Medicaid	**Commercial or Self-Pay**	**Other/Unknown**

MORTALITY RATIOS BY AGE (IN YEARS)

Mortality ratios below are deaths per 100,000 births in 2020.

< 25	25-29	30-34	35+
126.3	131.7	158.4	190.7

EDUCATION

12th Grade or Less; No Diploma 27%	High School Diploma or GED Completed 45%	Some College Credit 16%	12%

Associate's or Bachelor's Degree
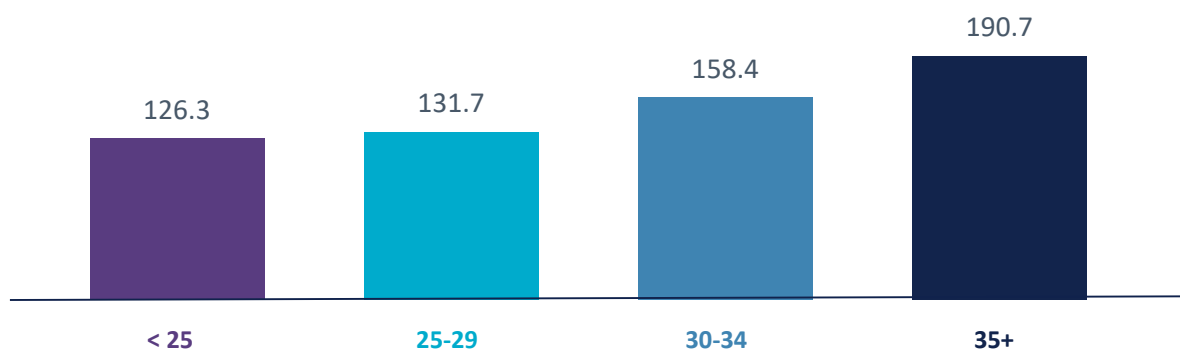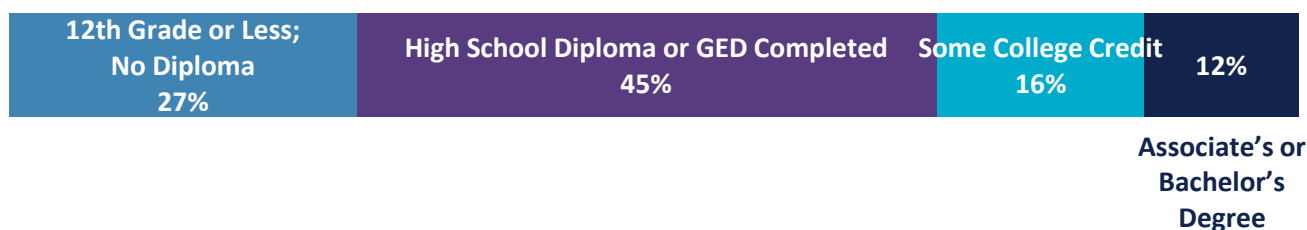
Key Points

- In 2020, Medicaid covered the majority of pregnancies and births in Louisiana. There is no disparity in pregnancy-associated deaths by insurance type, however, these findings represent opportunities to optimize services covered by Medicaid to ensure quality healthcare before, during, and after pregnancies, and to provide coordinated care between pregnancies to prevent pregnancy-associated deaths.
- Women with a **high school diploma/GED or less** accounted for **72%** of all pregnancy-associated deaths. Almost half of Louisiana women (48%) who gave birth in 2020 had a high school diploma/GED or less.
- The pregnancy-associated mortality ratio was highest among women ages **35 and older.**

The majority (76%) of all pregnancy-associated deaths occurred after delivery up to 1 year after pregnancy.

TIMING OF *PREGNANCY-RELATED* DEATHS

7%
While pregnant*

53%
Within 42 days of pregnancy*

40%
43 days to 1 year after pregnancy*

- There were **15 pregnancy-related** deaths.
- The majority of **pregnancy-related** deaths occurred **within 42 days of pregnancy.**

*Percentages based on counts fewer than 20 are considered unstable and should be interpreted with caution.

TIMING OF *PREGNANCY-ASSOCIATED, BUT NOT RELATED* DEATHS

30%
While pregnant

5%
Within 42 days of pregnancy

66%
43 days to 1 year after pregnancy
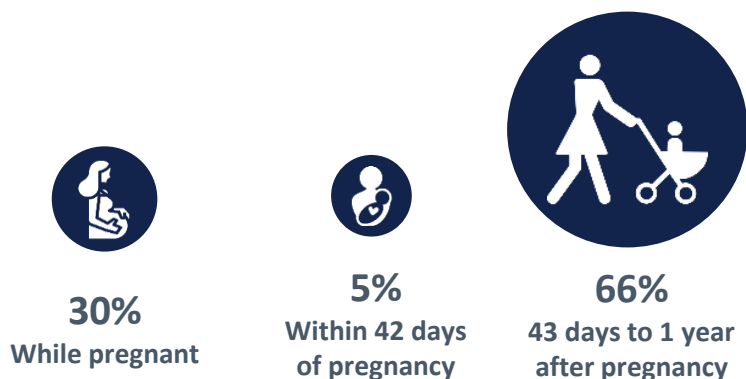
- There were **64 pregnancy-associated, but not related** deaths.
- The majority of **pregnancy-associated, but not related** deaths occurred from **43 days to 1 year after pregnancy.**

Key Points

- The majority (60%*) of *pregnancy-related* deaths occurred during or within 42 days of pregnancy.
- The percentage of *pregnancy-related* deaths occurring **while pregnant** has **decreased** when compared to previous reports.
- 66% of *pregnancy-associated, but not related* deaths occurred 43 days to 1 year after pregnancy.
- There were **3 pregnancy-associated, but unable to determine relatedness** deaths. 1 death occurred within 42 days of pregnancy while the other 2 deaths occurred within 43 days to 1 year after pregnancy. Causes of **pregnancy-associated, but unable to determine relatedness** deaths included accidental overdose and unknown cause of death.

Understanding Pregnancy-Related Deaths:
Causes and Contributing Factors (15 Deaths)

The overall ratio of *pregnancy-related* deaths in Louisiana was 26.2 per 100,000 births*.

The **top underlying causes** of **pregnancy-related** deaths were:

Cardiomyopathy
4 deaths

Cardiovascular Conditions
3 deaths

Infection
3 deaths

Accidental Overdose
3 deaths

94%
of pregnancy-related deaths were considered potentially preventable.*

Percentages based on counts fewer than 20 are considered unstable and should be interpreted with caution.

7%	87%	7%
No Chance	**Some Chance**	**Good Chance**

OBESITY, MENTAL HEALTH CONDITIONS AND SUBSTANCE USE

For each death, the committee determined whether obesity, mental health conditions and substance use disorder (as specified by the MMRIA Form — see Appendix C) contributed to each death.

	Obesity	Mental Health Conditions	Substance Use Disorder
No	53%	80%	73%
Yes	47%	20%	27%

■ Yes ■ No
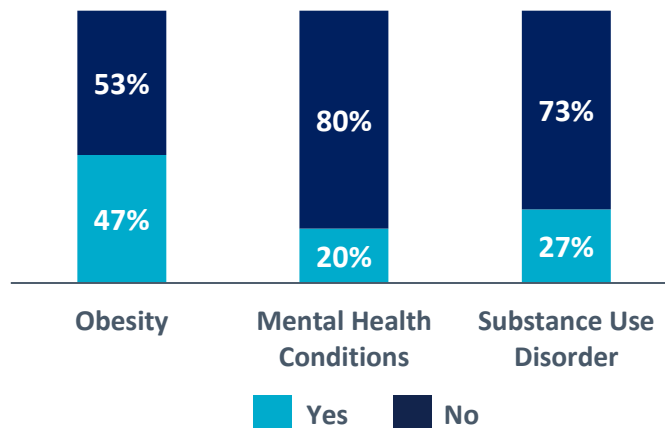
Key Points

- There were 15 **pregnancy-related** deaths, representing 18%* of all pregnancy-associated deaths, and the majority (94%*) were considered to be preventable.
- Among the deaths due to infection, two were related to COVID-19 and one was related to sepsis.
- Other causes of **pregnancy-related** deaths include thrombotic embolism and hemorrhage.
- **Obesity** was a contributing factor in **almost half (47%*)** of **pregnancy-related** deaths.

Understanding Pregnancy-Associated, but Not Related Deaths:
Causes and Contributing Factors (64 Deaths)

The overall ratio of *pregnancy-associated, but not related* deaths in Louisiana was 111.8 per 100,000 births.

The **top underlying causes** of **pregnancy-associated, but not related deaths** were:

Accidental Overdose	Homicide	Motor Vehicle Crash	Cancer
23 deaths	10 deaths	8 deaths	6 deaths

80% of pregnancy-associated, but not related deaths were considered potentially preventable.

19%	53%	27%	1%
No Chance	Some Chance	Good Chance	Unable to Determine

OBESITY, MENTAL HEALTH CONDITIONS AND SUBSTANCE USE

For each death, the committee determined whether obesity, mental health conditions and substance use disorder (as specified by the MMRIA Form – see Appendix E) contributed to each death.

Legend: Yes | No | Probably or Unknown

	Obesity	Mental Health Conditions	Substance Use Disorder
Probably or Unknown	1%	3%	1%
No	91%	83%	55%
Yes	8%	14%	44%

Key Points
- Overdose and homicide were the leading causes of **pregnancy-associated, but not related** deaths.
- Substance use disorder contributed to almost half (44%) of **pregnancy-associated, but not related** deaths.

Contributing Factors: All Pregnancy-Associated Deaths

Review committee members identified contributing factors to *pregnancy-associated* deaths using the MMRIA Committee Decisions Form (see Appendix C). Contributing factors include any behavior or systems issue which increase the severity of morbidity or the likelihood of mortality. These factors did not necessarily cause the fatal outcome but may have been among a number of factors that led to the death. Contributing factors can be analyzed to develop and guide quality improvement efforts.

Each contributing factor identified through review committee discussion was categorized into 1 of 5 levels – patient/family, provider, facility, system and community – and further disaggregated by class (see Appendix C for more details). Contributing factors are not mutually exclusive, and a death may have had more than one contributing factor.

- **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 locations 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 shares sense of place or identity – ranges from physical neighborhoods to a community based on common interests and shared circumstances

CONTRIBUTING FACTORS BY LEVEL AND CLASS

The committee identified **222** contributing factors across all levels for pregnancy-associated deaths, most of which were either **patient/family-, provider-, or facility-related**. The top three classes within each of the top contributing factor levels, along with representative themes is shown below. The count refers to the number of times a contributing factor was identified at the corresponding level.

Contributing Factor Class	Count	Representative Themes
Patient/Family Level		
Substance Use Disorder	36	Illicit drug use, alcohol use, multiple medications
Access/Financial	16	Barriers to accessing care (e.g., insurance, transportation)
Knowledge	15	Lack of knowledge of treatment or follow-up
Provider Level		
Continuity of Care/Care Coordination	5	Lack of or poor case coordination or management
Assessment	4	Failure to screen, inadequate assessment of risk
Clinical Skill/Quality of Care	3	Misdiagnosis, use of ineffective treatment
Delay	3	Delay in referring or accessing care or treatment
Facility Level		
Continuity of Care/Care Coordination	12	Lack of or poor case coordination or management
Clinical Skill/Quality of Care	4	Misdiagnosis, use of ineffective treatment
Referral	3	Failure to refer or seek consultation

The committee avoids victim blaming in the case reviews by understanding and framing recommendations as who has the power to prevent the factors that contributed to the death with the acknowledgement of structural barriers to accessing medical care and adherence to medical recommendations. The committee identified engaging patients and families in the care and treatment of the patient as an opportunity to improve outcomes.

From Data to Action

PAMR Committee Recommendations Overview

During the review of 2020 maternal deaths, the committee generated almost 200 individual recommendations for prevention. Committee reviews were guided by the CDC's MMRIA Committee Decisions Form (see Appendix C). This form asks committee members to use their expertise to answer the question "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?" Recommendations represent committee consensus following a thorough, multidisciplinary review of each case, as well as overall data and findings from all 82 deaths.

Recommendations are organized based on "who" can implement changes – healthcare professionals, healthcare systems, including hospitals and birthing facilities, social and local community organizations, policy makers, insurance payors, and government and public health agencies. Understanding that all individuals and systems must work together to improve maternal outcomes and reduce maternal mortality, individuals and organizations working at each of these levels can use these recommendations to inform and guide their efforts to improve maternal health outcomes. Specific recommendations for action are listed on the following pages.

Policy Makers

Insurance Payors

Social and Local Community Organizations

Preventing Maternal Mortality

Government and Public Health Agencies

Healthcare Systems

Healthcare Professionals

Based on the contributing factors identified during committee review of 2020 pregnancy-associated deaths, there were several overarching themes identified. These broad themes highlight priority areas to inform maternal mortality prevention efforts.

Seven overarching needs or themes emerged consistently throughout review:

1. **Address racial and cultural bias across the network of care that serves pregnant and postpartum women.**

2. **Identify and address social determinants of health (SDoH) to improve access to care and to decrease disparities in outcomes.**

3. **Improve provider screenings and assessments, specifically for substance use disorder, perinatal and postpartum mood and anxiety disorders (PMAD), intimate partner violence (IPV) and SDoH.**

4. **Improve patient and family centered care, including education on the warning signs and individual risk for maternal morbidity and mortality.**

5. **Improve care coordination before, during, and after pregnancy, including support for continued healthcare during the fourth trimester, or the first 12 weeks after birth.**

6. **Increase and improve harm reduction strategies.**

7. **Improve implementation of evidence-based guidelines for treating the leading causes of pregnancy-associated deaths, including substance use disorder.**

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Address racial and cultural bias across the network of care that serves pregnant and postpartum women.

Implicit bias and structural racism are at the root of all health disparities[10] and are particularly evident in our maternal outcomes.[11] Implicit bias can impact the ability of healthcare providers to give equitable care. Black women are less likely to receive adequate treatment for pain[12] and Black and Hispanic women report mistreatment from healthcare providers based on their race, ethnicity, and/or language preference.[13] Research shows that Black women have been described as aggressive or "angry."[14] Therefore, we must address implicit bias in all individuals who care for pregnant and postpartum women. In Louisiana, similar to national statistics, we see a disparity in outcomes for our Black mothers. In 2020, Black mothers were 2.5 times more likely than white mothers to experience a pregnancy-associated death.

For Healthcare Providers:

- Implicit bias may cause blind spots that prevent providers from appropriately recognizing the signs and symptoms of respiratory distress. Patients in respiratory distress often exhibit anxiety and restlessness as a sign of hypoxia. Healthcare providers must acknowledge and address their implicit bias that prevents them from providing equitable care.

For Government and Public Health Agencies:

- Licensing boards for healthcare professionals, including physicians, nurses, and other allied health professionals, should require implicit bias training for all healthcare providers as part of annual licensure renewal.

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Identify and address social determinants of health (SDoH) to improve access to care and to decrease disparities in outcomes.

Social determinants of health, including health quality and healthcare access, education access and quality, social and community context, economic stability, and the neighborhood and built environment, impact maternal mortality.[15,16] Historical structural racism has led to inequities in social determinants of health leading to worse health outcomes. Lack of childcare and lack of transportation are often cited as reasons for missed healthcare appointments or delaying care.[17] Lower socioeconomic status has been identified as a risk factor for poor maternal outcomes.[18] Each interaction with the healthcare system provides an opportunity to identify social determinants of health. The American College of Obstetricians and Gynecologists and the American Academy of Pediatrics recommend healthcare providers screen for social determinants of health.[19,20]

While screening is the first step, addressing social determinants of health is multifaceted and requires interventions within many systems. In 2020, 61% of the births in Louisiana were to mothers who have Medicaid as an insurance carrier creating the opportunity for system level change through Medicaid. For patients insured through Medicaid, accessing care can be challenging, especially if they have complex medical conditions requiring subspecialty care. There are few subspecialists that accept Medicaid as an insurance provider, in part, due to the low reimbursement in comparison to commercial insurance. Based on data in 2019, in the US, the Medicaid pay for service for physicians was nearly 30% below the Medicare payment rates and 22% below Medicare payment rates for hospitals.[21]

Addressing Social Determinants of Health

- Screening
- Connections to care and resources
- System level changes
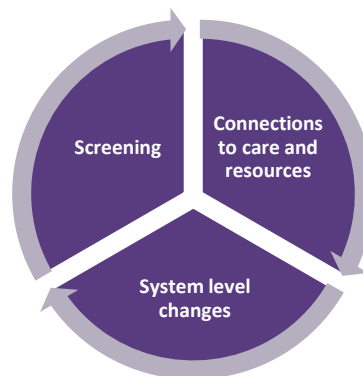
For Healthcare Providers:
- When social determinants of health such as lack of transportation or childcare are identified as barriers to care, healthcare providers and social workers and/or care coordinators should connect patients to alternative models of care, such as home visiting programs, as a way to bring care to the patient.
- In accordance with recommendations from the American Academy of Pediatrics, pediatricians should screen for social determinants of health, such as safe housing, during each well child visit and connect patients who screen positive to resources.

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Identify and address social determinants of health (SDoH) to improve access to care and to decrease disparities in outcomes.

For Healthcare Systems, Hospitals and Birthing Facilities:

- Healthcare systems, hospitals, and birthing facilities should ensure that at the time of scheduling appointments, patients undergo screening for social determinants of health to identify and address barriers to care such as transportation and childcare, especially for patients who frequently miss appointments. To address transportation barriers for patients with high-risk medical conditions and under-accessed rural areas, health systems should utilize telehealth to coordinate multidisciplinary specialty care, including cardiology, maternal fetal medicine, and neurology.
- Obstetric and postpartum patients should undergo social determinants of health screening while in the emergency department. Healthcare systems, hospitals, and birthing facilities should embed social workers in emergency departments to connect patients to resources, including safe housing.

For Policymakers:

- Federal, state and local governments should develop a range of policies that support equitable and affordable childcare options.
- Policy makers should legislate for the minimum wage to be a living wage, as well as address the gender pay gap in the state.
- To improve access and increase the number of subspecialists (i.e. gastroenterologists, cardiologists, psychiatrists) caring for obstetric patients insured by Medicaid, Medicaid funding should be increased by federal and state policymakers, specifically to increase reimbursement to providers.

For Payors and Insurance Carriers:

- Because Medicaid is a state policy, when patients travel to a state that is not their home residence, they do not have coverage, which becomes a barrier to antepartum care. **The Centers for Medicare and Medicaid Services should create policy that allows pregnant patients with Medicaid to have continued coverage across state lines to prevent interruptions in care, especially during public health emergencies and natural disasters.**
- For Louisiana Medicaid (LaMOMS), it can take up to 45-days after an application is received to be notified of acceptance, however, coverage can be retroactive up to 3 months prior to the receipt of the application. This may not be well known by patients or providers causing a delay in care. **Because of the need to enter care, Louisiana Medicaid should provide temporary insurance cards while Medicaid benefits are being approved so patients can access care.**

PRIORITY AREA FOR PREVENTION: Identify and address social determinants of health (SDoH) to improve access to care and to decrease disparities in outcomes.

For Public Health Agencies:

- As a patient-centered approach to care, federal and state public health agencies should expand funding and support for home visiting programs during pregnancy and throughout the postpartum period for patients with social determinants of health that impact their ability to access care.

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Improve provider screenings and assessments, specifically for substance use disorder, perinatal and postpartum mood and anxiety disorders, and intimate partner violence.

In review of maternal deaths in Louisiana in 2020, "failure to screen" contributed to 7% of the deaths. Screening is the first step in identification of needed services and positive screenings should lead to service referrals to facilitate linkages to care and treatment for improved health outcomes. Recognizing that a caring and nonjudgmental approach can increase the likelihood of disclosure, the American College of Obstetricians and Gynecologists recommends that screening for substance use be a part of comprehensive obstetric care.[22] Universal verbal screening using a validated screening tool decreases stigma and bias. In 2020, the PAMR Committee concluded mental health conditions contributed to 17% of pregnancy-associated but not related deaths and 12% of pregnancy-associated but unable to determine pregnancy-relatedness. Understanding the relationship between substance use disorder and mental health conditions, screening for substance use as well as mental health conditions could decrease the number of deaths related to substance use.

In 2020, homicide was the second leading cause of pregnancy-associated, but not related deaths, and SDoH were a contributing factor in at least 17% of cases, highlighting not only the need to screen for SDoH but also intimate partner violence (IPV). Screening for IPV should be part of comprehensive women's health visits.[23] Because of the intimate relationship that patients have with their obstetric care provider, these providers are optimally positioned to screen for IPV.

Adverse childhood experiences (ACEs) are linked to chronic health problems, mental illness, and substance use disorder. Screening partnered with trauma-informed care during obstetrical care can improve outcomes.[24]

For Healthcare Providers:
- Healthcare providers, including obstetric care providers, should ensure patients receive substance use screening using a validated verbal screening tool as part of comprehensive medical care. When patients screen positive, providers should refer patients through a warm handoff to mental health and/or substance use providers who can assist patients in developing safety plans that include a risk mitigation strategy.
- Healthcare providers should use validated screening tools to assess for IPV and community safety. Regardless of screening results, universal education that addresses healthy relationships should be provided to all patients.
- Healthcare providers should be aware of and evaluate for ACEs and assist with appropriate referrals for care.

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Improve patient and family centered care, including education on the warning signs and individual risk for maternal morbidity and mortality.

Patient- and Family-Centered Care is defined as "an approach to planning, delivery, and evaluation of health care that is grounded in mutually beneficial partnerships among healthcare providers, patients, and families."[25] Educating patients and their families is the first step in patient partnership and empowering them to take part in their healthcare. In review of the 2020 pregnancy-associated deaths in Louisiana, patient and/or family knowledge was a contributing factor in at least 12% of deaths.

For Healthcare Providers:

- Women of reproductive age should undergo reproductive/preconception counseling during annual exams. **Patients at high-risk for severe maternal morbidity due to medical comorbidities should receive comprehensive counseling that includes reproductive management options, including long-acting reversible contraception.**
- According to systematic review, approximately 40% of women do not attend a postpartum visit.[26] The postpartum visit provides an opportunity to manage chronic health conditions, educate on healthy behaviors, and provide access to effective contraception. **Providers should educate patients on the purpose and importance of the postpartum visit to allow patients to see the value in these visits.**

For Healthcare Systems, Hospitals and Birthing Facilities:

- To provide an optimal patient-physician relationship, providers must be knowledgeable of all situations that may impact a patient's health. The American Medical Association Code of Medical Ethics has developed Patient Responsibilities, which states "patients contribute to the collaborative effort when they are truthful and forthcoming with their physicians and strive to express their concerns clearly. Physicians likewise should encourage patients to raise questions or concerns."[27] **To create awareness for patients and providers, healthcare systems, hospitals, and birthing facilities should distribute educational materials and post signage delineating patients' responsibility to disclose all medical and social issues to optimize care and treatment.**

PAMR Committee Recommendations

⚠️ **PRIORITY AREA FOR PREVENTION: Improve patient and family centered care, including education on the warning signs and individual risk for maternal morbidity and mortality**.

For Public Health Agencies:

- Public health agencies should create public health messaging campaigns to inform patients and families about the signs and symptoms of potential severe outcomes during pregnancy and the postpartum period.
- Public health agencies should create public health messaging campaigns to educate the community on substance use as a cause of impaired driving.
- Public health agencies should develop public health messaging campaigns to inform the public on the effects of substance use, including marijuana, in pregnancy.
- Public health agencies should create public health messaging campaigns to create awareness in the community about home visiting programs such as Nurse Family Partnership, Parents as Teachers, and Healthy Start.
- Public health agencies should create public health messaging campaigns, using best practices in communication science, to address firearm safety and discouraging the use of firearms by underage individuals.
- Public health agencies should develop public health messaging campaigns to educate the community on the forms of distracted driving, mitigation techniques, and consequences of distracted driving.

PRIORITY AREA FOR PREVENTION: Improve care coordination before, during, and after pregnancy, including support for continued healthcare during the fourth trimester, or the first 12 weeks after birth.

The Agency for Healthcare Research and Quality defines care coordination as "deliberately organizing patient care activities and sharing information among all of the participating concerned with a patient's care to achieve safer and more effective care."[28] Care coordination is particularly important for patients with substantial social barriers, complex medical conditions, and those impacted by mental health conditions and/or substance use disorder. In review of deaths related to substance use disorder, the committee found many of the women received little to no prenatal care and often presented to the emergency department during pregnancy or in labor. Additionally, the number of substance use related visits to the emergency room is increasing.[29] This presents an opportunity to not only begin treatment, but to coordinate and facilitate obstetrical care for those patients without an obstetric provider. Peer navigators have been proven to be beneficial in improving outcomes for patients with substance use disorder and with perinatal mood and anxiety disorders (PMAD).[30] Care coordination also includes ensuring pregnant women receive the appropriate level of care based on the complexity and severity (acuity) of their medical issues and risk factors present. Health complications during labor, delivery, and the year after birth are more likely to occur when medically high-risk patients are cared for at facilities designed to serve patients who do not experience severe illness or injury (i.e. low-acuity patients).[31]

For Healthcare Providers:
Care coordination for patients with complex medical conditions:

- Consistent with the recommendation from the American College of Obstetricians and Gynecologists[32], all postpartum patients should be given a 2-week postpartum visit to assess for physical, emotional, and mental well-being. These visits should be covered by insurance providers and encouraged by healthcare providers.
- Healthcare providers, with the support of healthcare systems, hospitals, and birthing facilities, should perform a risk assessment on patients when admitted to birthing facilities to ensure they are cared for at the facility that is appropriate for their level of risk.
- Obstetric healthcare providers should assess a patient's risk for complications on entry to prenatal care. Patients who are risk-stratified as high should be cared for by an obstetrician and/or maternal fetal medicine physician. Additionally, when patients have medical conditions that put them at high-risk for severe maternal morbidity or maternal mortality, other non-obstetric providers, such as cardiologists should be consulted to ensure comprehensive , risk appropriate, coordinated care.
- As part of maintenance of certification, obstetric providers should be required to demonstrate knowledge of the standard of care for venous thromboembolism (VTE) prevention for obstetric patients who are at risk for thrombolytic events and have a high suspicion of pulmonary embolism during pregnancy and the postpartum period.

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Improve care coordination before, during, and after pregnancy, including support for continued healthcare during the fourth trimester, or the first 12 weeks after birth.

For Healthcare Providers:

Care coordination for patients with mental health or substance use disorders:

- Women with mental health conditions that require pharmacological therapy may need to continue medication during pregnancy. Decisions regarding psychotropic medications should consider the pregnant individual's needs and the impact of the medication on the fetus.[33] While the American College of Obstetricians and Gynecologists recommends obstetricians initiate therapy for some mental health conditions, other conditions may be more complex and require care from a psychiatrist. **Because pregnant patients with a history of psychiatric illnesses need coordinated care for medication management during pregnancy, obstetric healthcare providers should consult with psychiatrists to ensure continuity of care.**
- When substance use disorder is identified in patients, obstetric care providers should work with social workers and community health workers in a collaborative manner to assist patients in accessing rehabilitation facilities through warm handoffs.

For Healthcare Systems, Hospitals and Birthing Facilities:

Care coordination for patients with complex medical conditions:

- As healthcare systems, hospitals, and birthing facilities implement various models of care, they should develop a process to ensure that when patients are cared for by a hospital-based provider, those patients have discharge plans that include an appointment with a clinic-based provider. This is particularly important for patients who deliver an infant in the hospital setting but did not have prenatal care.
- Obstetric patients with complex medical conditions, including COVID-19, require specialized care. As such, healthcare systems should organize systems of care to ensure patients with complex illnesses are cared for by a multidisciplinary team to ensure collaboration and coordinated care. This should include ensuring that patients with complex conditions are treated at facilities with obstetricians and critical care providers in the same facility.
- Cardiomyopathy and cardiovascular conditions were the leading cause of pregnancy-related deaths in Louisiana in 2020. **Healthcare systems, hospitals and birthing facilities should put systems into place to ensure that patients at risk for cardiac events in pregnancy are referred to appropriate care providers and that those referrals are completed. Payors should use care coordinators to ensure referrals to appropriate care providers are completed.**
- Emergency departments (ED) should have peer support navigators embedded in the ED to facilitate coordination of care to outpatient services.

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Improve care coordination before, during, and after pregnancy, including support for continued healthcare during the fourth trimester, or the first 12 weeks after birth.

For Healthcare Systems, Hospitals and Birthing Facilities:

Care coordination for patients with mental health or substance use disorders:

- For patients with perinatal mood and anxiety disorders and/or SUD who are treated in the inpatient setting, referral and support plans should be arranged prior to discharge from the hospital to ensure continuity of care when transitioning to the outpatient setting.
- Peer workers provide support to people in recovery through education, advocacy, resource sharing, and mentoring.[34] **Healthcare systems and hospitals, including those with inpatient facilities that treat substance use disorder, should have care coordinators or peer navigators embedded in hospitals to assist with the transition to outpatient care and ensure continuity of care upon discharge from the hospital. Care can be achieved through various models that bring care to the patient, such as home visiting programs.**
- When pregnant women are discharged from inpatient facilities for substance use disorder or other mental health disorder treatment, care coordinators within those facilities should coordinate with the patient's obstetrician and arrange for outpatient home visiting mental health programs to ensure continuity of care.
- When obstetric patients, including those with substance use disorder, are cared for in outpatient settings such as Labor and Delivery triage, ED, and urgent care, follow-up appointments should be made prior to discharge and not made the patient's responsibility. This should include scheduling appointments for patients not already connected to obstetric care.
- Because of the increasing number of cases of SUD in pregnancy, birthing facilities should co-locate behavioral health specialists into obstetric practices to facilitate brief intervention and referral to treatment for women who screen positive for SUD.

For Payors and Insurance Carriers:

- Payors and insurance providers should ensure pregnant patients receive a care coordinator during and after pregnancy and patients are enrolled in a home visiting program. Payors and insurers should also utilize care coordinators to ensure there is follow through of referrals made by providers.

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Increase and improve harm reduction strategies.

Harm reduction is "a strategy directed toward individuals or groups that aims to reduce the harms associated with certain behaviors."[35] Harm reduction strategies that include harm prevention, risk reduction and health promotion are vital pieces to the patient care continuum. The Louisiana Department of Health's Harm Reduction Distribution Hub provides education and trainings, and materials for harm reduction. Through April 2023, 2,328 overdoses were reversed using portal naloxone, 18,168 naloxone kits, and 15,349 Fentanyl testing strips were distributed. Emergency departments provide additional opportunities to implement harm reduction strategies. Many emergency departments across the US have implemented processes to distribute naloxone to patients who are at risk for overdose that are discharged from the ED.[36]

Although harm reduction strategies have typically been associated with substance use, the term can be applied to any behavior or decision with negative consequences associated with them.[37] Harm reduction includes reducing the number of deaths related to motor vehicle collisions. The National Highway Traffic Safety Administration defines distracted driving as "any activity that diverts attention from driving, including talking or texting on your phone, eating and drinking, talking to people in your vehicle, fiddling with the stereo, entertainment or navigation system".[38] In 2021, across the US, 3,522 people died due to distracted driving. In Louisiana, between 2009-2018, 2,349 people were killed in motor vehicle collisions (MVC) involving alcohol, a rate of 4.6 per 100,000 population compared to the US rate of 3.2 per 100,000. MVC's were the third leading cause of pregnancy-associated but unrelated deaths in Louisiana in 2020.

For Healthcare Providers:
- The postpartum period is a time of increased vulnerability for women in recovery from substance use disorder and they are likely to relapse in the postpartum period.[39] The stress of parenting in the immediate postpartum period, among other things, can be a trigger for reuse and substance use disorder. As such, providers should perform harm reduction education for patients and their families during discharge from birthing facilities and connect patients to peer support navigators before discharge from the hospital.
- MVCs were one of the leading causes of pregnancy-associated, but not related deaths in 2020. According to the National Highway Traffic Safety Administration, wearing a seatbelt can reduce the risk of fatal injury in a car accident by 45-60%.[40] As part of routine prenatal care, healthcare providers should educate on the importance of wearing a seatbelt to reduce the risk of death during an MVC.

For Healthcare Systems, Hospitals and Birthing Facilities:
- When patients are seen in the ED for an overdose, facilities should provide naloxone take home kits and educate patients and their family on the use of naloxone.
- When patients who have experienced a traumatic event such as a sexual assault or domestic violence are seen in the ED, they should be referred to trauma therapy.

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Increase and improve harm reduction strategies.

For Policymakers:

- Federal regulation should require mandatory safety checks, including breathalyzers and seat belt checks, before a vehicle is able to be started.
- Federal and state policymakers should increase enforcement and the severity of penalties for drug- and alcohol-impaired driving that does not result in a fatality, including increased penalties for the first time there is an offense for driving under the influence.
- State policymakers should create legislation that penalizes aggressive drivers.
- State policymakers should adopt "Red Flag Laws" that require mandatory surrender of firearms for all persons who present to be a danger to themselves or others, including people with a documented history of domestic abuse.
- State policymakers should pass legislation requiring the completion of a gun safety course and a waiting period between applying for a firearm license and being able to purchase a gun, with longer waiting periods for people with a documented history of psychiatric illness.

For Government and Public Health Agencies:

- State and local public health agencies should create public health messaging campaigns to educate individuals with SUD and their families on substance use prevention and recovery. To mitigate the impact of SUD, messaging should include the availability and use of naloxone. These efforts should target low resource and rural communities.
- State and local public health agencies should fund harm reduction initiatives that provide naloxone take-home kits that can be given to patients with known SUD when being discharged from emergency departments, hospitals, or birthing facilities.
- State and local public health agencies should create public health messaging campaigns to educate on harm reducing strategies such as the use of Fentanyl strips, not using drugs alone, and providing access to naloxone.
- Because of the increased rate of fentanyl laced street drugs, state and local public health agencies should expand the Harm Reduction Task Force and efforts to ensure increased access to risk mitigation strategies, such as use of Fentanyl strips, not using drugs alone and providing access to naloxone.

PRIORITY AREA FOR PREVENTION: Improve implementation of evidence-based guidelines for treating the leading causes of pregnancy-associated deaths, including substance use disorder.

Since 2018, the Committee has identified SUD as a leading cause of pregnancy-associated deaths in Louisiana. In 2020, SUD contributed to 41% of maternal deaths and mental health conditions contributed to 18% of deaths. Stigma and bias against individuals with substance use disorder serve as significant barriers to accessing care.[41]

The White House Blueprint for Addressing the Maternal Health Crisis has also identified the need to strengthen support and access to substance use disorder treatment in the perinatal period by partnering with community-based organizations to ensure patient-centered, unbiased care.[42] Using evidence-based practice reduces variations in practice, enhances quality of care, and improves patient outcomes.[43] Implementing evidence-based care begins with education on the recommendations for best practice, including the use of medication assisted therapy (MAT) as the standard of care for opioid use disorder.[44] The Alliance for Innovation on Maternal Health provides several evidence-based patient safety bundles that are designed to improve readiness, recognition and prevention, and response to the leading causes of maternal mortality.[45] The Louisiana Perinatal Quality Collaborative works with birthing facilities in Louisiana to implement these patient safety bundles. Criminalization of individuals who use substances interferes with the patient-provider relationship, increases fear in individuals who use substances, and ultimately becomes a barrier to seeking and providing care. Additionally, these practices have been shown to be ineffective in improving rates of SUD in pregnancy.[46]

For Healthcare Systems, Hospitals and Birthing Facilities:

- Reducing stigma towards individuals who use substances is largely addressed by creating a culture of acceptance of those individuals. One of the first steps in addressing stigma is normalizing destigmatizing language.[47] To address stigma, healthcare settings should display stickers and signage that uses destigmatizing language regarding substance use disorder.
- Rehabilitation programs should use an evidence-based approach and prescribe buprenorphine more often than daily in order to increase compliance and address barriers to care.
- Inpatient and outpatient substance use disorder treatment facilities should implement evidence-based practices to treat pregnant women with SUD, including the use of MAT instead of abstinence.
- Facilities should have policies in place that support rooming-in of substance-exposed newborns and their mothers, minimizing separation from postpartum parents with substance use disorder. These policies optimize using the parent as "medicine," keeping the dyad together and optimizing non-pharmacologic methods for managing the substance exposed newborn at risk for neonatal abstinence syndrome/neonatal withdrawal syndrome.

PAMR Committee Recommendations

PRIORITY AREA FOR PREVENTION: Improve implementation of evidence-based guidelines for treating the leading causes of pregnancy-associated deaths, including substance use disorder.

For Government and Public Health Agencies:

- The Office of Behavioral Health should work with inpatient SUD treatment facilities to educate and assist with implementation of evidence based best practices for treating pregnant women with SUD.
- Against best practice guidelines from the American College of Obstetricians and Gynecologists (ACOG) and the American Society of Addiction Medicine (ASAM), many providers discontinue psychiatric medications during pregnancy. ACOG and ASAM should collaborate to improve education of obstetric and psychiatric providers on continuing psychiatric medications during pregnancy as a best practice.
- As part of continuing medical education, the Louisiana State Board of Medical Examiners (LSBME) should create educational requirements for providers on evidence-based practices for treating pregnant women with substance use disorder, including the use of MAT as the recommended first-line therapy.
- National professional organizations such as ACOG, American Medical Association (AMA), ASAM and American Academy of Family Physicians (AAFP) should educate providers caring for obstetric patients with SUD. This education should include the use of MAT, harm reduction strategies for patients including setting limits on where and when one uses drugs, avoiding driving or making important decisions while using, and making a parenting plan before using.
- All healthcare providers should receive bias training through their professional societies to help them recognize, acknowledge, and address their implicit bias towards individuals who use substances in order to reduce stigma.
- More licensed behavioral health providers certified in perinatal mood disorders are needed to treat these disorders. State and federal governments should develop programs to incentivize and recruit perinatal behavioral mental health providers, including subsidizing the cost for certification, for providers who agree to practice in underserved areas.
- The LSBME should require emergency and obstetric providers to complete annual education regarding recognition of signs, symptoms, and treatment of hypertensive disorders of pregnancy. Emergency and obstetric providers should be aware of the patients that are at higher risk for hypertensive disorders of pregnancy and manage their treatment using evidence-based guidelines.

OPH-BFH acts as the hub for LDH's efforts to prevent maternal deaths. These efforts are linked to our state surveillance, informed by the PAMR process, as well as national trends and the work from the Alliance for Innovation on Maternal Health (AIM) and the CDC. Below are selected state-level activities to reduce maternal mortality and morbidity and not inclusive of all ongoing community, facility and systems level efforts across the state.

The work within OPH has focused in three interconnected areas:
- **Ensuring effective public health systems** to monitor maternal outcomes and system improvements
- **Supporting change** within clinical care and related systems
- **Development and implementation of policies** that enable or support a strong system of care

Monitoring Maternal Outcomes

Policies that Support a Strong System of Care

Supporting Clinical and Systems Change
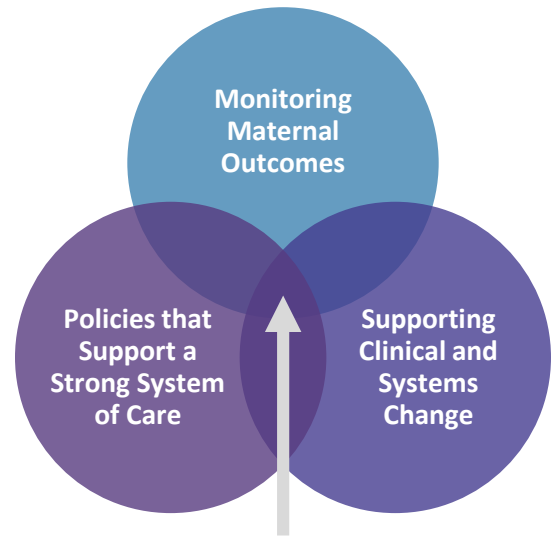
Preventing Maternal Mortality

Monitoring Maternal Outcomes

- **LA-PAMR launched its enhanced multidisciplinary review process in 2018**, in alignment with national best practices promoted by the CDC. In 2019, Louisiana was one of 25 states to receive funding under the CDC's Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) Program. The PAMR committee was expanded to ensure representation from a variety of geographic regions and fields of expertise and increased inclusion of women and people of color.
- **Louisiana Pregnancy Risk Assessment Monitoring System (PRAMS)** is an ongoing, population-based surveillance system designed to describe maternal behaviors and experiences that occur before, during and immediately following pregnancy. Information collected by PRAMS is used by health professionals, policy makers and researchers to develop and modify programs and policies designed to improve the health of women and infants. For more information, visit partnersforfamilyhealth.org/prams.
- **The Violence and Injury Prevention Program** works to prevent injuries and violence, which are the leading causes of death for residents ages 1–44 years. The program collects data on top causes of intentional and unintentional injuries across the state to inform program and policy initiatives. Priority areas include: traffic related crashes, sexual and Intimate Partner Violence (IPV), child abuse and neglect, traumatic brain injury (TBI), homicide, suicide, firearm, fire, drowning, older adult falls and infant sleep-related injuries. For more information, visit partnersforfamilyhealth.org/injury.
- **The Louisiana Domestic Abuse Fatality Review (DAFR)** was established in 2021 per Louisiana Revised Statute 40:2024.1-2024.6 with the aim of identifying the causes of domestic abuse fatalities and methods for prevention. Through a comprehensive and multidisciplinary review of domestic abuse fatality cases at both the state and local levels, this review committee works to identify and characterize the scope and nature of domestic abuse fatalities, including those that are pregnancy-associated, in order to take action to prevent future fatalities.

Supporting Clinical and Systems Change

- **Louisiana Maternal, Infant and Early Childhood Home Visiting (LA MIECHV)** provides family support and coaching through two evidence-based home visiting models: Nurse-Family Partnership (NFP) and Parents as Teachers (PAT). These services pair families with registered nurses or parent educators who provide personalized education, support and coaching, and referrals to services to empower families to reach their goals. For more information, visit **partnersforfamilyhealth.org/miechv**.
- **The Louisiana Perinatal Quality Collaborative (LaPQC)** is an initiative of the Bureau of Family Health and an authorized agent of the Louisiana Commission on Perinatal Care and Prevention of Infant Mortality. The LaPQC is a network of voluntary perinatal care providers, public health professionals, and patient and community advocates who work to advance equity and improve outcomes for families in Louisiana. Using improvement science methods, the LaPQC works with partners to implement evidence-based best practices that promote safe, equitable, and dignified patient-centered care for all individuals who give birth in Louisiana. Currently, the LaPQC has four initiatives:
    - Safe Births Initiative (SBI): Launched in 2021, SBI's goal is to strengthen processes to improve outcomes related to hemorrhage and hypertension and lower the first-time, low-risk Cesarean section birth rate
    - The Gift: Launched in 2006 and joining the LaPQC in 2018, the goal of The Gift to improve breastfeeding and infant feeding by implementing internationally recognized best practices
    - Improved Care for the Substance Exposed Dyad (ICSED): Launched in 2021, ICSED initiative is focused on improving care for individuals giving birth and neonates affected by substance use
    - Caregiver Perinatal Depression Screening (CPDS): The CPDS Learning Collaborative is focused on perinatal depression screening in pediatric practices and connecting caregivers who screen positive to appropriate resources.
    - For further information, please visit **lapqc.org**.
- **Louisiana Mental Health Perinatal Partnership (LAMHPP)** is a provider-to-provider consultation system for licensed healthcare clinicians serving pregnant and postpartum women and their families, including OB-GYNs, family physicians, pediatricians, nurse practitioners, nurse midwives, psychiatrists, psychologists, licensed clinical social workers and others. LAMHPP supports healthcare clinicians to address the needs of their patients including perinatal depression, anxiety, substance use disorders, interpersonal violence, and related health risks and conditions. For more information, and to register for the provider-to-provider consultation line, visit **lamhpp.org**. After registration, call (833) 721-2881 to request a consult.
- **Reproductive Health Program (RHP)** is the state's sole grantee of the Title X Family Planning Services Grant (Title X). Title X is the only federal program dedicated to providing access to high-quality contraceptive services, supplies and information to anyone who needs or wants them. RHP administers this program through a network of statewide service sites, including over 60 Parish Health Units and community health centers. All services are comprehensive and confidential, prioritizing patient autonomy, voluntary provision of services and patient-centered care. For more information, visit **HealthyChoicesLA.org**.

Policies that Enable or Support a Strong System of Care

- **LDH hosted the inaugural Maternal Mortality Summit in August 2019.** The summit was part of the response to **House Resolution 294** of the 2019 Regular Session. The Maternal Mortality Summit convened public health professionals, providers, policymakers and community leaders focused on improving birth outcomes. Recommendations from the Summit can be found in the **report here**.
- **Act 497 (2018 Legislative Session)** created the Healthy Moms, Healthy Babies Advisory Council. This council, authorized by Louisiana Revised Statute 40:2018.5 in 2018, was formed as a call to action to ensure that state initiatives addressing maternal mortality and severe maternal morbidity include an equity focus informed by community. Key findings and recommendations are summarized in the council's **final report** issued in March 2021. To view Act 497, visit **legis.la.gov**.
- **House Bill 190 (2021 Legislative Session)** created the Doula Registry Board. The board is working on developing rules regarding a registry and registration criteria. Registered doulas will be eligible for insurance reimbursement.
- **House Concurrent Resolution 103 (2021 Legislative Session)** urged and requested all offices and agencies in the state of Louisiana whose responsibilities include working with new mothers, families and children, including LDH and local health authorities, to address the short-term and long-term impact of maternal depression and anxiety so that evidence-based preventative care, early identification, and treatment services are available and accessible statewide for all women, and adverse consequences in children and families can be prevented.
- **HCR 105 (2021 Legislative Session)** established the Louisiana Maternal Mental Health Task Force. This group will advance education and treatment and improve services relating to maternal mental health.
- **House Bill 784 (2022 Legislative Session)** provides for universal perinatal mood disorder screening by primary care doctors.
- **Senate Resolution 131 (2022 Legislative Session)** established the Study Commission for Maternal Health and Wellbeing. This commission focused on the issue of assisting mothers affected by substance use disorder.
- **Senate Concurrent Resolution 20 (2023 Legislative Session)** requests LDH to convene a task force to make recommendations regarding nursing involvement to improve maternal outcomes.

Appendices and References

A. 2022 PAMR Committee Members

Name	Role and Organization
Amanda Branch, MSN, APRN, CNM	Midwife, Ochsner Medical Center Baton Rouge
Angela Bradley-Byers, MN, APRN, FNP-C	Maternal Fetal Medicine/Perinatal Services, LCMC/Healthy Start
Bridget Gardner, RN	Director, Injury Prevention Program, University Medical Center
Cheri Johnson, RNC-OB, MSN	Director of Perinatal Services, Woman's Hospital
Dan Goodbee	Emergency Medical Services
Deborah St. Germain, DNP, RN-CEN	Sexual Assault Nurse Examiner, Jefferson Parish Coroner's Office
Demetrice Smith, FNP-C, CNM	Nurse Practitioner/Certified Nurse Midwife, Jefferson Parish WIC/Healthy Start
Emma Moscardini, MA	Graduate Student, Louisiana State University
Erin O'Sullivan, MD	Forensic Pathologist, Orleans Parish Coroner's Office
Eva Lessinger, LMSW	Director, New Orleans Family Justice Center
Floyd "Flip" Roberts, MD	Vice President of Clinical Affairs, Louisiana Hospital Association
Gabriella Pridjian, MD	Maternal Fetal Medicine, Tulane Hospital
Grace Lee, MD	Physician, Infectious Disease, Louisiana Department of Health
Heather Olivier, MS, PLPC, NCC, CCTP, PMH-C	Certified Perinatal Mental Health Counselor, Present Hope Counseling
Helen Hurst, DNP, RNC-OB, APRN-CNM	Department Head of Nursing, University of Lafayette Associate Dean of Nursing, Creighton University
Ivory Wilson, MA, LAC, CCDP-D, CCGC	Program Manager, Office of Behavioral Health, Louisiana Department of Health
Jane Martin, MD	Maternal and Fetal Medicine Fellow, Ochsner Health System
Jennifer Avegno, MD	Health Commissioner, City of New Orleans Emergency Medicine, University Medical Center
Johnnay Benjamin, MPH	Patient Advocate Representative
Jon Brazzel	Unit Commander QA/CQI Officer, Baton Rouge Emergency Medical Services
Julia Buckner, MD	Director, LSU Anxiety and Addictive Behaviors Laboratory and Clinic
Karli Boggs, MD	OB/GYN, Our Lady of the Lake Physician Group
Kerrie Redmond, MSN, RNC-OB	Perinatal Improvement Advisor, Louisiana Perinatal Quality Collaborative, Louisiana Department of Health

LOUISIANA DEPARTMENT OF HEALTH

A. 2022 PAMR Committee Members

Name	Role and Organization
Keith Carter	Area Manager, Airmethods
Lisa Freeman, JD	Executive Director, Louisiana Highway Safety Commission
Mariah Wineski, MS	Executive Director, Louisiana Coalition Against Domestic Violence
Marshall St. Amant, MD	Maternal Fetal Medicine, Woman's Hospital
Melissa Stainback, PhD	Region 5 Opioid Coordinator, Office of Public Health, Louisiana Department of Health
Mike Costello	State Emergency Medical Services
Mike Straney, MD	Emergency Medicine Physician, Terrebone General Medical Center
Murtuza "Zee" Ali, MD	Cardiology, Louisiana State University
Natasha Seals, PharmD	Opioid Pharmacist Coordinator, Office of Public Health, Louisiana Department of Health
Nelson Hollings	North Shore Regional Safety Coalition Coordinator, The Regional Planning Commission
Nikki Greenaway, APRN, FNP-C	Founder, Bloom Village
Nikolai Terebieniec	Emergency Medical Services
Raymond Tucker, PhD	Clinical Psychology, Louisiana State University
Robert Maupin, MD	Maternal Fetal Medicine, Louisiana State University Health Sciences Center New Orleans
Rodney Wise, MD	Medical Director, AmeriHealth Caritas
Scott Barrilleaux, MD	Maternal Fetal Medicine, Louisiana Commission on Perinatal Care and Prevention of Infant Mortality
Susan Green, MSN, RN	Director of Emergency Services, Ochsner Medical Center (Baton Rouge and Iberville)
Veronica Gillispie-Bell, MD, MAS, FACOG	Medical Director, Louisiana Perinatal Quality Collaborative and Pregnancy Associated Mortality Review, Louisiana Department of Health
Victoria Rodriguez, LPC, CCTP, NCC	Licensed Counselor, Revive Counseling and Consulting
Victoria Williams, RN, IBCLC	Doula, Birthmark Doula Collective
Whitney Storey, MS, PLPC, CBE	Licensed Perinatal Counselor Psychology Instructor, University of Louisiana at Lafayette
Zoe Larned, MD	Oncologist, Ochsner Medical Center

B. 2022 Regional MCH Coordinators and BFH Support Staff

Region	Staff
Region 1 MCH Coordinator	Kristy Ferguson, BSN, RN
Region 2 MCH Coordinator	Rachel Purgatorio, BSN, RN
Region 3 MCH Coordinator	Danielle Mistretta, BSN, RN
Region 4 MCH Coordinator	Debra Feller, BSN, RN
Region 5 MCH Coordinator	Jade Marler, RN, CIC
Region 6 MCH Coordinator	Kayla Livingston, BSN, RN
Region 7 MCH Coordinator	Shelley Ryan-Gray, BSN, RN
Region 8 MCH Coordinator	Sara Dickerson, BSN, RN
Region 9 MCH Coordinator	Martha Hennegan, RN
CDC Assignee	Lyn Kieltyka, PhD
Data Team Lead/Epidemiology Supervisor	Jane Herwehe, MPH
LaPQC Program Manager	Amy Ladley, PhD
PAMR Coordinator	Rachel Hyde, BSN, RN, MPH
Maternal Morbidity and Mortality Epidemiologist	Imani Evans, MPH
Perinatal Projects Coordinator	Keshia Holmes, PhD
Program Manager	Dionka Pierce, MPH

Page 1

MMRIA

MATERNAL MORTALITY REVIEW COMMITTEE DECISIONS FORM v22   1

REVIEW DATE

Month/Day/Year

RECORD ID #

COMMITTEE DETERMINATION OF CAUSE(S) OF DEATH

IF PREGNANCY-RELATED, COMMITTEE DETERMINATION OF UNDERLYING* CAUSE OF DEATH
Refer to page 3 for PMSS-MM cause of death list.

PREGNANCY-RELATEDNESS: SELECT ONE

☐ PREGNANCY-RELATED
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

☐ PREGNANCY-ASSOCIATED, BUT NOT-RELATED
A death during pregnancy or within one year of the end of pregnancy from a cause that is not related to pregnancy

☐ PREGNANCY-ASSOCIATED BUT UNABLE TO DETERMINE PREGNANCY-RELATEDNESS

ESTIMATE THE DEGREE OF RELEVANT INFORMATION (RECORDS) AVAILABLE FOR THIS CASE:

☐ COMPLETE
All records necessary for adequate review of the case were available

☐ SOMEWHAT COMPLETE
Major gaps (ie, information that would have been crucial to the review of the case)

☐ MOSTLY COMPLETE
Minor gaps (ie, information that would have been beneficial but was not essential to the review of the case)

☐ NOT COMPLETE
Minimal records available for review (ie, death certificate and no additional records)

DOES THE COMMITTEE AGREE WITH THE UNDERLYING* CAUSE OF DEATH LISTED ON DEATH CERTIFICATE?   ☐ YES   ☐ NO

TYPE	OPTIONAL: CAUSE (DESCRIPTIVE)
UNDERLYING*	
CONTRIBUTING	
IMMEDIATE	
OTHER SIGNIFICANT	

COMMITTEE DETERMINATIONS ON CIRCUMSTANCES SURROUNDING DEATH

	YES	PROBABLY	NO	UNKNOWN
DID OBESITY CONTRIBUTE TO THE DEATH?	☐	☐	☐	☐
DID DISCRIMINATION** CONTRIBUTE TO THE DEATH?	☐	☐	☐	☐
DID MENTAL HEALTH CONDITIONS OTHER THAN SUBSTANCE USE DISORDER CONTRIBUTE TO THE DEATH?	☐	☐	☐	☐
DID SUBSTANCE USE DISORDER CONTRIBUTE TO THE DEATH?	☐	☐	☐	☐

MANNER OF DEATH

	YES	PROBABLY	NO	UNKNOWN
WAS THIS DEATH A SUICIDE?	☐	☐	☐	☐
WAS THIS DEATH A HOMICIDE?	☐	☐	☐	☐

IF ACCIDENTAL DEATH, HOMICIDE, OR SUICIDE, LIST THE MEANS OF FATAL INJURY
☐ FIREARM
☐ SHARP INSTRUMENT
☐ BLUNT INSTRUMENT
☐ POISONING/OVERDOSE
☐ HANGING/STRANGULATION/SUFFOCATION
☐ FALL
☐ PUNCHING/KICKING/BEATING
☐ EXPLOSIVE
☐ DROWNING
☐ FIRE OR BURNS
☐ MOTOR VEHICLE
☐ INTENTIONAL NEGLECT
☐ OTHER, SPECIFY:
☐ UNKNOWN
☐ NOT APPLICABLE

IF HOMICIDE, WHAT WAS THE RELATIONSHIP OF THE PERPETRATOR TO THE DECEDENT?
☐ NO RELATIONSHIP
☐ PARTNER
☐ EX-PARTNER
☐ OTHER RELATIVE
☐ OTHER
☐ ACQUAINTANCE
☐ OTHER, SPECIFY:
☐ UNKNOWN
☐ NOT APPLICABLE

*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.
**Encompasses Discrimination, Interpersonal Racism, and Structural Racism as described on page 4.

Additional information about MMRIA can be found at reviewtoaction.org/implement/mmria#collapseThree-mmria

Page 2

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 (ie, treatment)
- **TERTIARY:** Reduces the impact or progression of what has become an ongoing contributing factor (ie, 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.)

Additional information about MMRIA can be found at reviewtoaction.org/implement/mmria#collapseThree-mmria

Page 3

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.

Hemorrhage (Excludes Aneurysms or CVA)
10.1 - Hemorrhage – Uterine Rupture
10.2 - Placental Abruption
10.3 - Placenta Previa
10.4 - Ruptured Ectopic Pregnancy
10.5 - Hemorrhage – Uterine Atony/Postpartum
        Hemorrhage
10.6 - Placenta Accreta/Increta/Percreta
10.7 - Hemorrhage due to Retained Placenta
10.10 - Hemorrhage – Laceration/Intra-Abdominal
        Bleeding
10.9 - Other Hemorrhage/NOS

Infection
20.1 - Postpartum Genital Tract (e.g., of the Uterus/
        Pelvis/Perineum/Necrotizing Fasciitis)
20.2 - Sepsis/Septic Shock
20.4 - Chorioamnionitis/Antepartum Infection
20.6 - Urinary Tract Infection
20.7 - Influenza
20.8 - COVID-19
20.10 - Pneumonia
20.11 - Other Non-Pelvic Infection (e.g., TB, Meningitis,
        HIV)
20.9 - Other Infection/NOS

Embolism - Thrombotic (Non-Cerebral)
30.1 - Embolism – Thrombotic (Non-Cerebral)
30.9 - Other Embolism (Excludes Amniotic Fluid
        Embolism)/NOS

Amniotic Fluid Embolism
31.1 - Embolism - Amniotic Fluid

Hypertensive Disorders of Pregnancy (HDP)
40.1 - Preeclampsia
50.1 - Eclampsia
60.1 - Chronic Hypertension with Superimposed
        Preeclampsia

Anesthesia Complications
70.1 - Anesthesia Complications

Cardiomyopathy
80.1 - Postpartum/Peripartum Cardiomyopathy
80.2 - Hypertrophic Cardiomyopathy
80.9 - Other Cardiomyopathy/NOS

Hematologic
82.1 - Sickle Cell Anemia
82.9 - Other Hematologic Conditions including
        Thrombophilias/TTP/HUS/NOS

Collagen Vascular/Autoimmune Diseases
83.1 - Systemic Lupus Erythematosus (SLE)
83.9 - Other Collagen Vascular Diseases/NOS

Conditions Unique to Pregnancy
85.1 - Conditions Unique to Pregnancy (e.g,
        Gestational Diabetes, Hyperemesis, Liver
        Disease of Pregnancy)

Injury
88.1 - Intentional (Homicide)
88.2 - Unintentional
88.9 - Unknown Intent/NOS

Cancer
89.1 - Gestational Trophoblastic Disease (GTD)
89.3 - Malignant Melanoma
89.9 - Other Malignancies/NOS

Cardiovascular Conditions (excluding cardiomyopathy, HDP, and CVA)
90.1 - Coronary Artery Disease/Myocardial Infarction
        (MI)/Atherosclerotic Cardiovascular Disease
90.2 - Pulmonary Hypertension
90.3 - Valvular Heart Disease Congenital and Acquired
90.4 - Vascular Aneurysm/Dissection (Non-Cerebral)
90.5 - Hypertensive Cardiovascular Disease
90.6 - Marfan Syndrome
90.7 - Conduction Defects/Arrhythmias
90.8 - Vascular Malformations Outside Head and
        Coronary Arteries
90.9 - Other Cardiovascular Disease, including CHF,
        Cardiomegaly, Cardiac Hypertrophy, Cardiac
        Fibrosis, Non-Acute Myocarditis/NOS

Pulmonary Conditions (Excludes ARDS-Adult Respiratory Distress Syndrome)
91.1 - Chronic Lung Disease
91.2 - Cystic Fibrosis
91.3 - Asthma
91.9 - Other Pulmonary Disease/NOS

Neurologic/Neurovascular Conditions (Excluding CVA)
92.1 - Epilepsy/Seizure Disorder
92.9 - Other Neurologic Diseases/NOS

Renal Disease
93.1 - Chronic Renal Failure/End-Stage Renal Disease
        (ESRD)
93.9 - Other Renal Disease/NOS

Cerebrovascular Accident (CVA) not Secondary to HDP
95.1 - Cerebrovascular Accident (Hemorrhage/
        Thrombosis/Aneurysm/Malformation) not
        Secondary to Hypertensive Disorders of
        Pregnancy

Metabolic/Endocrine
96.2 - Diabetes Mellitus
96.9 - Other Metabolic/Endocrine Disorders/NOS

Gastrointestinal Disorders
97.1 - Crohn's Disease/Ulcerative Colitis
97.2 - Liver Disease/Failure/Transplant
97.9 - Other Gastrointestinal Diseases/NOS

Mental Health Conditions
100.1 - Depressie Disorder
100.2 - Anxiety Disorder (including Post-Traumatic
        Stress Disorder)
100.3 - Bipolar Disorder
100.4 - Psychotic Disorder
100.5 - Substance Use Disorder
100.9 - Other Psychiatric Conditions/NOS

Unknown COD
999.1 - Unknown COD

Additional information about MMRIA can be found at reviewtoaction.org/implement/mmria#collapseThree-mmria

C. MMRIA Committee Decisions Form

Page 4

CONTRIBUTING FACTOR DESCRIPTIONS

LACK OF ACCESS/FINANCIAL RESOURCES
Systemic barriers, e.g., lack or loss of healthcare insurance or other financial duress, as opposed to noncompliance, impacted their ability to care for themself (e.g, 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 (i.e, 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 (e.g, 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 (e.g, 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 (i.e, uncoordinated or not comprehensive) among or between healthcare facilities or units, (e.g, 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, (e.g, 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 (e.g, 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 (e.g, 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 (e.g, 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 (e.g, 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 Ortique)

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 (e.g, 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 (e.g, long-term smoking led to underlying chronic lung disease).

TRAUMA
The individual experienced trauma: i.e, 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.

Additional information about MMRIA can be found at reviewtoaction.org/implement/mmria#collapseThree-mmria

D. Louisiana Bias or Racism and Social Determinants of Health (LABoRS) Tool

Demographics

Race, citizenship/immigration status, preferred language, educational level, marital status, living arrangements (living with friends, shelter, temporary housing, homelessness), type of insurance, WIC utilization, distance between place of birth/death from decedent's residence
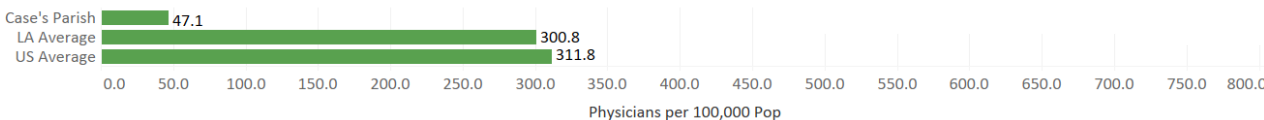
Social Determinants of Health

- **Barriers to healthcare**: child care, cultural norms, distance, financial, transportation, mobility
- **Barriers to communication:** hearing impaired, functional illiteracy, speech impaired, language differences, vision impaired, cultural differences
- **Social or emotional stress:** History of domestic violence, history of psychiatric hospitalizations or treatment, child protective services involvement, history of substance use, unemployment, pregnancy unwanted, recent trauma, prior suicide attempts, adverse childhood experiences, history of incarceration, housing instability, social support, chronic illness, short interpregnancy interval
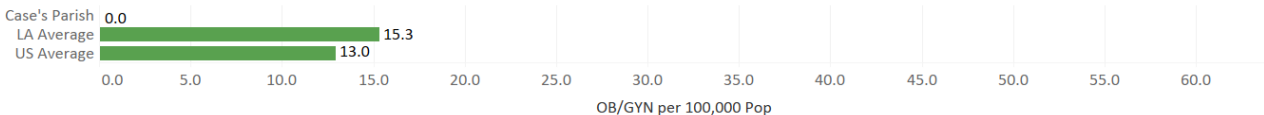
Geospatial Social Determinants of Health Data

A total of ten indicators are analyzed based on the decedent's residence at the time of death. The tool displays data on the decedent's parish or census tract of residence, the Louisiana average, and the US average.
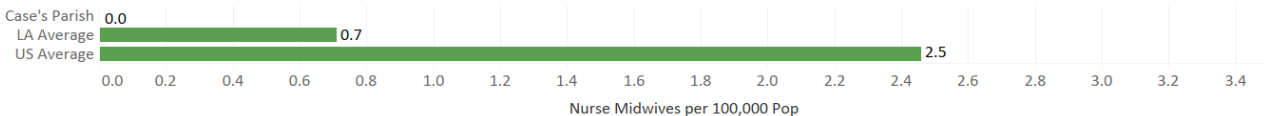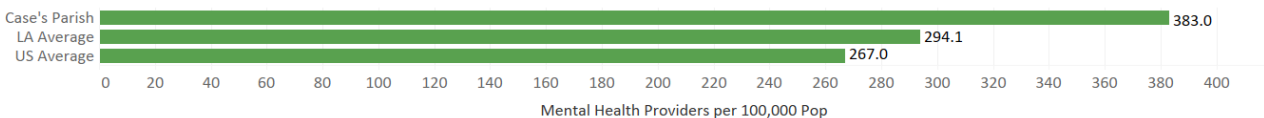
Physicians per capita

Case's Parish	47.1
LA Average	300.8
US Average	311.8

Physicians per 100,000 Pop

OB/GYN's per capita

Case's Parish	0.0
LA Average	15.3
US Average	13.0

OB/GYN per 100,000 Pop

Nurse Midwives per capita

Case's Parish	0.0
LA Average	0.7
US Average	2.5

Nurse Midwives per 100,000 Pop

Mental Health Practitioner per capita

Case's Parish	383.0
LA Average	294.1
US Average	267.0

Mental Health Providers per 100,000 Pop

Legend

🟩 Higher numbers are associated with better health outcomes
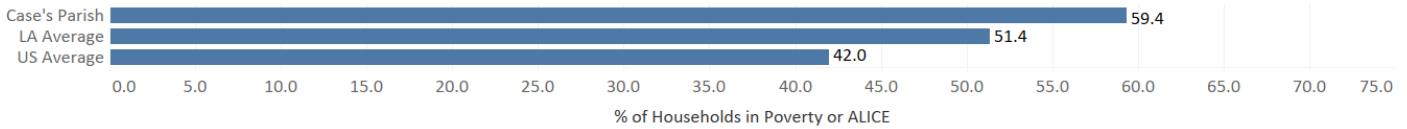
🟦 Higher numbers are associated with poor health outcomes

# D. Louisiana Bias or Racism and Social Determinants of Health (LABoRS) Tool

Percent of Households with No Vehicle (Census Tract)

Case's CT	5.4
LA Average	8.4
US Average	8.7

% of Households with No Vehicle

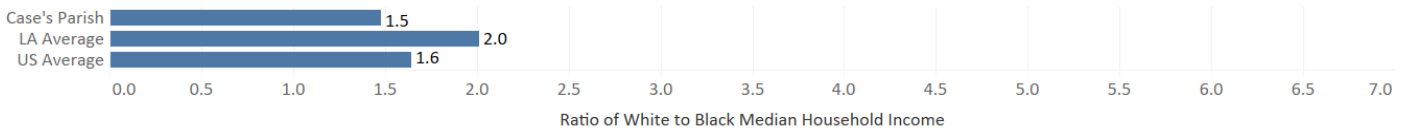## Percent of Households in Poverty or Asset Limited, Income Constrained and Employed (ALICE)

Case's Parish	59.4
LA Average	51.4
US Average	42.0

% of Households in Poverty or ALICE

Percent of Households spending >50% of Income on Housing Costs (Census Tract)

Case's CT	12.9
LA Average	13.6
US Average	14.4

% Housing Burden
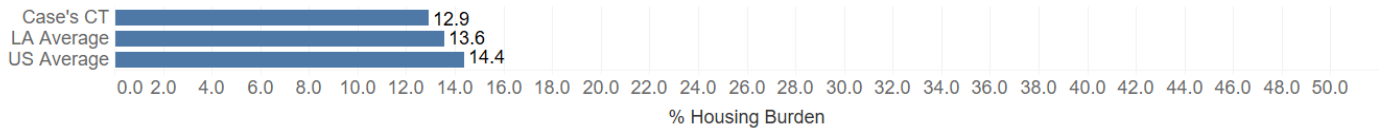
Structural Racism Indicators

Racial Inequality in Median Household Income

Case's Parish	1.5
LA Average	2.0
US Average	1.6

Ratio of White to Black Median Household Income

Racial Inequality in Educational Attainment

Case's Parish	1.0
LA Average	2.1
US Average	1.7

Ratio of White to Black Educational Attainment

Racial Inequality in Unemployment

Case's Parish	2.2
LA Average	2.6
US Average	2.3

Ratio of Black to White Unemployment

Legend
- ■ Higher numbers are associated with better health outcomes
- ■ Higher numbers are associated with poor health outcomes

Definitions of Geospatial Indicators used in LABoRS Tool

Indicator	Definition
Physicians per capita	Physicians per 100,000 population. Includes all M.D. and D.O. physicians with active status across specialties.
OB/GYN's per capita	OB/GYNs per 100,000 population. Includes all Obstetrics and Gynecology M.D. and D.O. physicians with active status.
Nurse Midwives per capita	Nurse midwives per 100,000 population. Includes Nurse Midwives with a National Provider Identifier (NPI) only.
Mental Health Practitioners per capita	Mental Health Practitioners per 100,000 population. Includes psychiatrists, psychologists, licensed clinical social workers, counselors, marriage and family therapists, and mental health providers that treat alcohol and other drug abuse, as well as advanced practice nurses specializing in mental health care.
Percent of Households with No Vehicle	Percent of households without a vehicle, based on data from the American Community Survey and the United States Census.
Percent of Households in Poverty or Asset Limited, Income Constrained and Employed (ALICE)	Percent of households who a) live below the Federal Poverty Level or b) live above the Federal Poverty Level but below the basic cost of living in their area.
Percent of Households spending >50% of Income on Housing Costs	Percent of households spending >50% of household income on housing costs, based on data from the American Community Survey and the United States Census.
Racial Inequality in Median Household Income	Ratio of white to black median household income. A higher number reflects greater racial inequality in household income.
Racial Inequality in Educational Attainment	Ratio of white to black educational attainment. A higher number reflects greater racial inequality in educational attainment.
Racial Inequality in Unemployment	Ratio of black to white unemployment. A Higher number reflects greater racial inequality in unemployment.

Case Record Findings on Potential Bias, Discrimination or Barriers to Care **(Includes all medical records and reports received by our MCH Coordinators for case review)**	
1. Negative patient/provider/facility interaction	Examples: Stigmatizing language, dismissing concerns, non-clinical patient-initiated transfers of care, case notes suggesting provider/facility conflict, blaming, casting doubt, etc.
2. Excessive gatekeeping	Examples: Inability to reach provider, lack of or delay in notification to provider, unanswered messages, leaving messages, etc.
3. Diagnostic delays that appear to be inconsistent with best practice	Examples: Delay in ordering or not ordering imaging/labs, delay in consults or case management assessment, delay in transfer of care, etc.
4. Leaving against medical advice	
5. Repeated ED visits in a short time frame	For urgent care concerns
6. Cultural incompetence	Examples: Lack of translator, lack of awareness of other cultures, etc.
7. Lack of access to health care before, during and/or after pregnancy	
8. Treatment decisions and recommendations that appear to be inconsistent with best practices	Examples: Over-treatment, under-treatment, delay in treatment, inadequate pain management, provider assumptions about patient's adherence to treatment, etc.
9. Other	

E. The Utah Tool

Criteria for Accidental Drug-Related Deaths	Case Examples
1. Pregnancy Complication	
a. Increased pain directly attributable to pregnancy or postpartum events leading to self harm or drug use that is implicated in suicide or accidental death	Back pain, pelvic pain, kidney stones, cesarean incision, or perineal tear
b. Traumatic event in pregnancy or postpartum with a temporal relationship between the event leading to self-harm or increased drug use and subsequent death	Stillbirth, preterm delivery, diagnosis of fetal anomaly, traumatic delivery experience, relationship destabilization due to pregnancy, removal of child(ren) from custody
c. Pregnancy-related complication likely exacerbated by drug use leading to subsequent death	Placental abruption or preeclampsia in setting of drug use
2. Chain of Events Initiated by Pregnancy	
a. Cessation or attempted taper of medications for pregnancy-related concerns (neonatal or fetal risk or fear of Child Protective Services involvement) leading to maternal destabilization or drug use and subsequent death	Substance use pharmacotherapy (methadone or buprenorphine), psychiatric medications, pain medications
b. Inability to access inpatient or outpatient drug or mental health treatment during pregnancy	Health care professionals uncomfortable with treating pregnant women, facilities that accept pregnant women unavailable
c. Perinatal depression, anxiety, or psychosis resulting in maternal destabilization or drug use and subsequent death	Depression diagnosed in pregnancy or postpartum resulting in suicide
d. Recovery or stabilization of substance use disorder achieved during pregnancy or postpartum with clear statement in records that pregnancy was motivating factor with subsequent relapse and subsequent death	Relapse leading to overdose due to decreased tolerance or polysubstance use
3. Aggravation of underlying condition by pregnancy	
a. Worsening of underlying depression, anxiety, or other psychiatric condition in pregnancy or the postpartum period with documentation that mental illness led to drug use or self-harm and subsequent death	Pre-existing depression exacerbated in the postpartum period leading to suicide
b. Exacerbation, under-treatment, or delayed treatment of pre-existing condition in pregnancy or postpartum leading to use of prescribed or illicit drugs resulting in death or suicide	Under-treatment of chronic pain leading to misuse of medications or use of illicit drugs, resulting in death
c. Medical conditions secondary to drug use in setting of pregnancy or postpartum that may be attributable to pregnancy-related physiology and increased risk of complications leading to death	Stroke or cardiovascular event due to stimulant use

F. Acronyms

Acronym	Definition
AAFP	American Academy of Family Physicians
ACEs	Adverse Childhood Experiences
ACOG	American College of Obstetricians and Gynecologists
AIM	Alliance for Innovation on Maternal Health
AMA	American Medical Association
ASAM	American Society of Addiction Medicine
BFH	Bureau of Family Health
CDC	Center for Disease Control and Prevention
CPDS	Caregiver Perinatal Depression Screening
ED	Emergency Department
ERASE MM	Enhancing Reviews and Surveillance to Eliminate Maternal Mortality
DAFR	Domestic Abuse Fatality Review
ICSED	Improved Care for the Substance Exposed Dyad
IPV	Intimate Partner Violence
LABoRS	Louisiana Bias or Racism and Social Determinants of Health
LA MIECHV	Louisiana Maternal, Infant and Early Childhood Home Visiting
LAMHPP	Louisiana Mental Health Perinatal Partnership
LaPQC	Louisiana Perinatal Quality Collaborative
LDH	Louisiana Department of Health
LSBME	Louisiana State Board of Medical Examiners
MAT	Medication Assisted Therapy
MCH	Maternal and Child Health
MMRC	Maternal Mortality Review Committee
MMRIA	Maternal Mortality Review Information Application
MVC	Motor Vehicle Collision

F. Acronyms

Acronym	Definition
NFP	Nurse Family Partnership
OPH	Office of Public Health
PAMR	Pregnancy-Associated Mortality Review
PAT	Parents as Teachers
PMAD	Perinatal or Postpartum Mood and Anxiety Disorder
PMSS	Pregnancy Mortality Surveillance System
PRAMS	Pregnancy Risk Assessment Monitoring System
RHP	Reproductive Health Program
SBI	Safe Births Initiative
SDoH	Social Determinants of Health
SUD	Substance Use Disorder
TBI	Traumatic Brain Injury
VTE	Venous Thromboembolism

F. Pregnancy Mortality Surveillance System (PMSS) Cause of Death Categorizations

PMSS Cause of Death	Explanation / Included Conditions
Hypertensive Disorders of Pregnancy	Preeclampsia, Eclampsia, Chronic hypertension with superimposed preeclampsia
Gastrointestinal Disorders	Crohn's disease/Ulcerative colitis, Liver disease/failure/transplant, Other gastrointestinal diseases/Not otherwise specified
Infection	Postpartum genital tract (e.g., of the uterus/pelvis/perineum/ necrotizing fasciitis), Sepsis/septic shock, Chorioamnionitis/ Antepartum infection, Urinary tract infection, Influenza, COVID-19, Pneumonia, Other non-pelvic infection (e.g., tuberculosis, meningitis, HIV), Other infection/Not otherwise specified
Injury	Intentional (homicide), Unintentional, Unknown intent/Not otherwise specified
Mental Health Conditions	Depressive disorder, Anxiety disorder (including post-traumatic stress disorder), Bipolar disorder, Psychotic disorder, Substance use disorder, Other psychiatric conditions/Not otherwise specified
Metabolic/Endocrine	Diabetes mellitus, Other metabolic/endocrine disorders/Not otherwise specified
Neurologic/Neurovascular Conditions (excluding cerebrovascular accidents)	Epilepsy/seizure disorder, Other neurologic diseases/Not otherwise specified
Pulmonary Conditions (Excludes Adult Respiratory Distress Syndrome)	Chronic lung disease, Cystic fibrosis, Asthma, Other pulmonary disease/Not otherwise specified
Renal Diseases	Chronic renal failure/End-stage renal disease, Other renal disease/Not otherwise specified
Unknown Cause of Death	----

PMSS Cause of Death Categorizations available at: reviewtoaction.org/sites/default/files/national-portal-material/Report%20from%20Nine%20MMRCs%20final%20edit.pdf

References

1. Amnesty International Publications. (2010). Deadly delivery: the maternal healthcare crisis in the USA. Retrieved from Amnesty International Website: https://www.amnesty.org/en/documents/amr51/019/2010/en/
2. Hunt, P., & Bueno de Mesquita., J. (2010). Reducing maternal mortality –the contribution of the right to the highest attainable standard of health. Retrieved from https://www.unfpa.org/sites/default/files/pub-pdf/reducing_mm.pdf
3. Tikkanen R, Gunja M, FitzGerald M, & Zephyrin L (2020). Maternal Mortality and Maternity Care in the United States Compared to 10 Other Developed Countries. Retrieved from https://www.commonwealthfund.org/publications/issue-briefs/2020/nov/maternal-mortality-maternity-care-us-compared-10-countries
4. Building U.S. Capacity to Review and Prevent Maternal Deaths. (2018). Report from nine maternal mortality review committees. Retrieved from http://reviewtoaction.org/Report_from_Nine_MMRCs
5. Review to Action. Retrieved from: http://reviewtoaction.org/learn/definitions
6. Bruzelius E, Martins SS. US Trends in Drug Overdose Mortality Among Pregnant and Postpartum Persons, 2017-2020. JAMA. 2022;328(21):2159–2161. doi:10.1001/jama.2022.17045
7. Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion (2023, March 23). Pregnancy Mortality Surveillance System. Retrieved from https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm?CDC_AA_refVal=https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregnancy-mortality-surveillance-system.htm
8. Hoyert DL. Maternal mortality rates in the United States, 2020. NCHS Health E-Stats. 2022. DOI: https://dx.doi.org/10.15620/cdc:113967
9. Osterman MJK, Hamilton BE, Martin JA, Driscoll AK, Valenzuela CP. Births: Final data for 2020. National Vital Statistics Reports; vol 70 no 17. Hyattsville, MD: National Center for Health Statistics. 2022. DOI: https://dx.doi.org/10.15620/cdc:112078.
10. Gillispie-Bell V. (2021). The Contrast of Color: Why the Black Community Continues to Suffer Health Disparities. Obstetrics and gynecology, 137(2), 220–224. https://doi.org/10.1097/AOG.0000000000004226.
11. Prather, C., Fuller, T. R., Marshall, K. J., & Jeffries, W. L., 4th (2016). The Impact of Racism on the Sexual and Reproductive Health of African American Women. Journal of women's health (2002), 25(7), 664–671. https://doi.org/10.1089/jwh.2015.5637.
12. Hoffman, K. M., Trawalter, S., Axt, J. R., & Oliver, M. N. (2016). Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. Proceedings of the National Academy of Sciences of the United States of America, 113(16), 4296–4301. https://doi.org/10.1073/pnas.1516047113
13. Saluja, B., & Bryant, Z. (2021). How Implicit Bias Contributes to Racial Disparities in Maternal Morbidity and Mortality in the United States. Journal of women's health (2002), 30(2), 270–273. https://doi.org/10.1089/jwh.2020.8874
14. Ashley W. (2014). The angry black woman: the impact of pejorative stereotypes on psychotherapy with black women. Social work in public health, 29(1), 27–34. https://doi.org/10.1080/19371918.2011.619449
15. Crear-Perry, J., Correa-de-Araujo, R., Lewis Johnson, T., McLemore, M. R., Neilson, E., & Wallace, M. (2021). Social and Structural Determinants of Health Inequities in Maternal Health. Journal of women's health (2002), 30(2), 230–235. https://doi.org/10.1089/jwh.2020.8882
16. Wang, E., Glazer, K. B., Howell, E. A., & Janevic, T. M. (2020). Social determinants of pregnancy-related mortality and morbidity in the United States: A systematic review. Obstetrics & Gynecology, 135(4), 896-915. https://pubmed.ncbi.nlm.nih.gov/32168209/
17. Alvarez, K. S., Bhavan, K., Mathew, S., Johnson, C., McCarthy, A., Garcia, B., Callies, M., Stovall, K., Harms, M., & Kho, K. A. (2022). Addressing childcare as a barrier to healthcare access through community partnerships in a large public health system. BMJ open quality, 11(4), e001964. https://doi.org/10.1136/bmjoq-2022-001964

References

18. Silva, Lindsay Ma,b; Coolman, Mariannea,c; Steegers, Eric APc; Jaddoe, Vincent WVa,d,e; Moll, Henriëtte Ae; Hofman, Albertd; Mackenbach, Johan Pb; Raat, Heinb. Low socioeconomic status is a risk factor for preeclampsia: the Generation R Study. Journal of Hypertension 26(6):p 1200-1208, June 2008. | DOI: 10.1097/HJH.0b013e3282fcc36e

19. Importance of social determinants of health and cultural awareness in the delivery of reproductive health care. ACOG Committee Opinion No. 729. American College of Obstetricians and Gynecologists. Obstet Gynecol 2018;131:e43–8.

20. COUNCIL ON COMMUNITY PEDIATRICS (2016). Poverty and Child Health in the United States. Pediatrics, 137(4), e20160339. https://doi.org/10.1542/peds.2016-0339

21. Mann C, Striar A. (2022). How Differences in Medicaid, Medicare, and Commercial Health Insurance Payment Rates Impact Access, Health Equity, and Cost. The Commonwealth Fund. Retrieved August 11, 2023. https://www.commonwealthfund.org/blog/2022/how-differences-medicaid-medicare-and-commercial-health-insurance-payment-rates-impact

22. Opioid use and opioid use disorder in pregnancy. Committee Opinion No. 711. American College of Obstetricians and Gynecologists. Obstet Gynecol 2017;130:e81–94.

23. Intimate partner violence. Committee Opinion No. 518. American College of Obstetricians and Gynecologists. Obstet Gynecol 2012; 119:412–7.

24. Johnson, Sara MD; Kasparian, Nadine A. PhD; Cullum, Arlene S. MPH; Flanagan, Tracy MD; Ponting, Carolyn PhD; Kowalewski, Leslie BS; Main, Elliott K. MD. Addressing Adverse Childhood and Adult Experiences During Prenatal Care. Obstetrics & Gynecology 141(6):p 1072-1087, June 2023. | DOI: 10.1097/AOG.0000000000005199

25. Patient-and Family-Centered Care. Institute for Patient-and Family-Centered Care. https://www.ipfcc.org/about/pfcc.html. Retrieved June 21, 2023.

26. Attanasio, L. B., Ranchoff, B. L., Cooper, M. I., & Geissler, K. H. (2022). Postpartum Visit Attendance in the United States: A Systematic Review. Women's health issues : official publication of the Jacobs Institute of Women's Health, 32(4), 369–375. https://doi.org/10.1016/j.whi.2022.02.002

27. Opinion 1.1.4 Patient Responsibilities. American Medical Association Code of Medical Ethics. Retrieved August 11, 2023. https://code-medical-ethics.ama-assn.org/ethics-opinions/patient-responsibilities.

28. Care Coordination. Content last reviewed August 2018. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/ncepcr/care/coordination.html. Retrieved June 19, 2023.

29. Substance Abuse and Mental Health Services Administration, Drug Abuse Warning Network, 2011: National Estimates of Drug-Related Emergency Department Visits. HHS Publication No. (SMA) 13-4760, DAWN Series D-39. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2013.

30. 30. Anderson ES, Rusoja E, Luftig J, Friedman A, Hailozian C, Herring AA. Annals of Emerg Med. 2023 Mar;81(3):297-308. doi: 10.1016/j.annemergmed.2022.09.025.

31. 31. Clapp, M. A., James, K. E., & Kaimal, A. J. (2018). The effect of hospital acuity on severe maternal morbidity in highrisk patients. American journal of obstetrics and gynecology, 219(1), 111.e1–111.e7. https://doi.org/10.1016/j.ajog.2018.04.015

32. 32. Optimizing postpartum care. ACOG Committee Opinion No. 736. American College of Obstetricians and Gynecologists. Obstet Gynecol 2018;131:e140–50.

33. 33. Treatment and management of mental health conditions during pregnancy and postpartum. Clinical Practice Guideline No. 5. American College of Obstetricians and Gynecologists. Obstet Gynecol 2023;141:1262–88.

34. 34. Tracy, K., & Wallace, S. P. (2016). Benefits of peer support groups in the treatment of addiction. Substance abuse and rehabilitation, 7, 143–154. https://doi.org/10.2147/SAR.S81535

35. 35.Harm reduction: An approach to reducing risky health behaviours in adolescents. Paediatr Child Health. 2008 Jan;13(1):53-60. doi: 10.1093/pch/13.1.53. PMID: 19119355; PMCID: PMC2528824.

References

36. Gunn, A. H., Smothers, Z. P. W., Schramm-Sapyta, N., Freiermuth, C. E., MacEachern, M., & Muzyk, A. J. (2018). The Emergency Department as an Opportunity for Naloxone Distribution. The western journal of emergency medicine, 19(6), 1036–1042. https://doi.org/10.5811/westjem.2018.8.38829

37. Logan DE, Marlatt GA. Harm reduction therapy: a practice-friendly review of research. J Clin Psychol. 2010 Feb;66(2):201-14. doi: 10.1002/jclp.20669. PMID: 20049923; PMCID: PMC3928290.

38. Stewart, T. (2023, April). Overview of motor vehicle traffic crashes in 2021 (Report No. DOT HS 813 435). National Highway Traffic Safety Administration

39. Forray, A., Merry, B., Lin, H., Ruger, J. P., & Yonkers, K. A. (2015). Perinatal substance use: a prospective evaluation of abstinence and relapse. Drug and alcohol dependence, 150, 147–155. https://doi.org/10.1016/j.drugalcdep.2015.02.027

40. National Center for Statistics and Analysis. (2022, January). Seat belt use in 2021 – Overall results (Traffic Safety Facts Research Note. Report No. DOT HS 813 407). Washington, DC: NHTSA.

41. Substance Abuse Center for Behavioral Health Statistics and Quality. Results from the 2021 National Survey on Drug Use and Health: detailed Tables, SAMHSA. Accessed January 2023.

42. White House Blueprint for Addressing the Maternal Health Crisis. The White House. Washington, DC. Published June 2022. https://www.whitehouse.gov/wp-content/uploads/2022/06/Maternal-Health-Blueprint.pdf. Retrieved June 19, 2023.

43. Connor, L., Dean, J., McNett, M., Tydings, D. M., Shrout, A., Gorsuch, P. F., Hole, A., Moore, L., Brown, R., Melnyk, B. M., & Gallagher-Ford, L. (2023). Evidence-based practice improves patient outcomes and healthcare system return on investment: Findings from a scoping review. Worldviews on Evidence-Based Nursing, 20, 6– 15. https://doi.org/10.1111/wvn.12621

44. Opioid use and opioid use disorder in pregnancy. Committee Opinion No. 711. American College of Obstetricians and Gynecologists. Obstet Gynecol 2017;130:e81–94.

45. Patient Safety Bundles. Alliance for Innovation on Maternal Health. Patient Safety Bundles For Safer Birth | AIM. Retrieved June 21, 2023.

46. Statement of Policy: Opposition to Criminalization of Individuals During Pregnancy and the Postpartum Period. American College of Obstetricians and Gynecologists. Published December 2020. Retrieved August 11, 2023. https://www.acog.org/clinical-information/policy-and-position-statements/statements-of-policy/2020/opposition-criminalization-of-individuals-pregnancy-and-postpartum-period.

47. Zwick, J., Appleseth, H., & Arndt, S. (2020). Stigma: how it affects the substance use disorder patient. Substance abuse treatment, prevention, and policy, 15(1), 50. https://doi.org/10.1186/s13011-020-00288-0