

ALABAMA PUBLIC HEALTH

Alabama Department of Public Health Bureau of Family Health Services

Alabama Fetal and Infant Mortality Review for 2019-2023

Alabama Department of Public Health Perinatal Program

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We would like to thank the members of the State Perinatal Advisory Committee, Regional Perinatal Advisory Committee, Case Review Teams (CRTs), and the Community Action Teams (CATs) for volunteering their time and expertise. The objectives of the Alabama Fetal and Infant Mortality Review (AL-FIMR) Program could not be achieved without the commitment, assistance, and ongoing support of these members.

A special thanks to the parents who have shared their most personal experiences in the expectation that they may help other families. Thank you for opening your hearts. We commend you for your courage and willingness to share your experience with us.

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Forward

The purpose of this report is to describe the AL-FIMR Program activities from 2019-2023.

Fetal mortality is defined as death occurring in-utero at 20 weeks gestation or greater. Infant mortality is defined as the death of an infant prior to his or her first birthday.

The AL-FIMR Program complements other studies of fetal and infant death but uses an approach that is community-based and designed to bring together local health providers, consumers, advocates, and leaders. The AL-FIMR Program identifies strengths, areas for improvement in overall service systems, and community resources for women, children, and families. The AL-FIMR Program also provides direction toward the development of new policies to safeguard families. Through the regular collection, analysis, and sharing of health data and information about risks and resources in a community, the AL-FIMR Program identifies trends in fetal and infant mortality and the factors that may be involved.

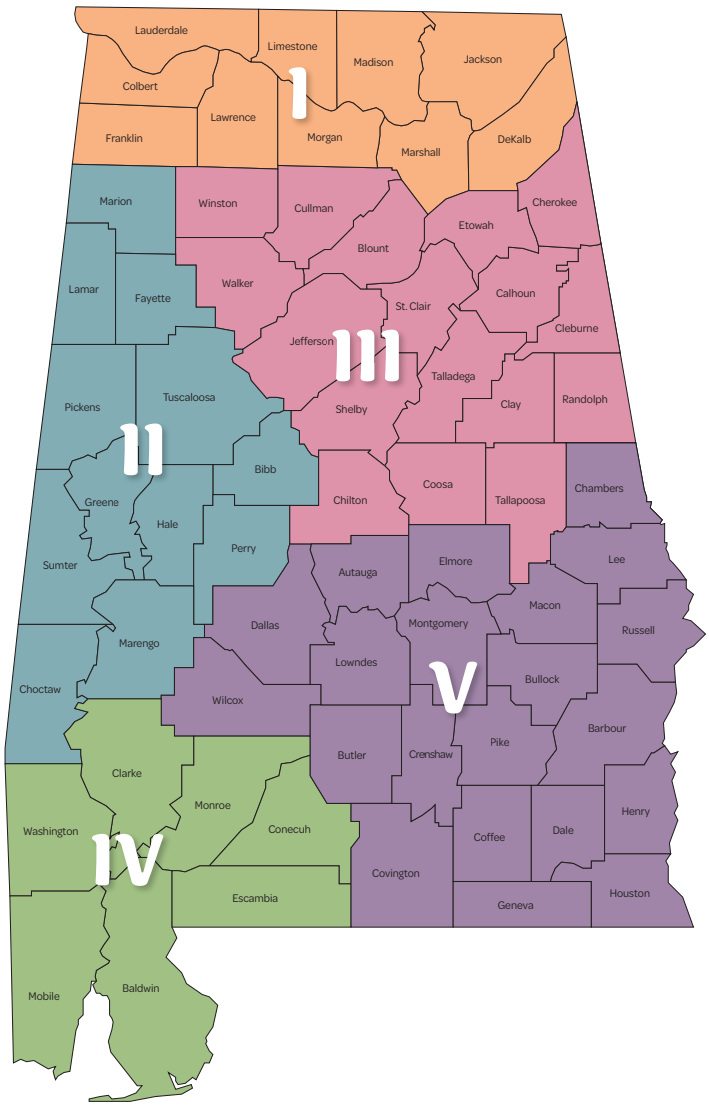
The AL-FIMR Program has proven beneficial to many communities. The program has helped identify gaps in current services and collaborates to fill those gaps. Services have been expanded and improved through cooperative programming and joint funding. Enhanced coordination of services through interagency networking, communication, and collaboration has occurred in communities that have implemented the program. The AL-FIMR Program helps communities prepare and deliver culturally sensitive interventions to improve service systems and resources for their multi-ethnic populations; and contributes to a greater understanding of maternal and child health community needs by assisting the community in seeing not just a part but the whole picture; and offer a means to implement needs assessment, quality assurance, and policy development, which are essential public health functions.



Background

The AL-FIMR Program has developed a community-based case review process to identify trends in fetal and infant mortality at the regional level and statewide. Identifying the contributors to infant and fetal mortality is essential for the AL-FIMR Program and its partners to improve maternal and child health outcomes through the implementation of community-based actions.

Map 1. Alabama, by Perinatal Region



Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program

As shown in Map 1, Alabama is divided into five perinatal regions. The nurse supervisor serves as the regional coordinator along with the perinatal abstractors for each perinatal region. During the comprehensive review process, the regional team creates a case summary report using the following data sources:

- Mother and Family Interviews
- Birth Abstracts and Death Certificates
- Medical Records and Physician Office Records
- Autopsy Report
- Police and Social Records

Figure 1. Primary Data Elements Captured

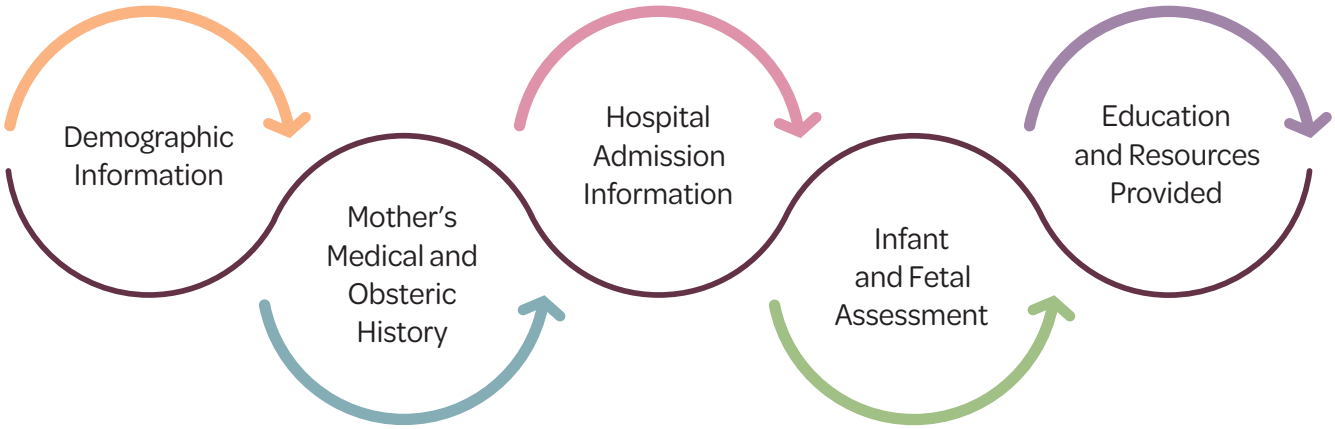


Figure 1 looks at the key data elements included in a case summary report, which is stored in a data system called SWADDLE.

Figure 2. Logic Model of the AL-FIMR Program



Using the logic model presented in Figure 2, the AL-FIMR Program monitors the effectiveness of the intervention on infant and fetal mortality. After data collection, the CRTs meet monthly to discuss and identify health system and community factors that may have contributed to the death. The findings are then presented to the CATs where regional or statewide interventions can be planned to reduce infant and fetal mortality.

AL-FIMR Program Exclusion Rules

Based on protocol, a case summary report will not be completed if the following situations occur:

- Fetal deaths in Regions I, III, and V (Fetal death reviews are only completed in Regions II and IV)
- Homicide related deaths

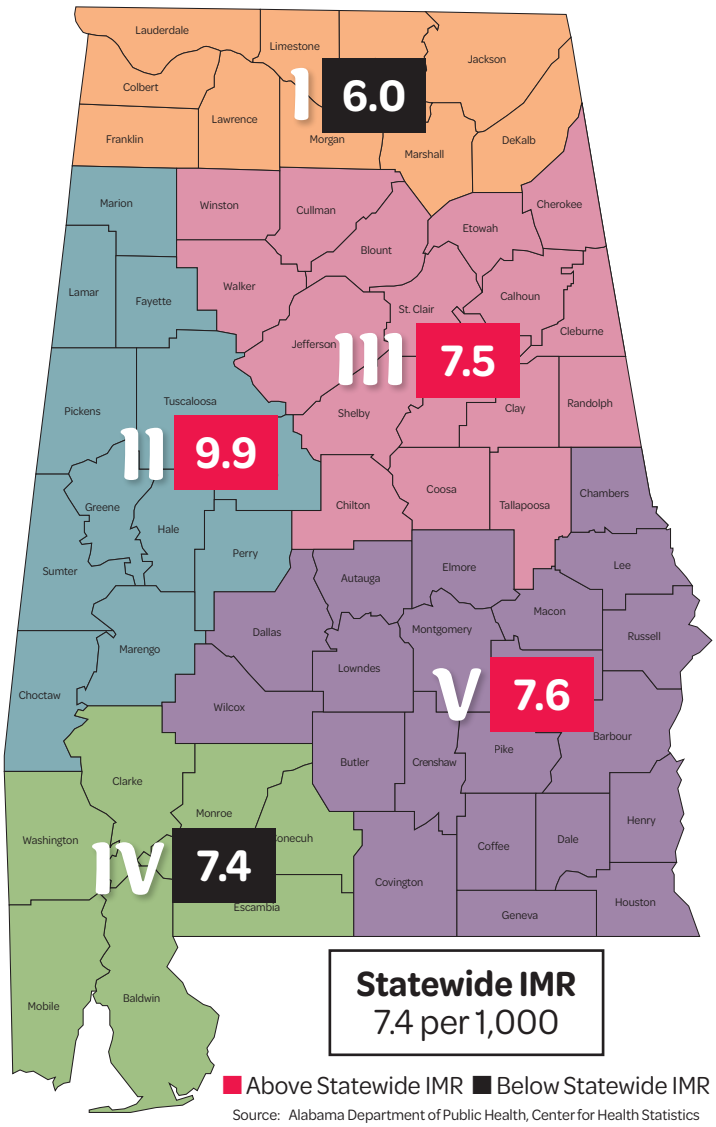
Alabama Center for Health Statistics (AL-CHS) Overview

The state overview covers infant and fetal mortality trends during the 5-year time frame covered between 2019 and 2023.

Infant Mortality

During the 5-year time frame, Alabama experienced an infant mortality rate (IMR) of 7.4 per 1,000 live births. As shown in Map 2, the regional IMRs marked in red were above the statewide IMR of 7.4 per 1,000 live births. Compared to other regions, Region II had the highest IMR. Table 1 compares the annual IMR for the United States and Alabama. Compared to the United States, the annual statewide IMRs were higher.

Map 2. Regional IMRs, 2019 - 2023†



Source: Alabama Department of Public Health, Center for Health Statistics
† Infant mortality rates per 1,000 live births.

Table 1. Alabama Statewide Infant Mortality Overview, 2019-2023

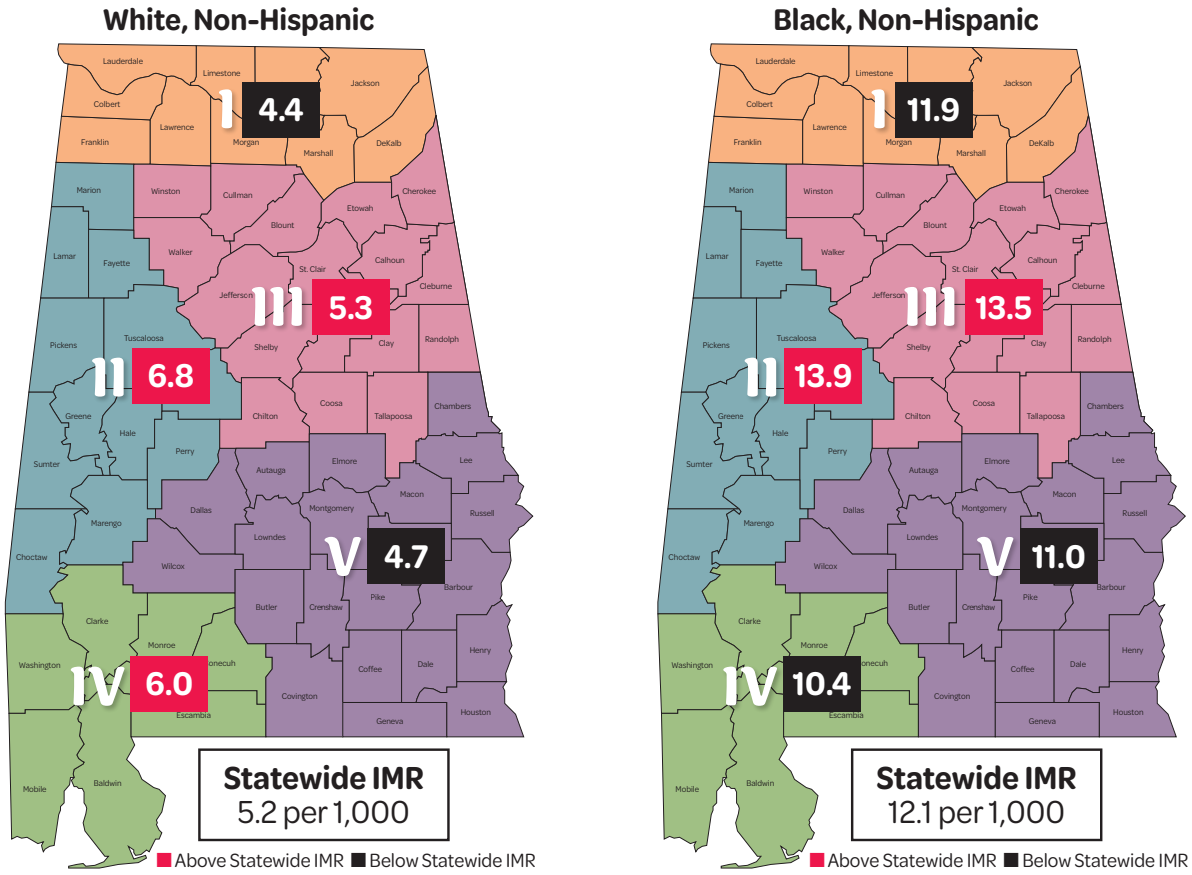
Alabama and National IMRs			
	Alabama[1]		
Year	Death	Births	Rate†
2019	449	58,615	7.7
2020	404	57,643	7.0
2021	443	58,040	7.6
2022	391	58,162	6.7
2023	449	57,835	7.8
Total	2,136	290,295	7.4
	United States[2]		
Year	Death	Births	Rate†
2019	20,927	3,747,540	5.6
2020	19,578	3,613,647	5.4
2021	19,928	3,664,292	5.4
2022	20,577	3,667,758	5.6
2023	20,145	3,596,017	5.6
Total	100,525	18,289,254	5.5

Sources: 1 Alabama Department of Public Health, Center for Health Statistics.
2 Centers for Disease Control and Prevention, WONDER data.
† Infant mortality rate per 1,000 live births. The United States infant death total used for 2023 was provisional at time of data analysis.

Infant Mortality Trends

Map 3 uses the AL-CHS data to compare the regional IMR among black and white mothers not identifying as Hispanic ethnicity. The regional IMRs marked in red were above the statewide IMR rates reported for these racial groups. Compared to white, non-Hispanic mothers, black, non-Hispanic mothers experienced higher rates of infant mortality across all the perinatal regions. Of note, racial disparities among black, non-Hispanic mothers were more than double those of white, non-Hispanic mothers across all perinatal regions.

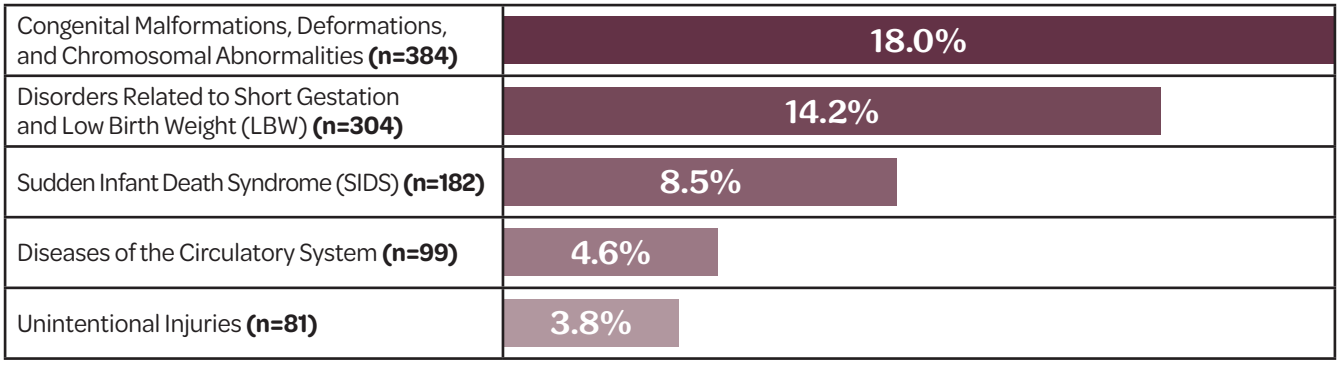
Map 3. Regional IMRs by Race/Ethnicity, 2019 - 2023†



Source: Alabama Department of Public Health, Center for Health Statistics
† Infant mortality rates per 1,000 live births.

Figure 3 shows the top five leading causes of infant deaths in Alabama between 2019 and 2023. Congenital malformations were the leading cause of death and contributed to **18.0 percent (n=384/2,136)** of the infant deaths reported within this time frame.

Figure 3. Alabama Top 5 Leading Causes of Infant Deaths (n=2,136), 2019 - 2023

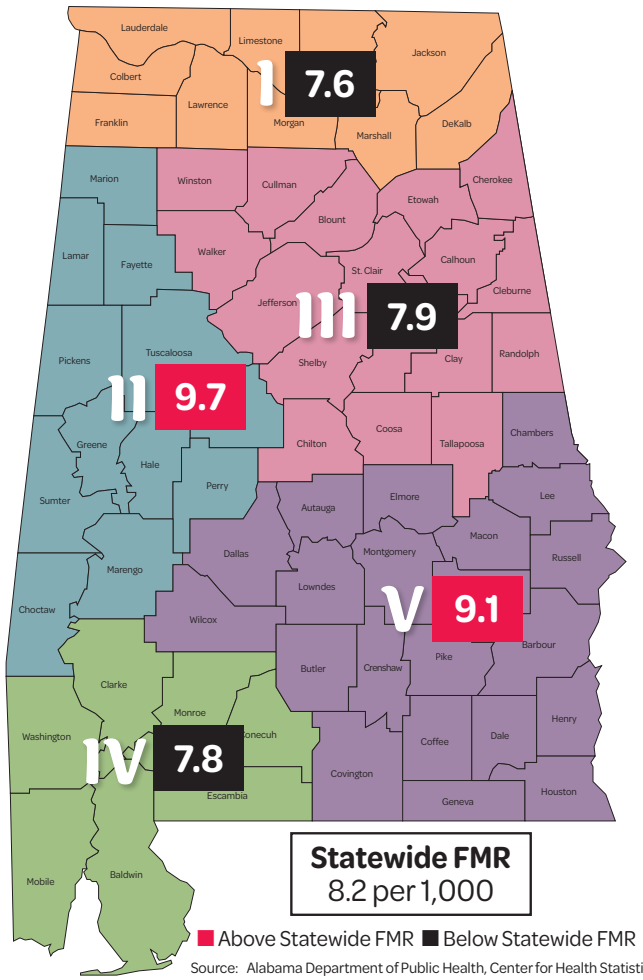


Source: Alabama Department of Public Health, Center for Health Statistics

Fetal Mortality

During the 5-year time frame, Alabama experienced a Fetal Mortality Rate (FMR) of 8.2 per 1,000 live births. Within Map 4, the regional FMRs marked in red were above the statewide FMR of 8.2 per 1,000. Similar to infant mortality, Region II had the highest FMR. Table 2 compares the annual FMR for the United States and Alabama. Compared to the United States, the statewide annual FMRs for the available years were higher.

Map 4. Regional FMRs, 2019 - 2023†



Source: Alabama Department of Public Health, Center for Health Statistics
† Fetal mortality rate per 1,000 live births.

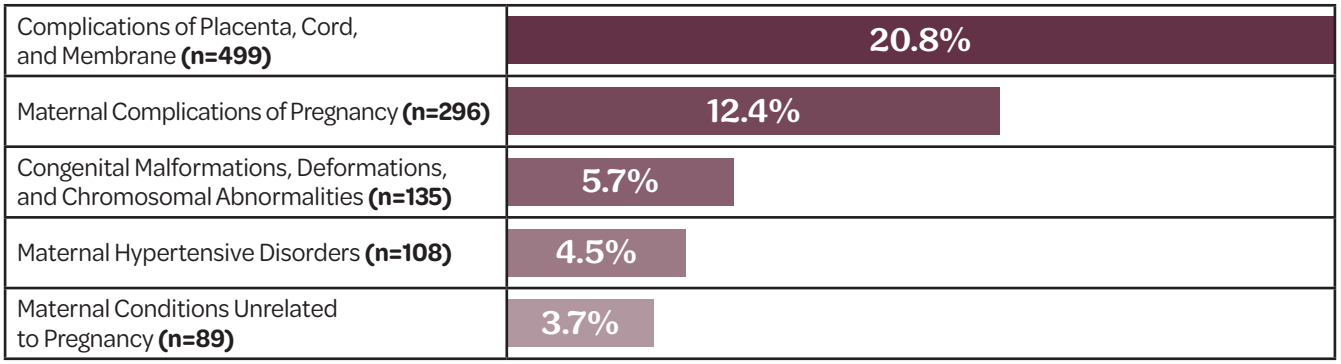
Table 2. Alabama Statewide Fetal Mortality Overview, 2019 - 2023

Alabama and National IMRs			
	Alabama[1]		
Year	Death	Births	Rate†
2019	525	58,615	9.0
2020	491	57,643	8.5
2021	510	58,040	8.8
2022	427	58,162	7.3
2023	436	57,835	7.5
Total	2,389	290,295	8.2
	United States[2]		
Year	Death	Births	Rate†
2019	21,478	3,747,540	5.7
2020	20,854	3,613,647	5.8
2021	21,105	3,664,292	5.8
2022	20,202	3,667,758	5.5
2023	-	-	-
Total	-	-	-

Sources: 1 Alabama Department of Public Health, Center for Health Statistics.
2 Centers for Disease Control and Prevention, WONDER data.
† Fetal mortality rate per 1,000 live births. The United States fetal death total used for 2023 was provisional at the time of data analysis.

Figure 4 shows the top five leading causes of fetal deaths in Alabama between 2019 and 2023. Complications involving the placenta, cord, and membrane were the leading cause of death and contributed to **20.8 percent (n=499/2,389)** of the fetal deaths reported within this time frame.

Figure 4. Alabama's Top 5 Leading Causes of Fetal Deaths (n=2,389), 2019 - 2023

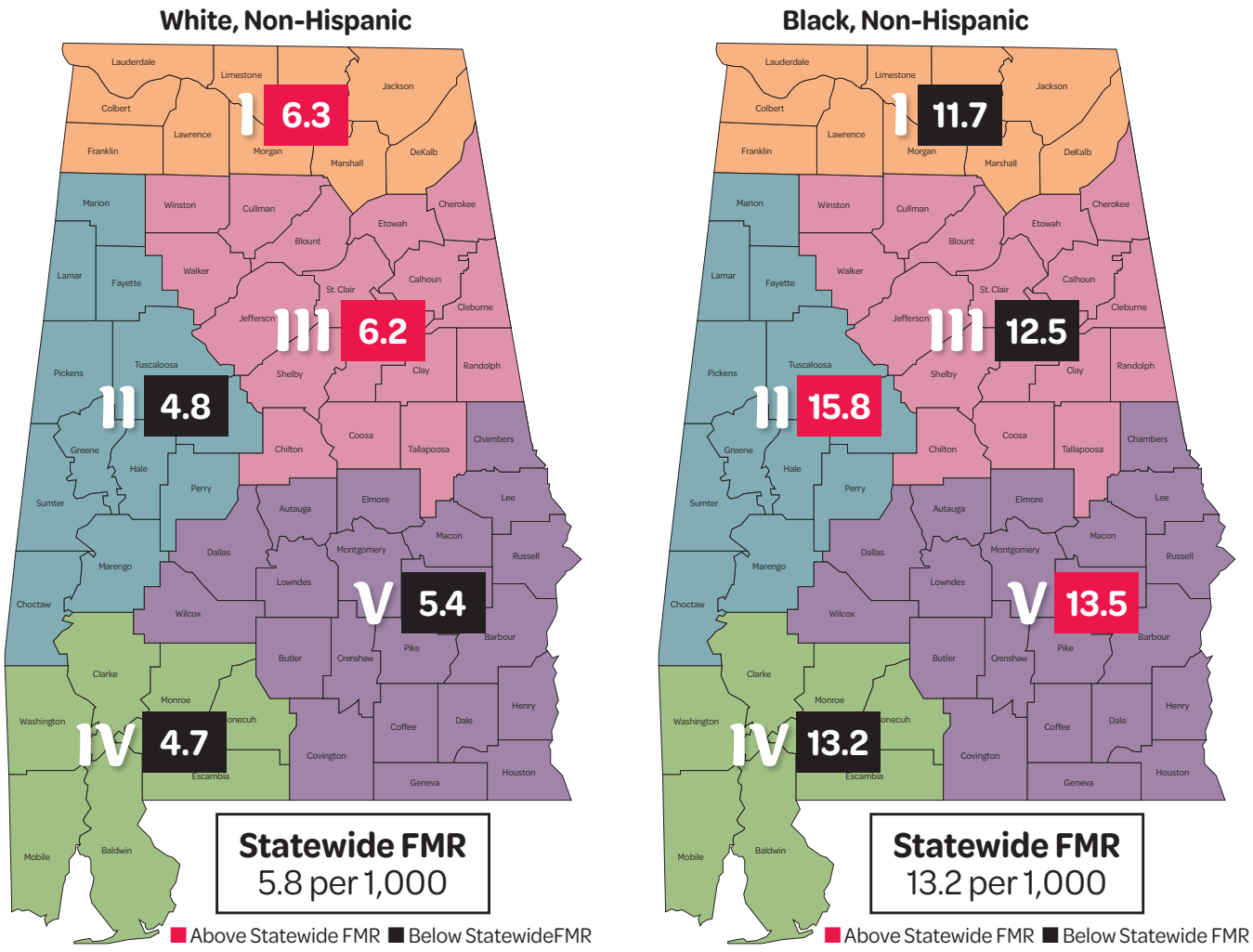


Source: Alabama Department of Public Health, Center for Health Statistics

Fetal Mortality Trends

Map 5 uses AL-CHS data to compare the regional FMR among black, non-Hispanic and white, non-Hispanic mothers. The regional FMRs marked in red were above the statewide FMR rates reported for these racial groups. Compared to white, non-Hispanic mothers, black, non-Hispanic mothers also experienced higher rates of fetal mortality across all the perinatal regions. Of note, racial disparities among black, non-Hispanic mothers were more than double those of white, non-Hispanic mothers across all perinatal regions except for the FMR in Region I depicted in Map 5.

Map 5. Regional FMRs by Race/Ethnicity, 2019 - 2023†



Source: Alabama Department of Public Health, Center for Health Statistics
† Fetal mortality rate per 1,000 live births.

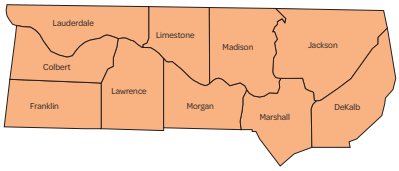
As shown in Map 5, similar racial disparities are depicted where the FMR among white, non-Hispanic mothers residing in Regions I and III was above the statewide rate of 5.8 and the FMR among black, non-Hispanic mothers in Regions II and V was above the statewide rate of 13.2 per 1,000 live births.

Regional Overview

The next section includes a regional snapshot on the burden of infant and fetal mortality. To prevent future infant and fetal morality, the outreach activities completed by the regional coordinators are highlighted.

Region I Overview

The leading cause of infant death in Region I was congenital malformations, deformations, and chromosomal abnormalities, and the leading cause of fetal death was maternal complications of pregnancy.



According to the AL-CHS, **366** infant deaths and **462** fetal deaths occurred within Region I. Of these, the AL-FIMR Region I Coordinator completed a case summary report for **67.0 percent (n=245/366)** of the infant deaths.

Table 3. Region I Infant Mortality Overview, 2019 - 2023

	Region I and Alabama IMRs					
	Region I			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	77	11,812	6.5	449	58,615	7.7
2020	75	11,956	6.3	404	57,643	7.0
2021	73	12,210	6.0	443	58,040	7.6
2022	68	12,484	5.4	391	58,162	6.7
2023	73	12,670	5.8	449	57,835	7.8
Total	366	61,132	6.0	2,136	290,295	7.4

Source: Alabama Department of Public Health, Center for Health Statistics.
† Infant mortality rate per 1,000 live births.

Figure 5. Region I Top 5 Leading Causes of Infant Deaths (n=366), 2019 - 2023

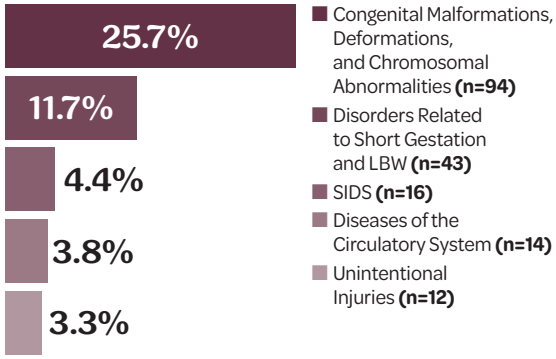
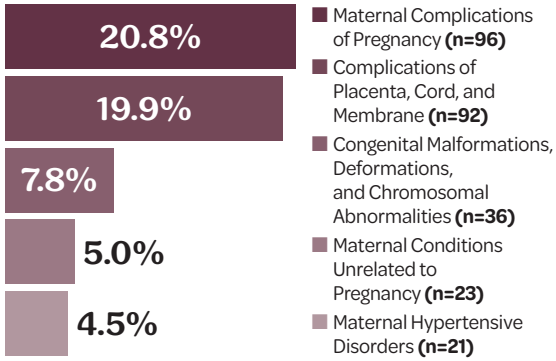


Table 4. Region I Fetal Mortality Overview, 2019 - 2023

	Region I and Alabama FMRs					
	Region I			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	94	11,812	8.0	525	58,615	9.0
2020	98	11,956	8.2	491	57,643	8.5
2021	104	12,210	8.5	510	58,040	8.8
2022	70	12,484	5.6	427	58,162	7.3
2023	96	12,670	7.6	436	57,835	7.5
Total	462	61,132	7.6	2,389	290,295	8.2

Source: Alabama Department of Public Health, Center for Health Statistics.
† Fetal mortality rate per 1,000 live births.

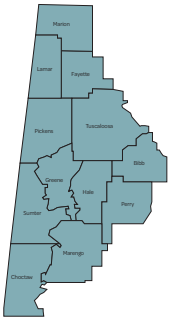
Figure 6. Region I Top 5 Leading Causes of Fetal Deaths (n=366), 2019 - 2023



AL-FIMR Region I Activities

- Distributed **138** Pack-n-Plays from Cribs for Kids® to families in Region I in 2023.
- Participation by Huntsville Hospital in the "Clear the Crib" social media challenge.
- Partnered with CAT and local organizations for Infant Loss and Awareness Day Remembrance.
- Partnered with CAT and Madison Mission Seventh Day Aventist and Zeta Omicron to provide resources to expecting families.
- Collaborated with Babypalooza to provide resources and education to those who attended.
- Partnered with CAT and Decatur Hospital to provide breastfeeding education to the community.
- Partnered with State Child Death Review to provide education to local law enforcement and coroners on the importance of the Sudden Unexplained Infant Death (SUID) Investigation form for the review process.
- Mailed Safe Sleep door hangers to Region I delivering hospitals.
- Mailed Count the Kicks brochures and kick bands to Region I obstetrics/gynecology providers and hospitals.

Region II Overview



The leading cause of infant death in Region II was disorders related to short gestation and LBW, and the leading cause of fetal death was complications involving the placenta, cord, and membrane.

For this time frame, **223** infant deaths and **218** fetal deaths occurred within Region II. The AL-FIMR Region II Coordinator has completed a case summary report for **82.1 percent (n=183/223)** of the infant deaths and 63.8 percent **(n=139/218)** of the fetal deaths. Compared to the statewide rates, Region II has higher infant and fetal mortality rates.

Table 5. Region II Infant Mortality Overview, 2019 - 2023

	Region II and Alabama IMRs					
	Region II			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	54	4,628	11.7	449	58,615	7.7
2020	34	4,566	7.4	404	57,643	7.0
2021	44	4,386	10.0	443	58,040	7.6
2022	41	4,506	9.1	391	58,162	6.7
2023	50	4,395	11.4	449	57,835	7.8
Total	223	22,481	9.9	2,136	290,295	7.4

Source: Alabama Department of Public Health, Center for Health Statistics.
† Infant mortality rate per 1,000 live births.

Figure 7. Region II Top 5 Leading Causes of Infant Deaths (n=223), 2019 - 2023

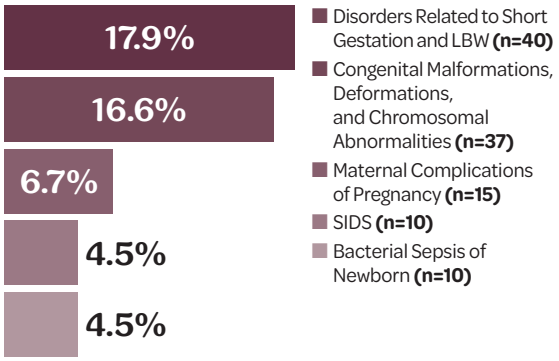
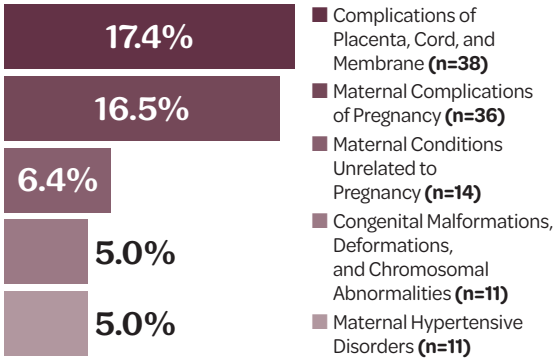


Table 6. Region II Fetal Mortality Overview, 2019 - 2023

	Region II and Alabama FMRs					
	Region II			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	60	4,628	13.0	525	58,615	9.0
2020	40	4,566	8.8	491	57,643	8.5
2021	53	4,386	12.1	510	58,040	8.8
2022	40	4,506	8.9	427	58,162	7.3
2023	25	4,395	5.7	436	57,835	7.5
Total	218	22,481	9.7	2,389	290,295	8.2

Source: Alabama Department of Public Health, Center for Health Statistics.
† Fetal mortality rate per 1,000 live births.

Figure 8. Region II Top 5 Leading Causes of Fetal Deaths (n=218), 2019 - 2023



AL-FIMR Region II Activities

- Distributed **31** Pack-n-Plays from Cribs for Kids® to families in Region II in 2023.
- Conducted Breastfeeding Peer Support Group Sessions at the Tuscaloosa County Health Department.
- Made lactation tents available to mothers attending University of Alabama athletic events.
- Provided COVID-19 education at all attended community events.
- Provided safe sleep education throughout Region II to include diverse cultural backgrounds.
- Collaborated with the Tuscaloosa Latino Coalition for a Substance Abuse and Mental Health Services Administration (SAMHSA) grant to bring maternal mental health and substance abuse disorder awareness to West Alabama.
- Completed community home visits to offer education and grief support following infant deaths in Region II.
- Conducted participant intervention development study about how to increase the accessibility and availability of maternity services in Region II.
- Shared Low-dose Aspirin Webinar presented by the March of Dimes with Region II providers.
- Provided Star Legacy Foundation grief resources to families throughout Region II.

Region III Overview

The leading cause of infant death in Region III was congenital malformations, deformations, and chromosomal abnormalities, and the leading cause of fetal death was complications involving the placenta, cord, and membrane.

For this time frame, **717** infant deaths and **761** fetal deaths occurred within Region III. The AL-FIMR Region III Coordinator has completed a case summary report for **77.5 percent (n=556/717)** of the infant deaths.

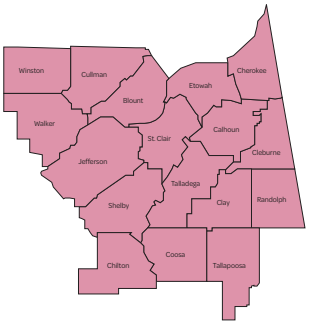


Table 7. Region III Infant Mortality Overview, 2019 - 2023

	Region III and Alabama IMRs					
	Region III			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	154	19,672	7.8	449	58,615	7.7
2020	124	18,936	6.5	404	57,643	7.0
2021	145	19,245	7.5	443	58,040	7.6
2022	129	19,191	6.7	391	58,162	6.7
2023	165	19,103	8.6	449	57,835	7.8
Total	717	96,147	7.5	2,136	290,295	7.4

Source: Alabama Department of Public Health, Center for Health Statistics.
† Infant mortality rate per 1,000 live births.

Figure 9. Region III Top 5 Leading Causes of Infant Deaths (n=717), 2019 - 2023

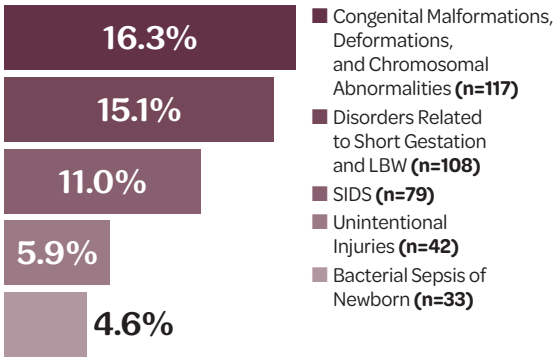
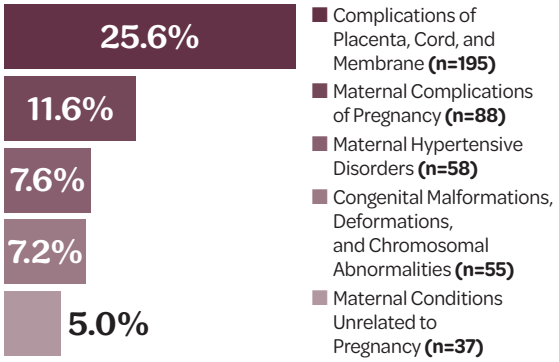


Table 8. Region III Fetal Mortality Overview, 2019 - 2023

	Region III and Alabama FMRs					
	Region III			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	172	19,672	13.0	525	58,615	9.0
2020	155	18,936	8.8	491	57,643	8.5
2021	156	19,245	12.1	510	58,040	8.8
2022	139	19,191	8.9	427	58,162	7.3
2023	139	19,103	5.7	436	57,835	7.5
Total	761	96,147	7.9	2,389	290,295	8.2

Source: Alabama Department of Public Health, Center for Health Statistics.
† Fetal mortality rate per 1,000 live births.

Figure 10. Region III Top 5 Leading Causes of Fetal Deaths (n=761), 2019 - 2023



AL-FIMR Region III Activities

- Distributed **177** Pack-n-Plays from Cribs for Kids® to families in Region III in 2023.
- Established three CATs in Calhoun, Walker, and Jefferson Counties.
- Provided education on SIDS/SUIDs, safe sleep practices, breastfeeding support, and the importance of attending postpartum follow-up appointments at numerous locations.
- Partnered with the Alabama Coordinated Health Network Coordinators to complete referrals for Cribs for Kids® throughout Region III.
- Vendored for 16 Community Baby Showers and Resource Fairs held throughout Region III.
- Participated with Talladega Clay Randolph Childcare as an advisory board member.
- Partnered with the Children's Policy Council (CPC) to plan and assist in hosting the first Townsend Resource Fair at Tarrant School.
- Partnered with Babypalooza to provide resources and education to attendees.
- Partnered with the Maternal and Child Health/ March of Dimes Substance Abuse Leadership Team to help develop goals/initiatives for distribution of funds from Opioid Settlement Funds.
- Partnered with the Alabama Perinatal Quality Collaborative Leadership Team to help develop yearly initiatives for maternal/neonatal projects.
- Partnered with the Shelby Parental Involvement Committee through CPC to plan the Annual Child Abuse Prevention Event held in April.
- Participated in the Annual Shelby County Sheriff's Office National Night Out to provide safe sleep education and maternal mental health resources.

Region IV Overview

The leading cause of infant death in Region IV was disorders related to short gestation and LBW, and the leading cause of fetal death was complications involving the placenta, cord, and membrane.

For this time frame, **327** infant deaths and **345** fetal deaths occurred within Region IV. The AL-FIMR Region IV Coordinator has completed a case summary report for **65.4 percent (n=214/327)** of the infant deaths and **57.1 percent (n=197/345)** of the fetal deaths.

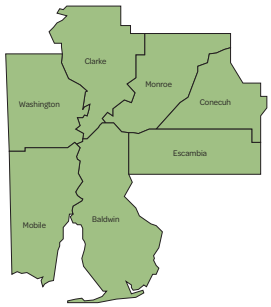


Table 9. Region IV Infant Mortality Overview, 2019 - 2023

	Region IV and Alabama IMRs					
	Region IV			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	57	9,004	6.3	449	58,615	7.7
2020	70	8,823	7.9	404	57,643	7.0
2021	74	8,863	8.3	443	58,040	7.6
2022	65	8,815	7.4	391	58,162	6.7
2023	61	8,707	7.0	449	57,835	7.8
Total	327	44,212	7.4	2,136	290,295	7.4

Source: Alabama Department of Public Health, Center for Health Statistics.
† Infant mortality rate per 1,000 live births.

Figure 11. Region IV Top 5 Leading Causes of Infant Deaths (n=327), 2019 - 2023

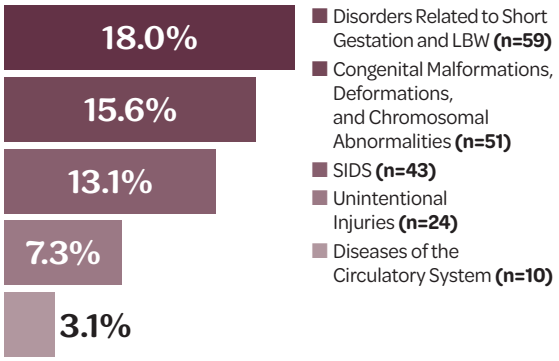
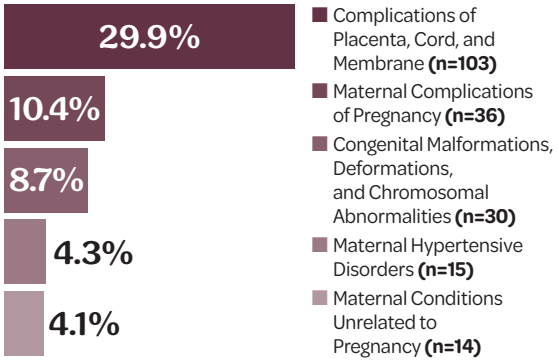


Table 10. Region IV Fetal Mortality Overview, 2019 - 2023

	Region IV and Alabama FMRs					
	Region IV			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	63	9,004	7.0	525	58,615	9.0
2020	81	8,823	9.2	491	57,643	8.5
2021	72	8,863	8.1	510	58,040	8.8
2022	69	8,815	7.8	427	58,162	7.3
2023	60	8,707	6.9	436	57,835	7.5
Total	345	44,212	7.8	2,389	290,295	8.2

Source: Alabama Department of Public Health, Center for Health Statistics.
† Fetal mortality rate per 1,000 live births.

Figure 12. Region IV Top 5 Leading Causes of Fetal Deaths (n=345), 2019 - 2023



AL-FIMR Region IV Activities

- Distributed **110** Pack-n-Plays from Cribs for Kids® to families in Region IV in 2023.
- Partnered with Alabama Coordinated Health Network (ACHN) Coordinators to complete referrals for Cribs for Kids® throughout Region IV.
- Established three CATs in Baldwin and Escambia Counties, and the Tri-County area which includes Washington, Clarke, and Monroe Counties.
- Offered parenting classes throughout Region IV and incentive items to complete the courses.
- Partnered with the Alabama Cooperative Extension Service to host four Community Safety Baby Showers in Washington, Mobile, Baldwin, and Conecuh Counties.
- The Tri-County Team developed a Collaborative Resource Team that invites various partners to share what services they have available.
- Connected University of South Alabama (USA) Children's and Women's Hospital with Champs National to promote breastfeeding.
- Partnered with the Baldwin County CAT and University of South Alabama (USA) Children's and Women's Hospital to connect families with a Neonatal Intensive Care Unit (NICU) infant with the Skylar Project.
- Hosted a Bump and Beyond Panel for pregnant mothers to discuss health issues and access to care in Mobile and Baldwin Counties.
- Partnered with USA to host a Special Needs Resource Fair.
- Distributed information, in-services, and webinars regarding Maternal Child Health with regional healthcare partners.
- Worked with seven participants to complete the National Child Passenger Safety Certification Course.

Region V Overview

The leading cause of infant death in Region V was congenital malformations, deformations, and chromosomal abnormalities, and the leading cause of fetal death was complications involving the placenta, cord, and membrane.

For this time frame, **503** infant deaths and **603** fetal deaths occurred within Region V. The AL-FIMR Region V Coordinator has completed a case summary report for 31.6 percent (n=159/503) of the infant deaths.

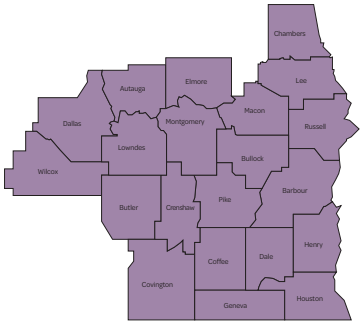


Table 11. Region V Infant Mortality Overview, 2019 - 2023

	Region V and Alabama IMRs					
	Region V			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	107	13,499	7.9	449	58,615	7.7
2020	101	13,362	7.6	404	57,643	7.0
2021	107	13,336	8.0	443	58,040	7.6
2022	88	13,166	6.7	391	58,162	6.7
2023	100	12,960	7.7	449	57,835	7.8
Total	503	66,323	7.6	2,136	290,295	7.4

Source: Alabama Department of Public Health, Center for Health Statistics.
† Infant mortality rate per 1,000 live births.

Figure 13. Region IV Top 5 Leading Causes of Fetal Deaths (n=503), 2019 - 2023

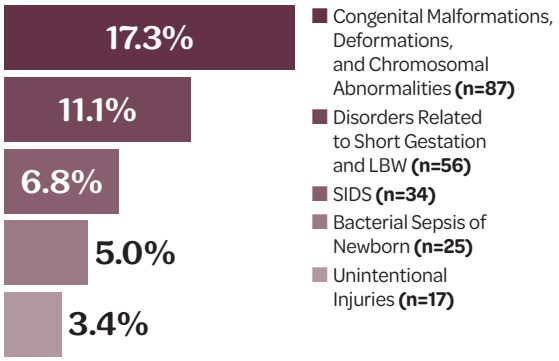
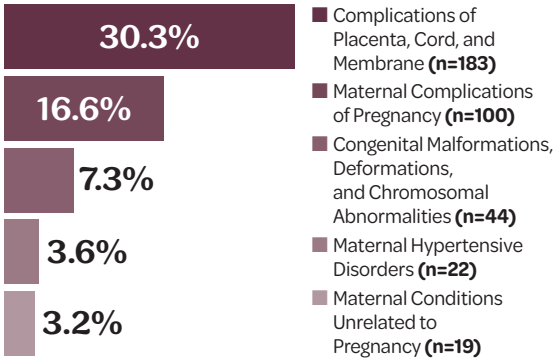


Table 12. Region V Fetal Mortality Overview, 2019 - 2023

	Region V and Alabama FMRs					
	Region V			Alabama		
Year	Death	Births	Rate†	Death	Births	Rate†
2019	136	13,499	10.1	525	58,615	9.0
2020	117	13,362	8.8	491	57,643	8.5
2021	125	13,336	9.4	510	58,040	8.8
2022	109	13,166	8.3	427	58,162	7.3
2023	116	12,960	9.0	436	57,835	7.5
Total	603	66,323	9.1	2,389	290,295	8.2

Source: Alabama Department of Public Health, Center for Health Statistics.
†Fetal mortality rate per 1,000 live births.

Figure 14. Region IV Top 5 Leading Causes of Fetal Deaths (n=603), 2019 - 2023



AL-FIMR Region V Activities

Although the Region V Coordinator position is vacant, the following outreach activities are still taking place within Region V.

- Distributed **271** Pack-n-Plays from Cribs for Kids® to families in Region V in 2023.
- Partnered with ACHN Coordinators to complete referrals for Cribs for Kids® throughout Region V.

Recommendations

After reviewing the cases between 2019 and 2023, the AL-FIMR Program has developed specific recommendations to promote, protect, and improve Alabama's health.

Case Management Services

- Enhance and improve knowledge of community services available
- Improve access to maternity care program registration by enhancing and improving communication with patients regarding the Medicaid process to facilitate a more timely approval

Coordination of Care

- Strengthen coordination between local agencies and programs to increase knowledge of available resources; specifically targeting mental health and substance abuse among providers, agencies, and programs
- Strengthen coordination between emergency room providers and obstetricians of patients who visit the emergency room

Emergency Services/Law Enforcement

- Enhance death scene investigation protocols and documentation of infant deaths
- Advocate and educate county coroners and the public regarding the mandatory scene investigations when an infant dies, particularly for those occurring outside the hospital setting
- Enhance and improve bereavement service referrals by coroners in all cases of infants discovered dead in the home

Family Planning

- Provide education about the importance of appropriate birth spacing; the importance of being healthy before pregnancy or the importance of family planning, preconception, and interconception care; and referral and utilization of family planning options for women experiencing a fetal or infant loss
- Provide birth control in the immediate postpartum period

Grief Support/Bereavement Services

- Provide grief counseling/support information on available services and referrals to community agencies for grief counseling



Social Determinants of Health

Figure 15. Social Determinants of Health

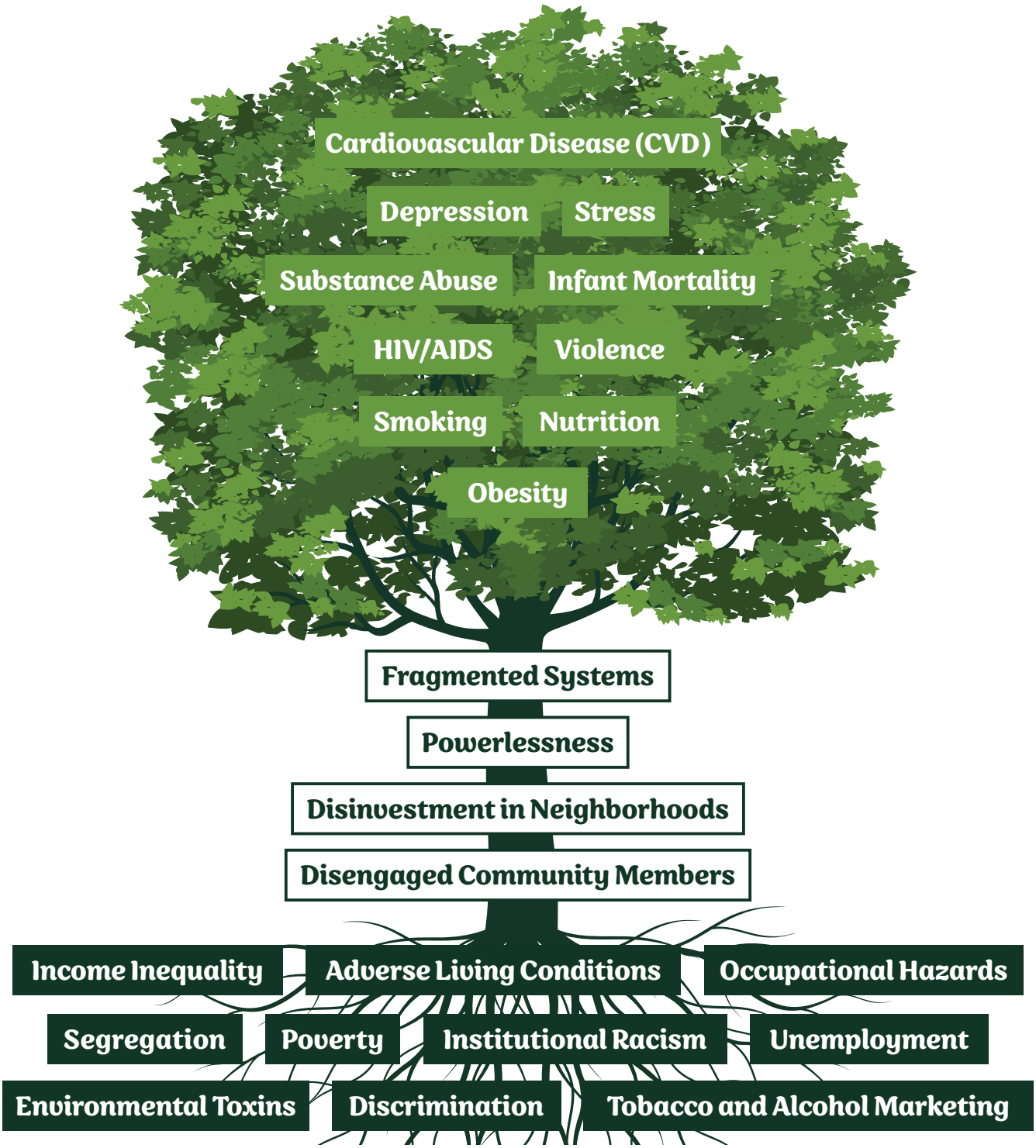


Figure 15 illustrates how the root causes in various systems can cause health consequences to grow over time. These are the social and economic conditions that influence the health of people and their communities. Each cause impacts health and well-being and must be addressed in order to eliminate disparities in birth outcomes. The AL-FIMR Program findings will look at the factors contributing to adverse infant and maternal health outcomes.

AL-FIMR Program Case Review Findings

Maternal Characteristics

Between 2019 and 2023, the AL-FIMR Program completed 1,703 case summary reports. Of these, **79.7 percent (n=1,357/1,703)** were infant deaths, and **20.3 percent (n=346/1,703)** were fetal deaths. As shown in Table 13, over half of the reviewed cases were between the ages of 20 and 39. Compared to white mothers, black mothers had a slightly higher percentage of having either an infant or fetal death. Close to half of the mothers had Medicaid insurance when receiving prenatal care. Over **80 percent (n=81.8 percent)** of mothers had completed at least a high school education or higher. Knowing the characteristics of these mothers is important for the implementation of future interventions.

Table 13. Maternal Characteristics Among Cases Reviewed by the AL-FIMR Program, 2019 - 2023†

Maternal Characteristics	Count	Percent
Age		
Less than 20 Years Old	147	8.6
20-29 Years Old	941	55.3
30-39 Years Old	563	33.1
Older than 39 Years Old	50	2.9
Unknown	2	< 1.0
Race		
Black	850	49.9
White	731	42.9
Other	116	6.8
Unknown	6	< 1.0
Ethnicity		
Hispanic	153	9.0
Non-Hispanic	1,076	63.2
Unknown	474	27.8
Method of Payment at Prenatal Care		
Medicaid	828	48.6
Private	535	31.4
Other	49	2.9
Self-Pay	48	2.8
Unknown	243	14.3
Education		
Less than High School	67	3.9
Attended High School, Not Completed	211	12.4
High School or GED Completed	678	39.8
College or Higher	714	42.0
Unknown	33	1.9
Total	1,703	100.0

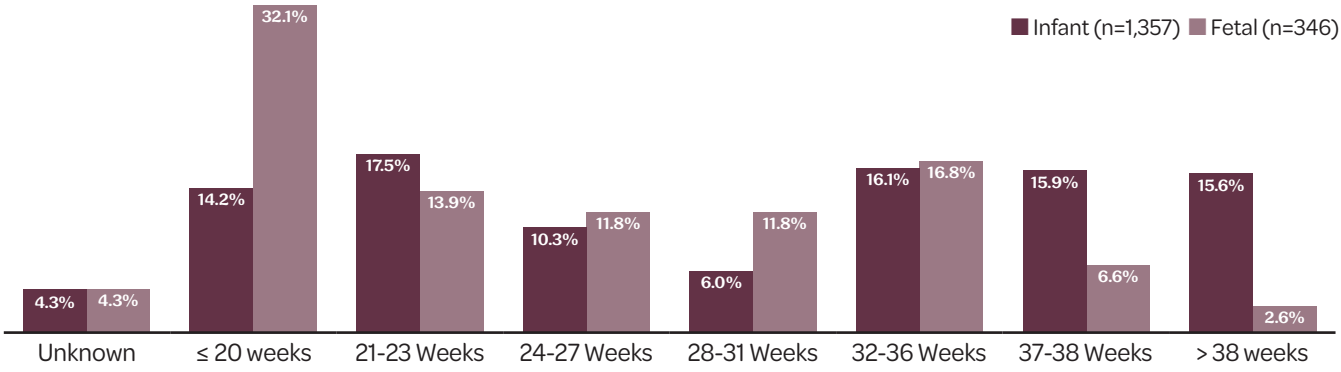
Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program
† Characteristic totals may not equal 100 percent due to rounding errors.

Gestational Age Overview

Figure 16 looks at the occurrence of infant and fetal deaths by gestational age. The key findings can be seen below.

- The highest percentage of infant deaths occurred between 21 and 23 weeks after delivery
- The highest percentage of fetal deaths occurred at less than or equal to 20 weeks gestation

Figure 16. Gestational Age Overview Among Cases Reviewed by the AL-FIMR Program, 2019 - 2023†



Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program
† Characteristic totals may not equal 100 percent due to rounding errors.

Prenatal Care Initiation

Prenatal care is important for both the health of the mother and the infant. The AL-FIMR case summary report includes information on the week the mother started their prenatal care. As shown in Table 14, at least **50 percent (n=965/1,703)** initiated prenatal care at 12 weeks or less, while **23.1 percent (n=393/1,703)** experienced delayed prenatal care initiated at 13 weeks or greater and **7.0 percent (n=119/1,703)** received no prenatal care. It should be noted that **13.3 percent (n=226/1,705)** of mothers reviewed had unknown prenatal care.

Table 14 also stratifies by insurance type and race to assess the impact on mothers receiving prenatal care and at what point during gestation prenatal care was initiated. Of those who initiated prenatal care at 12 weeks or less, nearly half **(n=49.0 percent)** had Medicaid insurance. Data revealed racial health disparities as **31.5 percent (n=268/850)** of black mothers received delayed or no prenatal care compared to **24.2 percent (n=177/731)** of white mothers.

Table 14. Prenatal Care Initiation Among Cases Reviewed by the AL-FIMR Program by Insurance and Race, 2019 - 2023†

Maternal Characteristics	≤ 12 Weeks	13-18 Weeks	> 13 Weeks	No Prenatal Care	Unknown Initiation
Insurance					
Medicaid Insurance (n=828)	473 (49.0)	154 (69.3)	131 (76.6)	46 (38.6)	24 (12.8)
Private Insurance (n=535)	447 (46.3)	49 (22.1)	20 (11.7)	7 (5.9)	12 (5.3)
Other (n=49)	19 (2.0)	8 (3.6)	9 (5.2)	10 (8.4)	3 (1.3)
Self-Pay (n=48)	6 (<1.0)	1 (<1.0)	2 (1.2)	39 (32.8)	-
Unknown Insurance (n=243)	20 (2.1)	10 (4.5)	9 (5.3)	17 (14.3)	187 (82.7)
Race					
Black (n=850)	466 (48.3)	126 (56.8)	84 (49.1)	58 (48.7)	116 (51.3)
White (n=731)	463 (48.0)	76 (34.2)	62 (36.3)	39 (32.8)	91 (40.3)
Other (n=116)	36 (3.7)	20 (9.0)	25 (14.6)	22 (18.5)	13 (5.8)
Unknown (n=6)	-	-	-	-	6 (2.7)
Total (n=1,703)	965	222	171	119	226

Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program
† Characteristic totals may not equal 100 percent due to rounding errors.

Close Interval Pregnancy and Birth Spacing

A close interval pregnancy is defined as a pregnancy with less than 18-24 months between delivery and the date of the last menstrual period, signaling the beginning of the next pregnancy. Short intervals between delivery and the next pregnancy have been found to be linked to prematurity, intentional and unintentional injuries, and SUIDs. Looking at Table 15, 728 mothers with an infant death and 148 mothers with a fetal death reported having more than a singular birth. The highest percentage of infant death occurred at 6-11 months, while the highest percentage of fetal deaths occurred at both fewer than 6 months and 12-18 months.

Table 15. Birth Spacing Impact on Infant and Fetal Deaths Among Cases Reviewed by the AL-FIMR Program, 2019 - 2023†

Birth Spacing Characteristics	Count	Percent
Infant Deaths (n=728)		
< 6 Months	119	16.3
6-11 Months	124	17.0
12-18 Months	106	14.6
Fetal Deaths (n=148)		
< 6 Months	19	12.8
6-11 Months	18	12.2
12-18 Months	19	12.8

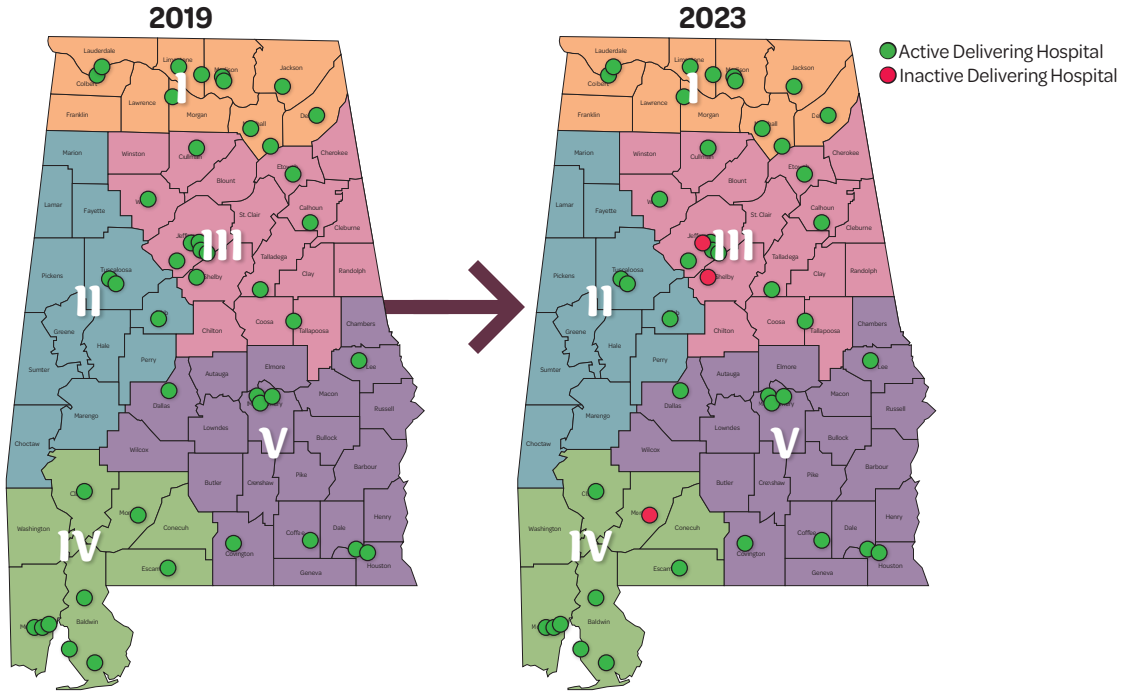
Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program
† Characteristic totals may not equal 100 percent due to rounding errors.

Contributors to Infant and Fetal Mortality

Status of Delivery Hospitals

In 2019, there were 46 active delivering hospitals. Map 6 demonstrates a side-by-side comparison between the active hospitals in 2019 and the active hospitals in 2023. Between 2019 and 2023, three delivering hospitals closed their services. In 2023, one hospital located in rural Marengo County paused its delivering services. With the closure of these hospitals, mothers may have issues receiving the services needed to deliver a healthy baby.

Map 6. Comparison of Active Hospitals, 2019 and 2023



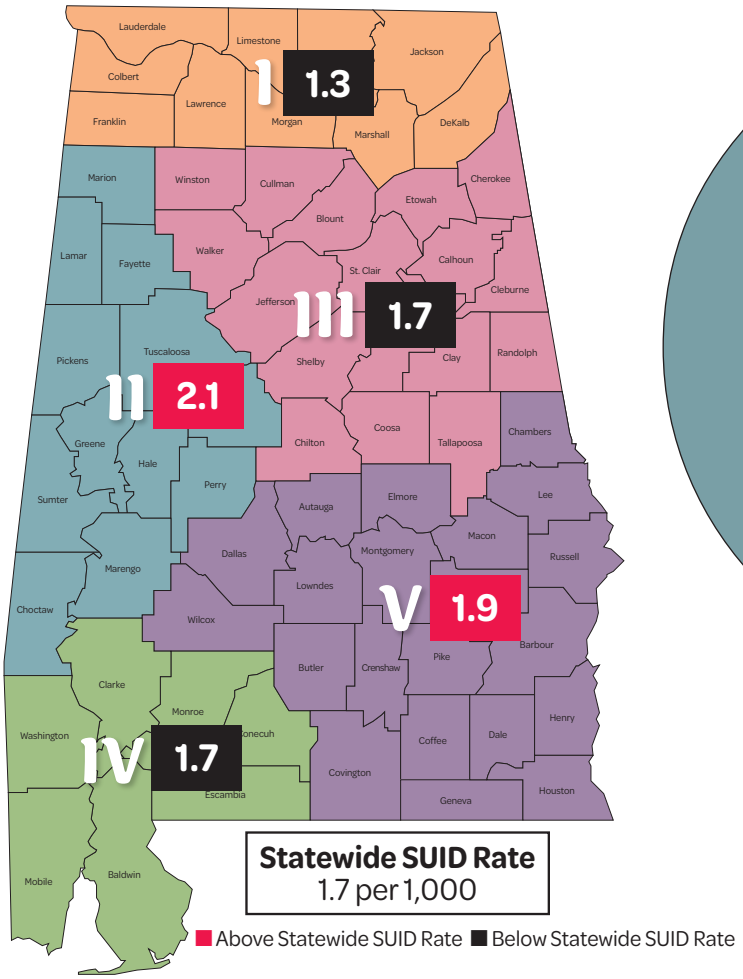
Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program

The AL-FIMR Program regional coordinators included whether or not the mother identified any barriers to transportation in the case summary report. Barriers included being too young to drive, relying on families and friends, and using city buses. After analyzing the completed summary reports, the most notable barrier was relying on family and friends. Approximately **8.5 percent (n=144/1,703)** reported having to rely on family and friends for transportation.

SUIDS

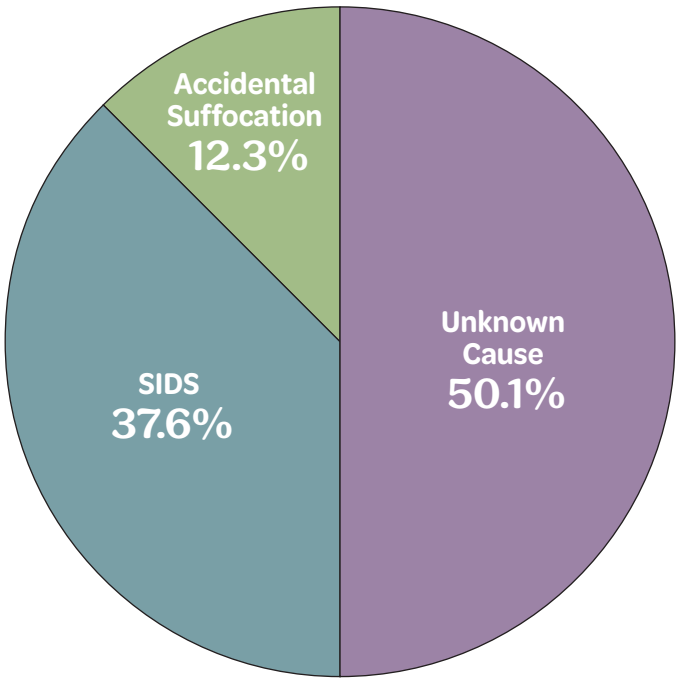
According to the AL-CHS, the total number of SUIDs between 2019 and 2023 was 495. As shown in Map 7, Regions II and V were above the SUID IMR of 1.7 per 1,000 live births. Figure 17 shows the breakdown of SUIDs by type.

Map 7: Alabama SUID Overview by Region, 2019 - 2023†



Source: Alabama Department of Public Health, Center for Health Statistics
† Infant mortality rates per 1,000 live births.

Figure 17. SUID Overview by Type, 2019 - 2023



Source: Alabama Department of Public Health, Center for Health Statistics

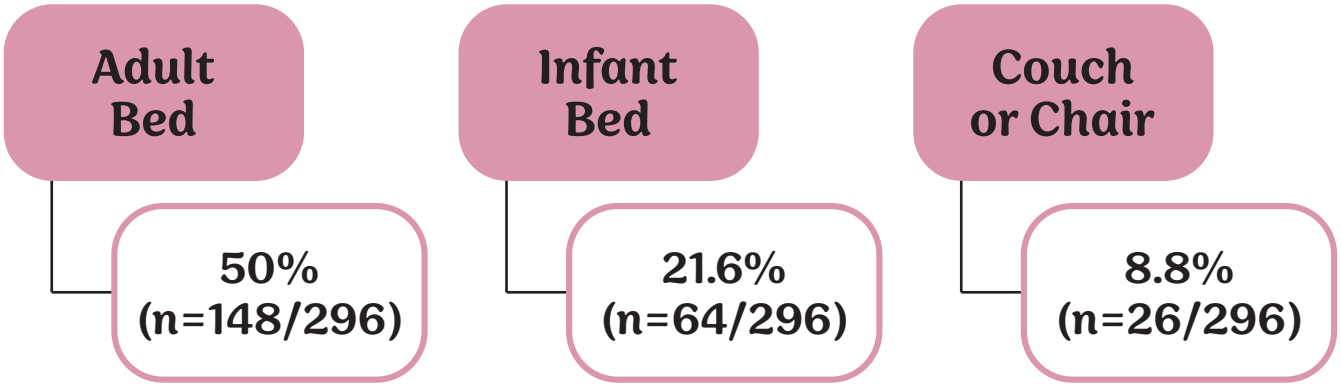
With the completion of the AL-FIMR Program Case Summary Report, the following topics were investigated to better understand what could contribute to SUID.

- Sleeping Location and Bedding at Time of Death
- Sleeping Position at Time of Death
- Items in Sleeping Areas at Time of Death
- Secondhand Smoke

Sleeping Location and Bedding

An infant bed/crib is the recommended sleeping location. Among the case summary reports, **17.4 percent (n=296/1,703)** had a time of death when the baby was found. Figure 18 covers the primary places where the infants slept at the time of their death. Half of the sleep-related deaths occurred in an adult bed.

Figure 18. Sleeping Location at Time of Death Among Cases Reviewed by the AL-FIMR Program, 2019 - 2023



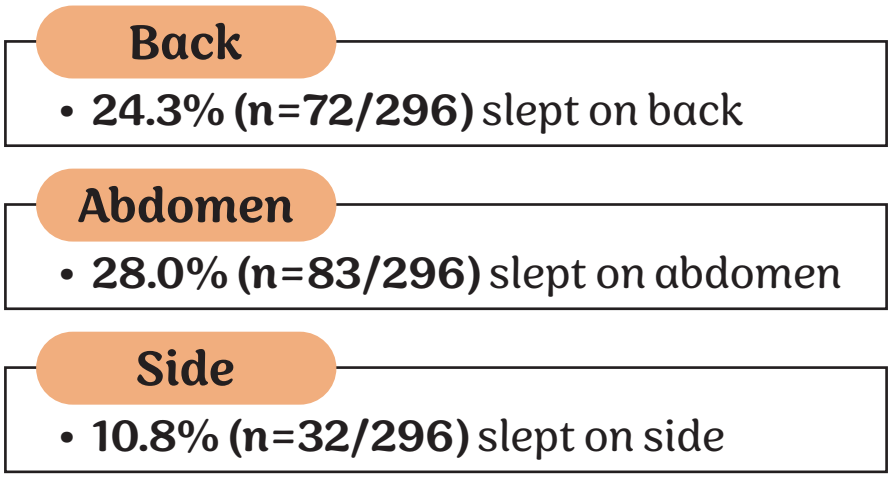
Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program

Of those with a valid sleeping location, firm bedding was reported among **9.8 percent (n=29/296)** at the time of death.

Sleeping Position

Laying the infant on their back is the recommended safe sleep practice. Figure 19 highlights whether the infant slept on their back, abdomen, or side among the infants with a valid sleeping location. Of the three options, the abdomen was selected the most.

Figure 19. Sleeping Position for SUID Related Deaths Among Cases Reviewed by the AL-FIMR Program, 2019 - 2023

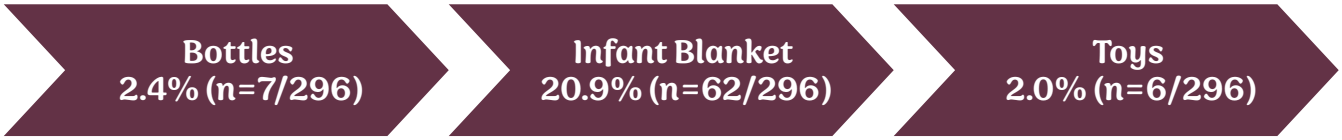


Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program

Items in the Sleeping Area

To ensure a safe sleeping environment, items such as toys, infant blankets, and bottles should be removed from the sleeping area. Figure 20 includes a breakdown of what items were with the baby at the reported time of death.

Figure 20. Sleeping Area Items Among Cases Reviewed by the AL-FIMR Program, 2019 - 2023



Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program

Substance use: Tobacco, Vaping, and Marijuana

The use of tobacco, vapes, and/or marijuana during pregnancy greatly increases the risk of preterm delivery, LBW babies born at term, stillborn, and infant death. Smoking cessation, whether it be tobacco, marijuana, or the use of a vape, is a major lifestyle change a pregnant individual can make to reduce the risk of stillbirth and infant death significantly. According to the AL-FIMR Program, secondhand smoke was reported as a hazard among **16.9 percent (n=50/296)** of those with a reported time that the sleeping death occurred.

Of the SUID related deaths, care coordinators provided tobacco education to **75 percent (n=222/296)** of those with a reported time the sleeping death occurred.

Maternal Health and Risk Factors

Chronic health conditions could impact a mother's ability to give birth to a healthy baby. In the birth certificate, the AL-CHS records any potential maternal health conditions including eclampsia, gestational diabetes, gestational hypertension, overweight, and preterm delivery. According to the AL-CHS, just under **300,000 (n=290,295)** Alabama resident mothers had a delivery between 2019 and 2023. Using the AL-CHS data, Table 14 covers the health conditions that could impact both the health of the mother and the infant during this timeframe. From the results shown, over **60 percent (n=61.4 percent)** of the mothers had a body mass index (BMI) of 25.0 or greater at delivery. Of these, Figure 21 shows how many mothers were either overweight (BMI: 25.0-29.9), obese (BMI: 30.0-39.9), or morbidly obese (BMI ≥ 40) at delivery.

Table 14. Alabama Maternal Health Overview, 2019 - 2023

Maternal Health Characteristics	Count	Percent
Total Alabama Deliveries (N=290,295)		
Overweight (BMI ≥ 25)	178,375	61.4
Preterm	43,763	15.1
Gestational Hypertension	35,297	12.2
Gestational Diabetes	18,418	6.3
Eclampsia	392	<1.0

Source: Alabama Department of Public Health, Center for Health Statistics

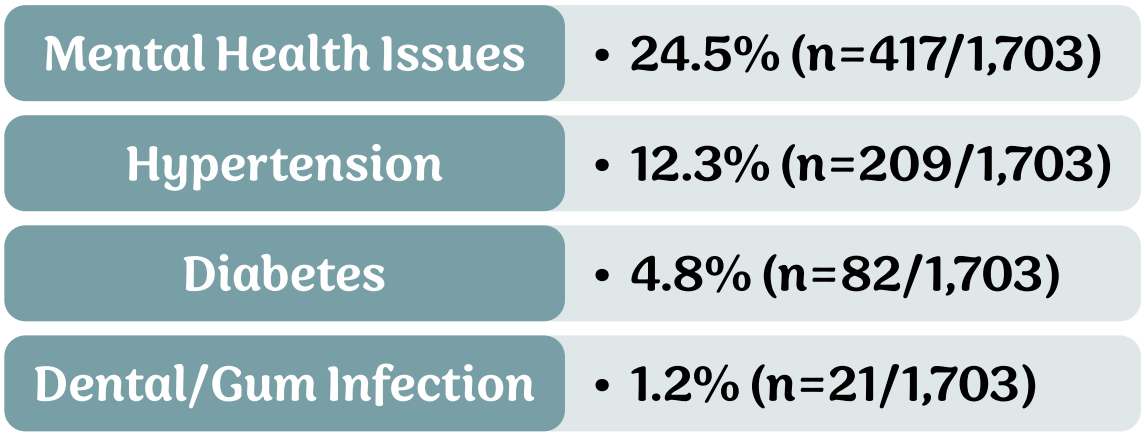
Figure 21. BMI Classification Among Overweight Mothers (n=178,375), 2019 - 2023



Source: Alabama Department of Public Health, Center for Health Statistics
† Characteristic totals may not equal 100 percent due to rounding errors.

After showing the overall health status of the Alabama maternal population, the AL-FIMR Program will now expand further on the overall health of the maternal population. With the AL-FIMR Case Summary Report, Figure 22 demonstrates several health conditions that may not have been captured on the AL-CHS birth certificate.

Figure 22. Maternal Medical History Among Cases Reviewed by the AL-FIMR Program, 2019 - 2023



Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program

Depending on the mother's social environment, the following contributors can worsen the conditions above and increase the risk of having an infant or fetal death.

- Limited Access to Specialty Care
- Intimate Partner Violence
- Lack of Transportation
- Income at or Below Poverty Level

Statewide Initiatives

Between 2019 and 2023, the AL-FIMR Program has worked with the following partners to address the contributors listed in this report to reduce the number of infant and fetal deaths.

Count the Kicks

Count the Kicks is an evidence-based stillbirth prevention program that provides educational resources to healthcare providers and expectant parents about the importance of tracking fetal movement in the third trimester of pregnancy. *Count the Kicks* also has a free app that provides expectant moms a simple, non-invasive way to monitor their baby's well-being every day. The *Count the Kicks* app is available in 12 languages, and its features include a kick-counting history, daily reminders, and the ability to count for single babies and twins. Figure 23 highlights the accomplishments made by the *Count the Kicks*.

Figure 23. 2021-2023 Count the Kicks Findings



Source: Alabama Department of Public Health, Office of Maternal and Child Health

Clear the Crib Challenge

October is Sudden Infant Death Syndrome Awareness Month, and the ADPH continues to promote the ABCs of Safe Sleep—Alone, on their Back, in a Crib.

To help highlight and clarify what a safe, clear crib environment looks like, the ADPH promotes the National Institute of Health's Safe to Sleep® #ClearTheCrib Challenge. This social media challenge is a fun and engaging way to highlight the importance of a clear crib to reduce the risk of suffocation and other SUIDs. All pillows, loose blankets, bumper pads, stuffed animals, and even baby hats should be removed from a crib so that a baby can sleep safely. To successfully "Clear the Crib," participants must remove all unsafe items from a cluttered crib and ensure that the doll representing the baby is safely positioned. This is a timed challenge.

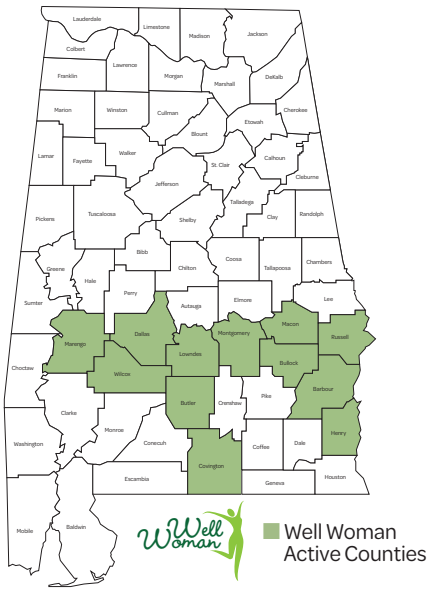
Over the years, colleges, high schools, and individuals have participated in this event. The QR code shows the Clear the Crib Challenge promotion event at Marbury High School.

Well Woman (WW) Program

The program goals for existing WW counties are to increase each participant's understanding of their risk factors for developing cardiovascular disease and/or other chronic diseases such as diabetes, hyperlipidemia, and hypertension; provide education to implement healthy lifestyle changes to prevent disease and promote overall health; and understand preconception, interconception, and postconception health care needs.

As shown in Map 8, the WW Program is currently available in 12 counties as of January 2025. These counties included Barbour, Bullock, Butler, Covington, Dallas, Henry, Lowndes, Macon, Marengo, Montgomery, Russell, and Wilcox.

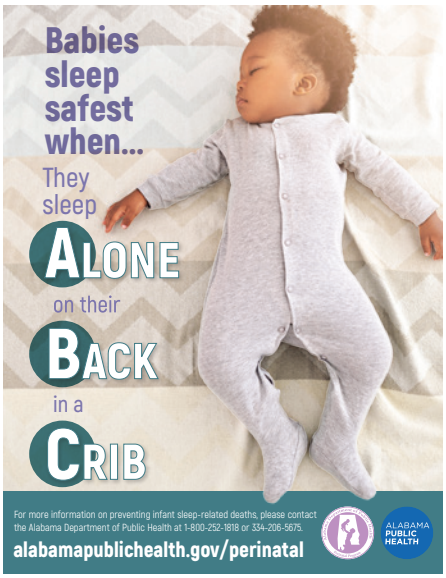
Map 8: WW Active Providers, as of January 2025



Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Well Woman Program

Safe Sleep Initiatives

Figure 24. ABCs of Safe Sleep



WSFA Safe Sleep Featured Segment

Source: Alabama Department of Public Health, Bureau of Family Health Services, Alabama Fetal and Infant Mortality Review Program

Figure 24 highlights the ABCs of Safe Sleep. This is an easy way for everyone to remember the basics of safe sleep practices and help decrease the number of infant-related sleep deaths.

Cribs for Kids® Program

To help reduce the number of SUIDs, the AL-FIMR Program partnered with the National Cribs for Kids® Program to help ensure that all babies have a safe place to sleep. Families in need of a safe place for their baby or infant up to 12 months old to sleep are referred to the program by various care coordinators throughout the state. With the help of the referring care coordinator, each family completes a referral packet that consists of collecting basic caregiver demographics, completing a safe sleep in-service form, and completing the hold harmless agreement. Once the referral has been reviewed and logged by the Safe Sleep Team, the requesting family is shipped a Pack-n-Play to their residence approximately 4 weeks prior to the estimated due date or immediately if the baby has already been born. Each family that receives a pack-n-play is asked to complete two follow-up surveys. The first follow-up survey occurs approximately 2-3 weeks after the baby's estimated due date or 2-3 weeks after the Pack-n-Play was received if the baby was already born when the referral was submitted. The second follow-up survey occurs approximately 6-8 weeks later.

Through various promotional events and billboard advertising, the distribution of Pack-n-Plays has grown significantly across the state. In 2023, the Alabama Cribs for Kids® Program provided 723 Pack-n-Plays to families in need.

Alabama Breastfeeding Committee (ABC)

Breastfeeding has been known to serve as a protective factor against SUID. To reduce SUIDs, the AL-FIMR Program worked with the ABC and Alabama Pregnancy Risk Assessment Monitoring System (AL-PRAMS) Program to increase awareness of the importance of breastfeeding for both the mother and health care professional. The AL-PRAMS Program sends out surveys to ask mothers about their pregnancy journey. In 2023 and moving forward, the following strategies were completed:

- The AL-PRAMS Program completed a PowerPoint presentation highlighting what the AL-PRAMS survey can offer regarding breastfeeding data
- A breastfeeding fact sheet was finalized based on the following 2016-2021 data sources:
  i. The AL-CHS breastfeeding initiation
  ii. The AL-PRAMS mothers' barriers to breastfeeding
  iii. Where did AL-PRAMS mothers receive their breastfeeding information
- This fact sheet was shared with select providers within the counties with the lowest breastfeeding initiation rates
- A QR code has been provided so that mothers and health care professionals will have access to breastfeeding resources

AL-PRAMS Breastfeeding Factsheet

Data Limitations

Ethnicity

The data science team observed that birth certificates may have an unknown Hispanic origin on the birth certificate. Those with unknown Hispanic origin were excluded from the maps presented in this report. Of the cases reviewed by the AL-FIMR Program, close to **30 percent (n=27.8 percent)** were marked unknown.

Case Review

For this time frame, the cases reviewed by the regional team may not have been completed when the data wa extracted for analysis.

Cause of Death

After analysis, the leading causes of death for the case summary reports are consistent with the infant mortality report being published by the AL-CHS. Data validation reports will be performed and sent to the regional coordinators to ensure data accuracy.

Police Reports

After data analysis, the data science team observed missing fields in the sleep-related death section of the case summary report. The AL-FIMR Program aims to train police officers on the importance of filling out every field. In addition, the transition to the National Fatality Review – Case Reporting System and the implementation of a data validation tool should reduce the number of missing fields.

Gestation

After data analysis, the data science team observed that some of the case summary reports had a mismatch in gestational age in weeks. This was excluded from the analysis.

References

[1] **Linked Birth/Infant Death Records, 2007-2022**
https://wonder.cdc.gov/lbd-current.html

[2] **Fetal Deaths, 2005-2022**
https://wonder.cdc.gov/fetal-deaths-current.html