Alabama Department of Public Health Bureau of Family Health Services

Alabama Maternal Mortality Review Report For 2018 - 2019

ALABAMA PUBLIC HEALTH

ALABAMA MMR

MATERNAL MORTALITY REVIEW

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Acknowledgements

The Alabama Department of Public Health (ADPH), Bureau of Family Health Services (BFHS), and the Alabama Maternal Mortality Review Committee (AL-MMRC) would like to acknowledge the Alabama women who lost their lives in 2018 and 2019 while pregnant or within a year of pregnancy. We extend our condolences to the children and families of these women. It is our hope that these findings will allow us to better understand the events leading up to these deaths and prevent other women and their families from suffering the same outcome.

We extend our gratitude to our sponsors and supporters at the March of Dimes and the American College of Obstetricians and Gynecologists-Alabama Chapter.

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Introduction

The AL-MMRC was established in 2018 under the leadership of ADPH and the Bureau of Family Health Services (BFHS). The committee is composed of experts and stakeholders who are familiar with the unique aspects of maternal health in Alabama, as well as the resources available to the state.

According to the Centers for Disease Control and Prevention (CDC) Maternal Mortality Review Committee Decisions Form, Alabama defines a "pregnancy-related death" as a death that occurs during pregnancy or within 1 year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition from the physiological effects of pregnancy. A "pregnancy-associated death" is a death that occurs during pregnancy or within 1 year of the end of pregnancy from a cause that is not related to pregnancy. A death is considered preventable if the AL-MMRC determines that there was at least some chance of the death being averted by one or more reasonable changes to patient/family, community, provider, facility, and/or systems factors.

Cases for possible review are first identified in women ages 15-56 years old who died between 2018 and 2019. Pregnancy is confirmed using the death certificate indication of pregnancy at or within 1 year of death and/or a matching birth or fetal death certificate within 1 year of death. The decedent also has to be an Alabama resident at the time of death. Each death certificate is also evaluated for possible errors.

In the previous years of reviews (deaths from 2016-2017), the committee excluded deaths that occurred due to homicide or motor vehicle accidents. The committee began including those deaths in the 2018 reviews.

After the deaths are deemed eligible for review by the AL-MMRC, any pertinent records relating to the pregnancy and maternal death are abstracted. These records may include prenatal records, hospital and emergency room records, coroner and autopsy reports, law enforcement reports, news reports, and obituaries. Maternal Mortality Review Program Staff then create de-identified case summaries for the committee's review.

The AL-MMRC utilized the CDC Maternal Mortality Review Committee Decision Form to answer the following questions during the review process:

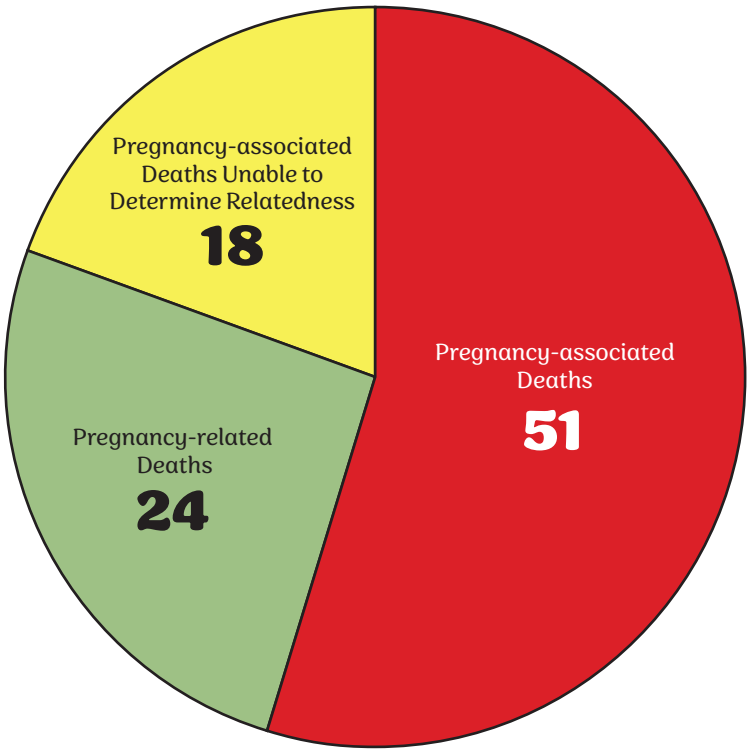
1. Was the death pregnancy-related?
2. What was the underlying cause of death?
3. Was the death potentially preventable and what was the chance to alter the outcome?
4. What were the factors that contributed to the death?
5. What are the recommendations and actions that address the contributing factors?

AL-MMRC Key Findings for 2018-2019

After reviewing 93 maternal deaths between 2018 and 2019, the AL-MMRC determined whether the death was either pregnancy-related or pregnancy-associated. Additionally, the AL-MMRC made recommendations on how to prevent future maternal deaths within Alabama.

Pregnancy-related deaths are deaths during pregnancy or within 1 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 deaths are deaths that occur during pregnancy or within 1 year of the end of pregnancy from a cause that was not related to pregnancy.



Leading Causes of Pregnancy-related Deaths (n=24)

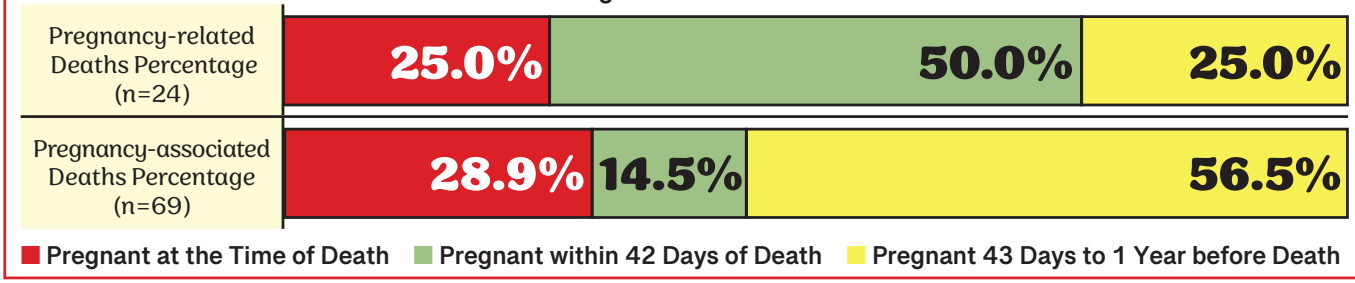
1. Infection
2. Cardiovascular
3. Hemorrhage (Excluding Aneurysms)

Leading Causes of Pregnancy-associated Deaths (n=69)

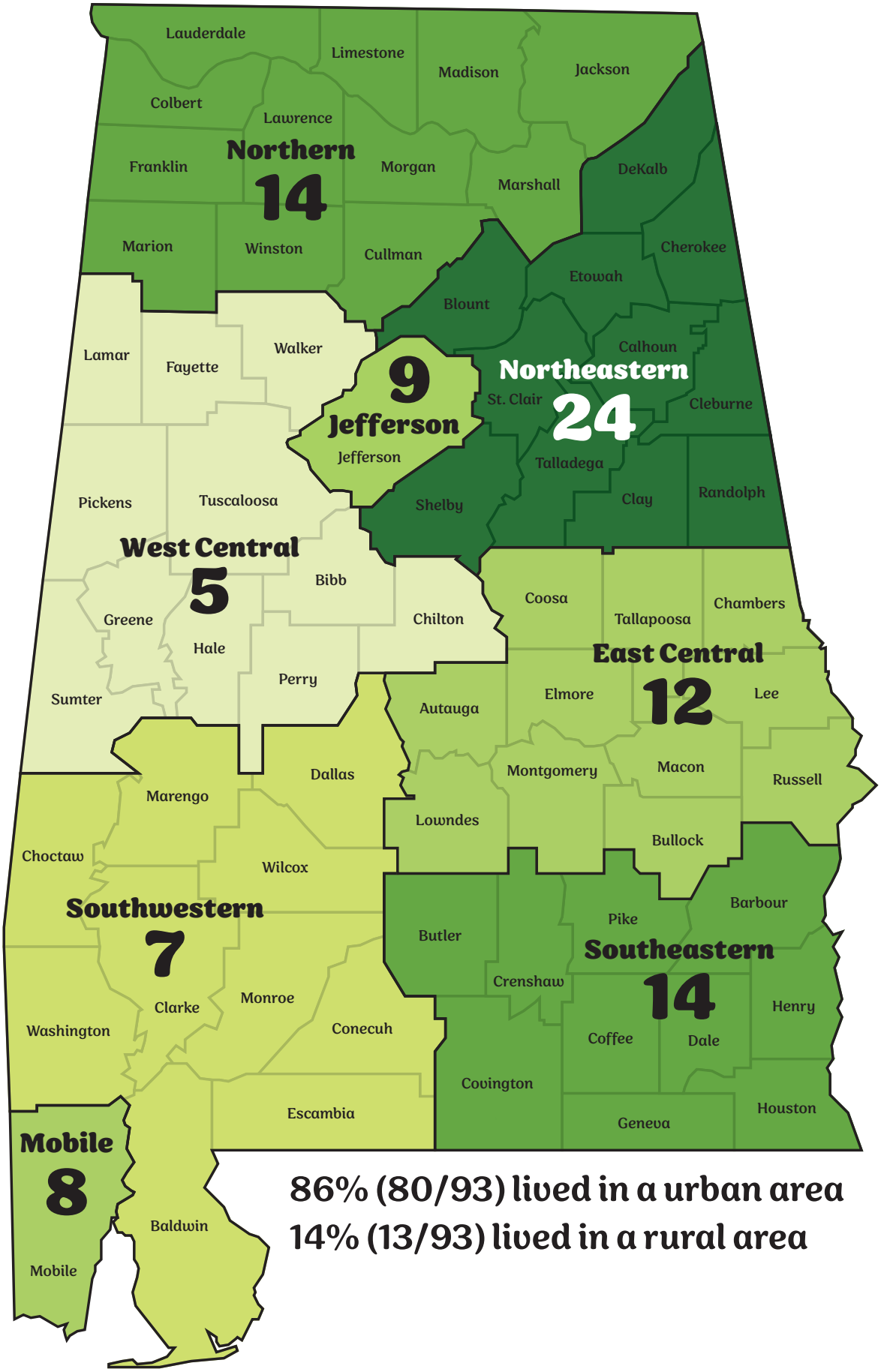
1. Motor Vehicle Accidents
2. All Other*
3. Overdose

*Includes intracranial hemorrhage, acute liver failure, acute respiratory failure, anoxic brain injury, and pulmonary embolism

Timing of Death Overview

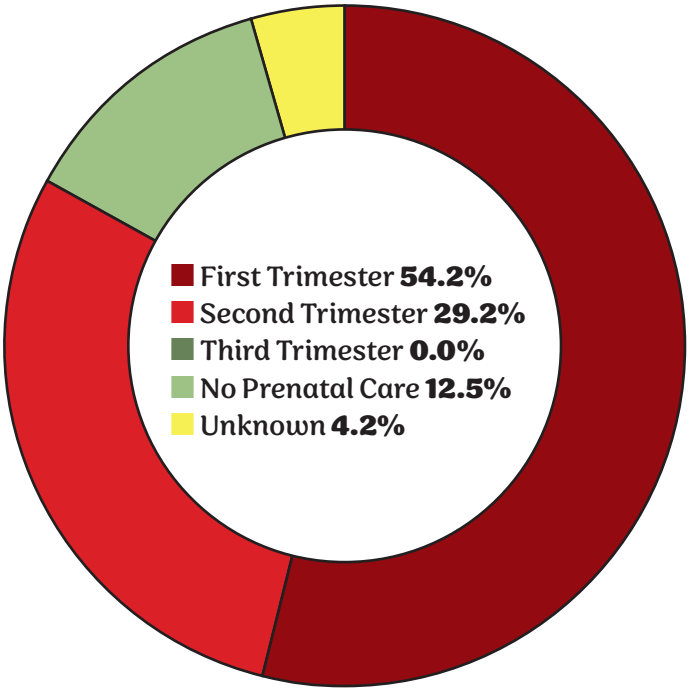


Total Number of Deaths by Public Health District

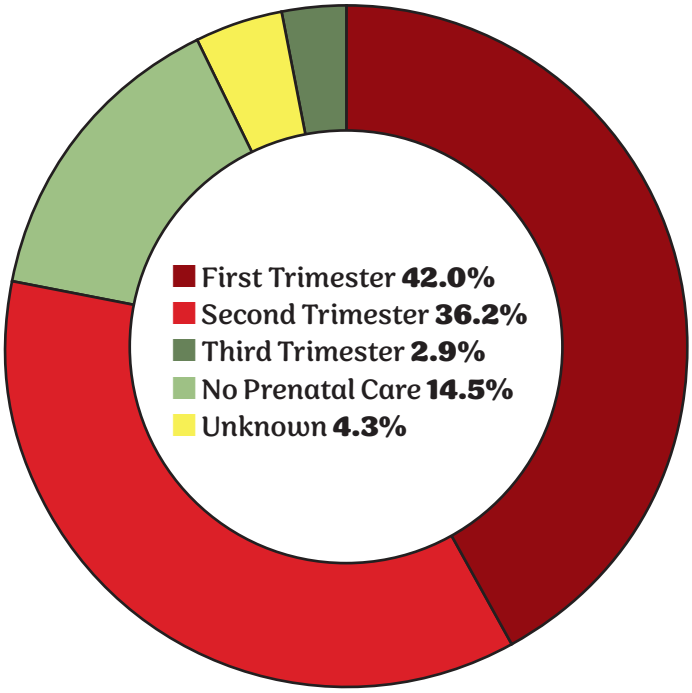


86% (80/93) lived in a urban area
14% (13/93) lived in a rural area

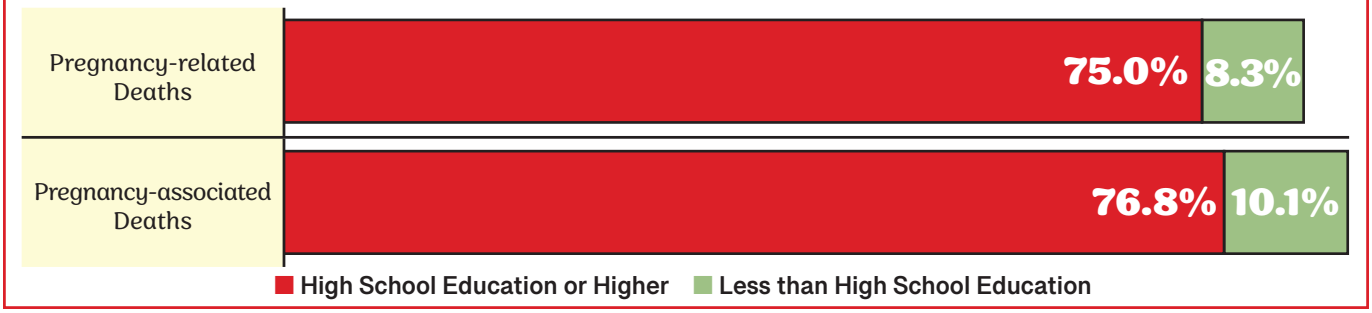
Pregnancy-related Deaths (n=24) Percentage Overview, Trimester of First Prenatal Visit



Pregnancy-associated Deaths (n=69) Percentage Overview, Trimester of First Prenatal Visit

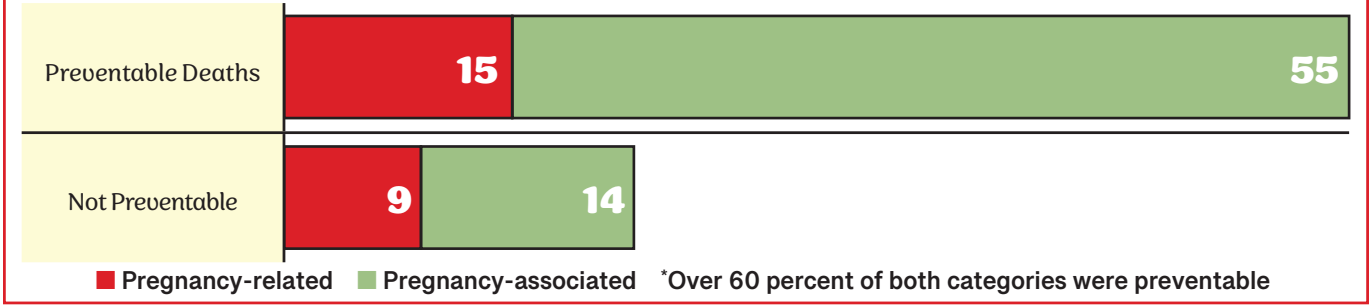


Education Level



Medicaid Insurance at Time of Delivery

Preventability as Determined by the AL-MMRC*

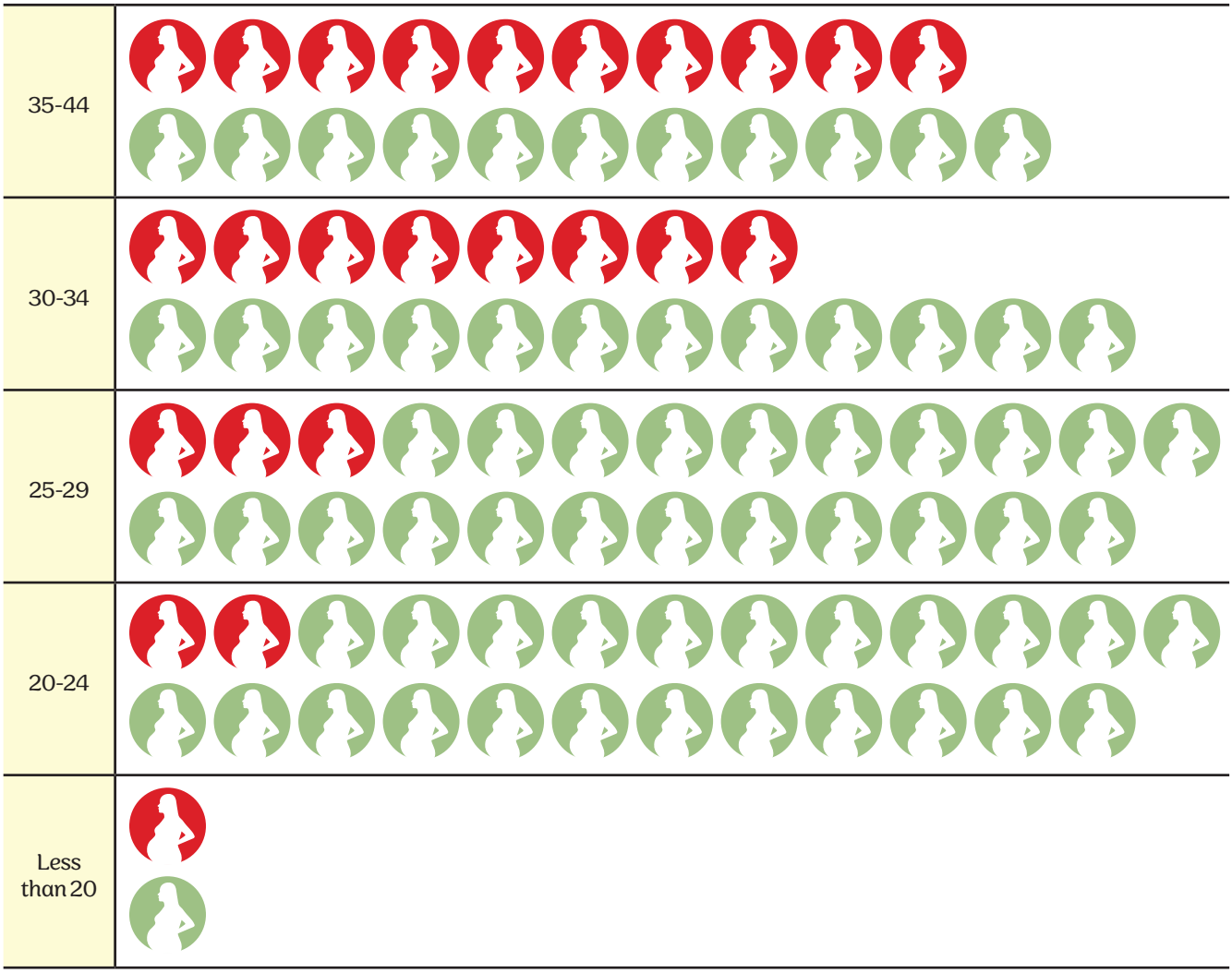


*Over 60 percent of both categories were preventable

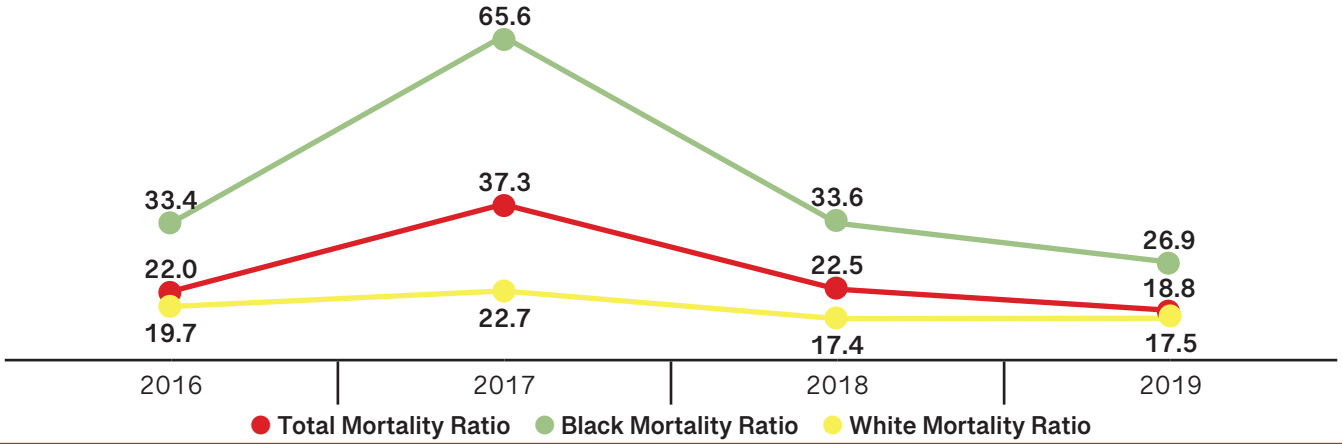
Pregnancy-related Deaths Preventability by Timing of Death (n=15)

Pregnant 43 Days to 1 Year before Death	Pregnant within 42 Days of Death	Pregnant at Time of Death
40.0%	33.3%	26.7%

Deaths by Age Group



Pregnancy-related Deaths Mortality Ratios (per 100,000 live Births), by Race and Year



Key Recommendations Based on MMRC Findings

Waive the waiting period for Medicaid recipients requesting a bilateral tubal ligation.	Increase access to mental health and substance use disorder services for pregnant and postpartum women in Alabama.
Eliminate the chemical endangerment law so that women will seek care when pregnant and promote voluntary treatment.	Increase and enhance care coordination and social services for women during preconception, interconception, and postpartum periods.
Continue development of a maternal leveling system between hospitals for obstetric patients.	Provide implicit bias training for all health care providers and staff.
Establish standardized protocols for assessing clinical signs of pregnancy among women of childbearing age at primary care offices and emergency departments.	Discourage routine narcotic prescriptions at hospital discharge to women who had an uncomplicated vaginal delivery or a history of substance use disorder.
Provide self-reported screening for pregnant women with substance use disorder and mental health conditions and refer them for treatment in a timely manner.	Provide comprehensive family planning and contraceptive counseling to all women of childbearing age with chronic health conditions.
Recognize and provide appropriate monitoring and referrals for patients at high risk for cardiovascular complications during pregnancy.	Educate women with high-risk conditions on the risks of becoming pregnant and the consequences of non-compliance at any point during care.
	Educate pregnant women on the importance of seat belts and safe driving.

Additional Topics Discussed in the Report

- Detailed tables of what was shown in the key findings
- Leading causes of death by racial breakdown
- Leading causes of death by age
- Contributing factors of pregnancy-related deaths and pregnancy-associated deaths
- Death preventability by timing
- Detailed recommendations made by AL-MMRC
- Looking into the future

Detailed Data Findings

Pregnancy-Related and Pregnancy-Associated Deaths Overview

Total Pregnancy-related and Pregnancy-associated Deaths as Determined by the AL-MMRC

Table 1 calculates the following ratios using the total number of live births reported by the Alabama Center for Health Statistics (AL-CHS).

Table 1: Pregnancy-related and associated Deaths Determined by the AL-MMRC by Year of Death, 2018-2019

	Pregnancy-related		Pregnancy-associated, Not Related		Pregnancy-associated, Unable to Determine Relatedness			
Year of Death	Count	Ratio[1]	Count	Ratio[1]	Count	Ratio[1]	Total	Births
2018	13	22.5	27	46.8	11	19.0	51	57,754
2019	11	18.8	24	40.9	7	11.9	42	58,615
Total	**24**	**20.6**	**51**	**43.8**	**18**	**15.5**	**93**	**116,369**

[1]Maternal mortality ratios calculated as deaths per 100,000 live births

AL-MMRC Maternal Racial Breakdown

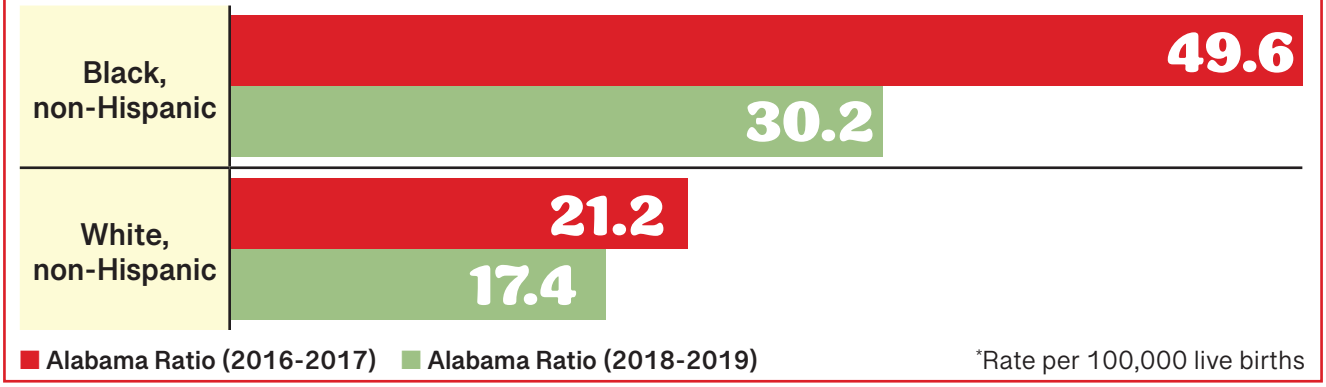
Table 2 calculated maternal mortality ratios by combining the deaths reported in 2018 and 2019. The maternal mortality ratio for non-Hispanic blacks was almost two times higher than non-Hispanic whites. In Figure 1, the 2018-2019 maternal mortality ratios for non-Hispanic blacks and non-Hispanic whites were lower than the 2016-2017 ratios.

Table 2: Pregnancy-related/-associated Deaths by Race/Ethnicity, 2018-2019

	Pregnancy-related		Pregnancy-associated, Not Related		Pregnancy-associated, Unable to Determine Relatedness			
Race	Count	Ratio[1]	Count	Ratio[1]	Count	Ratio[1]	Total	Births
Black, non-Hispanic	11	30.2	20	54.9	6	16.5	37	36,430
White, non-Hispanic	12	17.4	31	45.0	12	17.4	55	68,909
Other, non-Hispanic	1	38.4	0	0.0	0	0.0	1	2,604
Hispanic	0	0.0	0	0.0	0	0.0	0	8,374

[1]Maternal mortality ratios calculated as deaths per 100,000 live births

Figure 1: Pregnancy-related Mortality Ratio Comparison by Time Frame*



AL-MMRC Maternal Age Breakdown

As seen in Table 3, there was a higher number of pregnancy-related deaths that occurred among the age group 35-44. Pregnancy-associated deaths are the highest among the 20-24 year old age group. Looking at Table 4, the leading cause of death for pregnancy-associated cases was motor vehicle accidents. During this time frame, 24 pregnancy-associated deaths occurred as a result of a motor vehicle accident. Based on these findings, the AL-MMRC made safe driving recommendations.

Table 3: Pregnancy-related/-associated Deaths by Age, 2018-2019

	Pregnancy-related		Pregnancy-associated, Not Related		Pregnancy-associated, Unable to Determine Relatedness			
Age (in Years)	Count	Ratio[1]	Count	Ratio[1]	Count	Ratio[1]	Total	Births[2]
Less than 20	1	12.6	1	12.6	0	0.0	2	7,963
20-24	2	6.5	20	65.5	3	9.8	25	30,544
25-29	3	8.1	13	35.1	9	24.3	25	37,007
30-34	8	29.4	8	29.4	4	14.7	20	27,197
35-44	10	73.9	9	66.5	2	14.8	21	13,524

[1]Maternal mortality ratios calculated as deaths per 100,000 live births
[2]Of the total deliveries reported (N=116,369), there are 134 mothers between the ages of 45 or older or has a missing date of birth

Table 4: Leading Causes for Pregnancy-associated Deaths, 2018-2019

Cause of death	Total	Percentage	Ratio[1]
Motor vehicle accident	24	34.8%	20.6
All other*	11	15.9%	9.5
Overdose	10	14.5%	8.6
Malignant neoplasm	8	11.6%	6.9
Heart disease	7	10.1%	6.0
Homicide	4	5.8%	3.4
Suicide	2	2.9%	1.7
Undetermined	2	2.9%	1.7
Accident	1	1.4%	0.9
Total	**69**		**59.3**
2018-2019 Total Live Births	**116,369**		

[1]Maternal mortality ratios calculated as deaths per 100,000 live births
*Includes intracranial hemorrhage, acute liver failure, acute respiratory failure, anoxic brain injury, and pulmonary embolism

AL-MMRC Timing of Maternal Death and Timing of First Prenatal Visit

As seen in the Key Findings, the pregnancy-associated cases and pregnancy-associated, unable to determine relatedness cases were combined. Table 5 shows the percentage breakdown of these categories separated. Over half of the pregnancy-associated deaths occurred in the 43 days to 1 year time frame. Half of the pregnancy-related deaths occurred within 42 days. In Table 6, the majority of the women initiated prenatal care in the first trimester.

Table 5: Pregnancy-related/-associated Deaths by Pregnancy Status at Time of Death, 2018-2019

	Pregnancy-related		Pregnancy-associated, Not Related		Pregnancy-associated, Unable to Determine Relatedness		
Pregnancy Status	**Count**	**Percentage**	**Count**	**Percentage**	**Count**	**Percentage**	**Total**
Pregnant at the time of death	6	25.0%	15	29.4%	5	27.8%	26
Pregnant within 42 days of death	12	50.0%	5	9.8%	5	27.8%	22
Pregnant 43 days to 1 year before death	**6**	**25.0%**	**31**	**60.8%**	**8**	**44.4%**	**45**
Total	**24**		**51**		**18**		**93**

Table 6: Pregnancy-related/-associated Deaths by Start of Prenatal Care, 2018-2019

	Pregnancy-related		Pregnancy-associated, Not Related		Pregnancy-associated, Unable to Determine Relatedness		
Trimester of Prenatal Care Beginning	**Count**	**Percentage**	**Count**	**Percentage**	**Count**	**Percentage**	**Total**
First trimester	13	54.2%	20	39.2%	9	50.0%	42
Second trimester	7	29.2%	20	39.2%	5	27.8%	32
Third trimester	0	0.0%	2	3.9%	0	0.0%	2
No prenatal care	3	12.5%	7	13.8%	3	16.7%	13
Unknown	1	4.2%	2	3.9%	1	5.5%	4
Total	**24**		**51**		**18**		**93**

Medicaid Status at Time of Delivery

As seen in Table 7, over half of pregnancy-related deaths and pregnancy-associated deaths reported having Medicaid insurance. This remains true when separating the pregnancy-associated cases and the pregnancy-associated, unable to determine relatedness cases.

Table 7: Pregnancy-related/-associated Deaths by Medicaid Status at Time of Delivery, 2018-2019

	Pregnancy-related		Pregnancy-associated, Not Related		Pregnancy-associated, Unable to Determine Relatedness		
Medicaid Status	**Count**	**Percentage**	**Count**	**Percentage**	**Count**	**Percentage**	**Total**
Medicaid	14	58.3%	34	66.7%	11	61.1%	59
Non-Medicaid*	10	41.7%	17	33.3%	7	38.9%	34
Total	**24**		**51**		**18**		**93**

*Included self-pay, private and other (Tricare, other, and Indian Health Services)

Impact of Race and Age on Pregnancy-Related Cases

Table 8 shows the elevated risk of being pregnant at an older age group among both non-Hispanic blacks and non-Hispanic whites. In Table 9, infection was the top leading cause of death for those determined to be pregnancy-related. Eighty percent of the cases occurred between the 30-34 and 35-44 age groups. Table 10 shows that the non-Hispanic black maternal mortality ratio due to infection is almost four times higher than the non-Hispanic white ratio. In response to these numbers, the AL-MMRC has made recommendations to address infections.

Table 8: Pregnancy-related Deaths by Age and Race/Ethnicity, 2018-2019

	Black, non-Hispanic				White, non-Hispanic			
Age (in Years)	**Count**	**Percentage**	**Ratio[1]**	**Live Births**	**Count**	**Percentage**	**Ratio[1]**	**Live Births**
Less than 20	0	0.0%	0.0	3,195	1	8.3%	25.3	3,957
20-24	1	9.1%	9.0	11,159	1	8.3%	5.9	16,911
25-29	1	9.1%	8.8	11,426	2	16.7%	8.9	22,545
30-34	5	45.4%	72.2	6,930	3	25.0%	17.1	17,494
35-44	4	36.4%	108.3	3,692	5	41.7%	63.1	7,928
Total	**11**		**30.2**	**36,430**	**12**		**17.4**	**68,909**

[1]Maternal mortality ratios calculated as deaths per 100,000 live births

Table 9: Pregnancy-related Deaths by Age and Cause of Death, 2018-2019

Cause of death	Less than 20		20-24		25-29		30-34		35-44		Total
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	
Infection	0	0.0%	0	0.0%	1	33.3%	2	25.0%	2	20.0%	5
Cardiovascular conditions (excluding cardiomyopathy, HDP, and CVA)	0	0.0%	0	0.0%	0	0.0%	1	12.5%	2	20.0%	3
Hemorrhage (excluding aneurysms)	0	0.0%	1	50.0%	0	0.0%	1	12.5%	1	10.0%	3
Amniotic fluid embolism	0	0.0%	0	0.0%	0	0.0%	1	12.5%	1	10.0%	2
Embolism	0	0.0%	1	50.0%	0	0.0%	1	12.5%	0	0.0%	2
Unknown cause of death	0	0.0%	0	0.0%	0	0.0%	1	12.5%	1	10.0%	2
Cardiomyopathy	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	10.0%	1
Collagen vascular/ autoimmune diseases	0	0.0%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	1
Injury	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1
Mental health conditions	0	0.0%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	1
Metabolic/endocrine	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	10.0%	1
Pulmonary conditions (excluding ARDS)	0	0.0%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	1
Substance use	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	10.0%	1
Total	**1**		**2**		**3**		**8**		**10**		**24**

Table 10: Pregnancy-related Deaths by Race/Ethnicity and Cause of Death, 2018-2019

	Black, non-Hispanic			White, non-Hispanic		
Cause of Death	**Count**	**Percentage**	**Ratio[1]**	**Count**	**Percentage**	**Ratio[1]**
Infection	3	27.3%	8.2	2	16.7%	2.9
Cardiovascular conditions (excluding cardiomyopathy, HDP, and CVA)	1	9.1%	2.7	2	16.7%	2.9
Hemorrhage (excluding aneurysms)	2	18.2%	5.5	1	8.3%	1.5
Amniotic fluid embolism	0	0.0%	0	1	8.3%	1.5
Embolism	1	9.1%	2.7	1	8.3%	1.5
Unknown cause of death	1	9.1%	2.7	1	8.3%	1.5
Cardiomyopathy	0	0.0%	0	1	8.3%	1.5
Collagen vascular/autoimmune diseases	1	9.1%	2.7	0	0.0%	0
Injury	0	0.0%	0	1	8.3%	1.5
Mental health conditions	0	0.0%	0	1	8.3%	1.5
Metabolic/endocrine	1	9.1%	2.7	0	0.0%	0
Pulmonary conditions (excluding ARDS)	1	9.1%	2.7	0	0.0%	0
Substance use	0	0.0%	0	1	8.3%	1.5
Total	**11**		**30.2**	**12**		**17.4**

[1]Maternal mortality ratios calculated as deaths per 100,000 live births

Contributing Factors for Pregnancy-related and Pregnancy-associated Deaths

Based on the records provided, the AL-MMRC identified whether specific factors contributed to a maternal death. The contributing factors included obesity, mental health conditions, racism/discrimination, or substance use disorder. Deaths in which a circumstance likely contributed were defined as those in which the committee answered "yes" or "probably" for whether each circumstance had a contribution to the death. Figure 2 shows the breakdown of the contributing factors.

Starting in 2019, racism/discrimination was added as a new potential contributing factor to be determined by the AL-MMRC. There were no deaths observed that had racism or discrimination marked as a potential factor.

Table 11: Contributing Factors to Pregnancy-associated Deaths and Pregnancy-related Deaths

	Pregnancy-related Deaths (n=24)	Pregnancy-associated Deaths (n=69)
Obesity	33.3%	5.8%
Mental health conditions*	16.7%	23.2%
Substance use disorder	20.1%	29.0%

*Mental health conditions excluding substance use disorder

Alabama Pregnancy Risk Assessment Monitoring System (AL-PRAMS)

The AL-PRAMS monitors the experience of mothers before, during, and after delivery by sending surveys to randomly selected mothers throughout the state. The surveys provide a platform for women to express possible issues or outcomes that they have experienced throughout their pregnancy journey.

The 2018-2019 weighted data calculated by AL-PRAMS provided supporting evidence for the recommendations made by the AL-MMRC. Based on the AL-PRAMS responses, the weighted data will represent all Alabama deliveries. After the completion of the weighting process, the AL-PRAMS received a total of 1,609 completed surveys either by mail or phone. For both years, the overall state response rate was above 50 percent.

AL-MMRC Member Recommendations

Over the course of the 2018 and 2019 case reviews, more than 400 recommendations were made by the AL-MMRC. We have highlighted key recommendations.

Healthcare Coverage

The AL-MMRC record reviews have continued to show that complications leading to death can occur several months following pregnancy. Forty-five of the 93 deaths occurred among women who were pregnant between 43 days and a year before death. Fifty-nine of the 93 deaths reviewed were identified as women who receive coverage through the state's Medicaid program at delivery.

- The recommendation made by the AL-MMRC was to extend and expand Medicaid coverage for Alabama's women to increase access to health coverage resulting in greater positive health outcomes.
- Effective October 1, 2022, Alabama Medicaid extended postpartum coverage to 1 year after delivery.

Autopsies for Maternal Deaths

Only 39 of the 93 deaths reviewed had an autopsy performed. Having an autopsy performed, or at minimum a toxicology report, on all maternal deaths will help us determine and better understand the causes of and contributors to maternal mortality.

- The AL-MMRC recommended increasing the number of maternal autopsies to gain more insight into the cause of death.
- Funding from the Alabama Legislature has been allocated to the Alabama Department of Public Health Maternal Mortality Review Program to perform maternal autopsies at no charge to families.
- The Maternal Autopsy Program (MAP) will be piloted in Jefferson, Walker, Shelby, Mobile, and Baldwin Counties starting in October 2023.
- The autopsies will be performed at The University of Alabama at Birmingham (UAB) and The University of South Alabama (USA).

Access to Care

Barriers to accessing care, including transportation, primary care, and community support continue to impact maternal health in Alabama. Lack of healthcare can lead to chronic conditions, such as hypertension and diabetes.

The AL-PRAMS data addresses self-reported existing chronic health conditions of the women. Three months prior to getting pregnant, 3.0 percent of Alabama deliveries self-reported having diabetes and 7.6 percent of Alabama deliveries self-reported having hypertension. During their most recent pregnancy, 7.5 percent self-reported having diabetes and 17.9 percent self-reported having hypertension.

- Enhanced state funded assistance for transportation to medical therapy should be arranged, funded, and implemented, especially the availability of transportation services in rural areas.
- Increased access to primary care during the preconception, interconception, and postpartum periods is essential to decreasing the risk of death.
- Women, especially those with chronic conditions, should be encouraged to seek prenatal care early and maintain follow-up visits during and after pregnancy, as advised.
- Expansion of current maternal support systems in the community such as access to home visiting postpartum care/support programs, would help improve optimal outcomes.
- Development of maternal levels of care should be adopted as they are critical to reducing maternal mortality and assuring that women receive the appropriate care.
- Increased funding for rural emergency medical services is needed to improve response times.

Patient/Family Education

Maternal health education during the preconception, interconception, and postpartum period is imperative to reducing maternal mortality. Of the 93 deaths reviewed, 65 of them had pre-existing conditions such as hypertension, diabetes, asthma, heart disease, and lupus. Eight of the 24 pregnancy-related deaths listed obesity as a contributing factor. At least 40 of the 93 deaths reviewed, smoked cigarettes at some point before or during pregnancy. Motor vehicle accidents accounted for 34.8 percent of the pregnancy-associated deaths.

According to the AL-PRAMS data, throughout any health care visit in the 12 months leading up to their pregnancy, mothers were asked if medical staff discussed the following health topics with them: medication adherence, not wanting children, birth control methods, and ensuring a safe delivery occurred. During any medical visit that occurred 12 months before pregnancy, 43.5 percent reported that medical staff talked to them about their desire to either have or not have children. Fifty-two percent stated that medical staff did not discuss birth control methods at any health care visit that occurred twelve months before getting pregnant. For birth control methods use, 9.5 percent were not asked during any prenatal visit if they were planning to use birth control after the baby was born. Of those who self-reported smoking within the past 2 years, 92 percent self-reported smoking during the first 3 months of pregnancy and 44 percent self-reported smoking during the last 3 months of pregnancy. Looking at the topics discussed at any prenatal visit, 24.9 percent stated that medical staff did not talk about how smoking during pregnancy could affect the baby, 6.9 percent stated that medical staff did not ask them if they were smoking cigarettes, and 8.4 percent stated that medical staff did not ask them if they were drinking alcohol.

AL-PRAMS included questions on whether health topics or resources were discussed at the postpartum visit. Health topics at that time included the following: 48.1 percent did not discuss the importance of birth spacing, 39.2 percent were not asked about their smoking history, and 10.8 percent did not discuss birth control methods that can be used after delivery. For resources and procedures completed postpartum, 52.5 percent were prescribed contraceptives and 18.5 percent received a contraceptive implant.

- Women should be provided preconception counseling and education about the risks that obesity can contribute to pregnancy outcomes and be provided opportunities for support including nutrition counseling and increased access to adequate nutrition.
- The population of women who have high risk conditions needs to be educated on and have an understanding of the risks of becoming pregnant and the potential consequences of noncompliance at any point during care if they do become pregnant.
- There should be an increased awareness of the need to seek treatment early for ongoing or severe symptoms during prenatal and postpartum periods; including signs of infection, high blood pressure, difficulty breathing, chest pain, or extreme swelling.
- Patients need to be educated on the role of smoking as a contributing factor to chronic disease and be provided cessation counseling.
- Prior to discharge from the hospital, patients should be educated on standard return precautions, including signs and symptoms of preeclampsia, bleeding, and infection.
- The public needs to be educated regarding not driving under the influence of alcohol, drugs, or mind-altering agents. Additionally, pregnant women should be provided education regarding the importance of wearing seat belts while in a vehicle.

Provider Education

All providers, including obstetricians/gynecologists, primary care providers, and emergency physicians should be educated on important topics that impact maternal health, including:

- Screening and treatment for postpartum depression.
- Utilization of the Screening, Brief Intervention, and Referral to Treatment (SBIRT) screening tool.
- Recognition of preeclampsia/hypertension and sepsis.
- Management of obstetric emergencies.
- Inclusion of past pregnancies in assessments so differential diagnoses are considered.
- Recognition of patients who are at high risk for cardiovascular complications, appropriate monitoring, and a mechanism for referral to a higher level of care if needed.
- The importance of comprehensive family planning counseling for all women of childbearing age with chronic medical issues and providing the contraception method of the patient's choice.

Mental Health/Substance Use Disorder

The impact of mental health conditions and substance use disorder was seen throughout the case reviews. The need for increased availability of adequate inpatient and outpatient treatment

facilities for pregnant and postpartum women remains a significant issue that needs to be addressed. Using the AL-PRAMS data, an estimated 16.5 percent of Alabama women reported depression 3 months before being pregnant. During the most recent pregnancy, 16.1 percent self-reported depression symptoms.

The AL-PRAMS includes questions about whether medical staff discussed topics related to depression and substance abuse at any prenatal care visit. The results are as follows: 24.3 percent of women reported that doctors did not ask them if they were feeling down or depressed, and 24 percent of women stated that doctors did not ask them if they were using drugs such as marijuana, cocaine, crack, or methamphetamines. At any time during the most recent pregnancy or after delivery, 18.1 percent did not receive additional information on postpartum depression (baby blues). At postpartum visits, 19.2 percent were not asked about feeling down or depressed. The next set of questions looked at depression signs after delivery. Since having the baby, 10.1 percent of women surveyed reported feeling depressed either always or very often. And 14.9 percent of women surveyed reported feeling little pleasure always or very often.

- Allocation of sustainable state funding for substance use disorder/mental health disorder treatment programs, including care coordination, for pregnant and postpartum women across the state.
- Screening by providers for mood disorders at regular intervals before, during, and after pregnancy using validated tools.
- Providers monitor patients with substance use disorder and mental health conditions closely for a year postpartum.
- Discontinuation of routine narcotic prescriptions at discharge from the hospital for patients who had an uncomplicated vaginal delivery or have a history of substance use disorder.
- Increased availability and education surrounding the use of Narcan.
- Insurance coverage for Narcan or availability free of charge.
- Public education of resources and programs for those with substance use disorder.
- Eliminate the chemical endangerment law to help encourage patients with substance use disorder to seek care when they are pregnant and promote voluntary treatment.

Care Coordination

Care coordination can be instrumental in assuring that patients are receiving all medical services needed, linking them to available resources, and providing education. To emphasize the importance of care coordination, the AL-PRAMS results have indicated the following: 38.6 percent could not get an appointment when they wanted, 32.2 percent did not have enough money or insurance to pay for the medical visit, and 13 percent reported not having access to transportation.

- Care coordination services need to be provided for women with chronic conditions or at high risk from the beginning of pregnancy through one year postpartum.
- Care coordination services provided to women in the preconception, interconception, and postpartum periods.
- Education of patients by care coordinators regarding the importance of prenatal care and postpartum follow-up, and facilitate where needed.
- Statewide care coordination for women with substance use disorder.

Facility Education

Many women use the emergency departments as their source of medical care.

- Providers at emergency departments need to be prompted to ask women about their pregnancy history on arrival.
- Facility staff need to be educated on symptoms of pre-eclampsia/eclampsia and when to call obstetricians for consultation.
- Protocols for assessing women of childbearing age.
- Implementation of hemorrhage safety bundles at all facilities.
- Legislative funding to provide ongoing comprehensive emergency management training opportunities, including life-saving management of obstetric emergencies (such as resuscitative hysterotomy/perimortem cesarean), for providers who perform emergency medicine services in rural areas.

Opportunities Moving Forward

The recommendations made by the AL-MMRC should be considered as a starting point for facilities/hospitals, providers, patients, and the state to address maternal mortality in Alabama.

- ADPH is scheduled to implement the MAP in Fiscal Year 2024. This program will provide families an opportunity to request an autopsy for maternal deaths regardless of ability to pay. The MAP's goals are to assist families in finding answers regarding their loved one's death, and to increase the percentage of maternal autopsies performed in Alabama.
- ADPH will continue to seek legislative funding to support the AL-MMRC and the MAP.
- The BFHS plans to establish a position within the MMRP to interview family members. This will provide the committee with a deeper understanding of the contributing factors and social determinants of health not found in medical records.
- The Alabama Perinatal Quality Collaborative (ALPQC) under the UAB School of Public Health was awarded funding from the Health Resources and Services Administration to identify and act on strategies to reduce maternal morbidity and mortality in Alabama. A Maternal Health Task Force (AL-MHTF) has been convened to develop a collective vision for maternal health improvement across the state and drive change.

  Several members of the AL-MMRC are a part of this task force. The AL-MHTF members will work over the next five years to build and update a strategic plan to address the following key areas necessary to improving maternal health including:

  - Growing and strengthening the maternal health workforce
  - Improving access to continuous, high-quality clinical care
  - Increasing community engagement
  - Improving data capacity through a health equity lens

  Additional information can be found at almhtf.org.

- The USA Children's and Women's Hospital has initiated a postpartum home blood pressure monitoring project to increase surveillance of hypertension in the postpartum period. They have also included a "bracelet component" to the project. All patients discharged following a completed pregnancy are asked to wear a "maternal health bracelet" that is pertinent to their delivery status for 6 weeks. The bracelet is intended to alert healthcare providers that a patient's complaint may be related to a recent pregnancy. ADPH, along with other partners, is planning to implement the bracelet component in other delivering hospitals throughout the state in the near future.

  Additional information can be found at usahealthsystem.com/news/medical-bracelets-new-mothers.

- The ALPQC will be launching the Obstetric Hemorrhage Initiative in January 2024 in collaboration with hospitals and providers throughout the state. The key goals will be to increase the percentage of patients who receive a hemorrhage risk assessment, increase the use of quantification of blood loss, ensure patients who experience an obstetric hemorrhage receive a trauma-informed briefing of the event prior to discharge, and to narrow the black/white inequities in severe maternal morbidity among patients that experience an obstetric hemorrhage.

  Additional information can be found at sites.uab.edu/alpqc-backup-feb2023 and saferbirth.org/psbs/obstetric-hemorrhage.

- To increase access to maternal health care, the Perinatal Division at ADPH is pursuing telehealth and group prenatal care in counties without a delivering medical provider.