Mississippi Infant Mortality Report 2021

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NOTE: Data included in this report are current as of ***10/1/2023***

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ACKNOWLEDGMENTS

The Mississippi State Department of Health acknowledges the families touched by infant death each year. This report is generated with the goal of preventing these tragic losses. Data for this report are made available by the Office of Vital Records & Public Health Statistics and the Office of Women's Health, Maternal and Infant Health Bureau.

Contributors:

Vernesia Wilson, PhD, MPH
Director & Epidemiologist, Maternal and Infant Health Bureau

Krista Guynes, MSW, LCSW
Director, Office of Women's Health

Joseph Miller, MS, MPH
Director, Office of Vital Records and Public Health Statistics

For more information, contact Dr. Vernesia Wilson, Director and Epidemiologist, Maternal and Infant Health Bureau at Vernesia.Wilson@msdh.ms.gov. To explore or request data, please check the Mississippi STatistically Automated Health Resource System (MSTAHRS) or use the Public Records Request online form at Public Records Requests - Mississippi State Department of Health (ms.gov)).

EXECUTIVE SUMMARY

Infant mortality is the death of an infant within his or her first year of life. The infant mortality rate is a measure of the number of infant deaths for every 1,000 live births. This measure is a marker of and helps understand the overall quality of the health of a population. Infant mortality also can help identify factors that contribute to death, gaps in health care, and barriers to care access. This report describes the infant mortality rate, highlights morbidities, and characteristics of Mississippi resident infant deaths which occurred in 2021. Ten year trend analyses are also included to provide a historical view of infant mortality in Mississippi.

Key Findings

- In 2021, there were 327 infant deaths and 35,166 live births to Mississippi residents. The infant mortality rate for this year was 9.3 infant deaths per 1,000 live births.
- The top three leading causes of infant deaths in 2021 included:
    - disorders related to short gestation and low birth weights,
    - congenital/chromosomal abnormalities and major structural birth defects, and
    - sudden unexplained infant death / sudden infant death syndrome.
- In 2021, 128 (39%) of the 327 infant deaths were among Whites; 185 (57%) were among Black infants; and 14 (4%) were among Other Races.
    - The infant mortality rate for Whites was 6.6 per 1,000 live births; for Blacks it was 12.6 per 1,000 live births.
- In 2021, short gestation/prematurity and low birth weight attributed to 16% of infant deaths.

Key Recommendations (State Health Plan, Mississippi)

- Incorporate strategies to decrease the number of preterm and low birthweight infants
- Increase the number of pregnant women who enter prenatal care during the first trimester
- Implement healthy initiatives to assist pregnant women who are high risk including those in the following categories:
    - Pre-existing health conditions (e.g. high blood pressure, diabetes, heart

or blood disorders, renal conditions, thyroid conditions, asthma, autoimmune diseases, epilepsy, obesity, sexually transmitted infections, stress, depression, anxiety, etc.)
    - Advanced maternal age
    - Unhealthy lifestyle factors (e.g. substance use/abuse including alcohol and tobacco)
    - Short interpregnancy intervals (i.e. pregnancy spacing)
    - Conditions during pregnancy (e.g. multiple gestation, preeclampsia and eclampsia, gestational diabetes, previous preterm birth, birth defects or genetic conditions of fetus)
- Increase overall perinatal health for women in the state

INTRODUCTION AND BACKGROUND

The Mississippi State Department of Health (MSDH) is committed to decreasing infant morbidity and mortality in the state. Because the infant mortality rate (IMR) is an important indicator of the overall health of a population, it is imperative that efforts are made to eliminate factors contributing to high rates. In the United States, the leading causes of infant mortality include birth defects, preterm birth, low birthweight, complications with maternal pregnancy, sudden infant death syndrome, and injuries (CDC, 2021). These are comparably the major causes of infant deaths in Mississippi as well.

By definition, infant mortality represents the deaths of infants under one year of age. Infant mortality is linked to important social determinants of health and has an apparent association between its causes and other factors that are likely to influence the health status of whole populations including their economic development, general living conditions, social wellbeing, rates of illness, and the quality of the environment (Reidpath & Allotey, 2003). Systemic and historical experiences of racism, inequities in health care access and the quality of health care, discrimination and population differences in social determinants of health all contribute to the vast disparities observed in infant mortality. Infant health and well-being also reflect the quality, safety, accessibility, and equity within the state's healthcare system and the capacity to provide risk-appropriate care to both pregnant women and newborns.

Geographic and racial disparities in infant mortality in Mississippi are significant. In Mississippi, the rate of infant mortality among non-Hispanic Black infants was twice that of non-Hispanic White infants. Mississippi's race specific IMRs have changed very little over the past decade. In 2012, while the overall IMR was 8.9 per 1,000 live births, racial disparities in infant mortality were evident. During that year, the IMR among Black infants was 12.4 deaths per 1,000 live births compared to 5.4 deaths per 1,000 live births for White infants. Data from 2021 indicate disparities are also evident. The IMR for Black infants in 2021 was 12.6 per 1,000 live births compared to 6.6 per 1,000 live births for White infants.

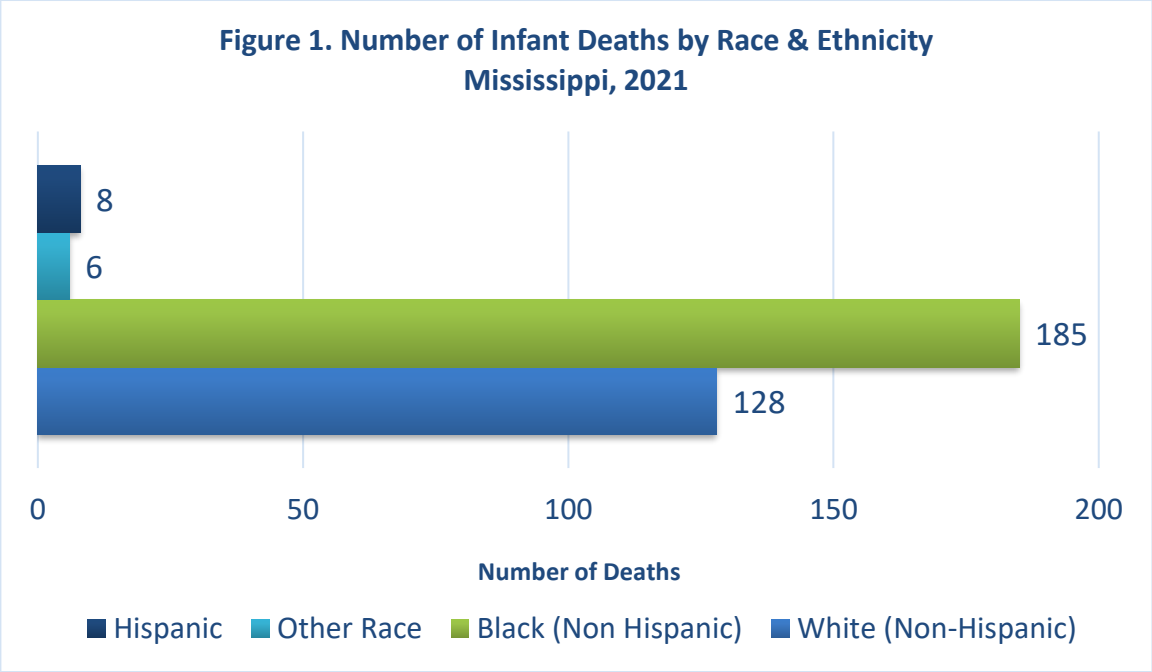
Geographic differences also exist for the state's IMR. Over the past decade (2012-2021), Public Health District III (Delta Hills Region) has consistently had the highest IMRs in the state. The rates have ranged from 11.9 deaths per 1,000 live births in 2012 to 13.7 deaths per 1,000 live births in 2021. The disparity rates for the district ranged from 5.2 per 1,000 live births to 8.5 per 1,000 for Whites in 2012 and 2021 respectively, compared to 13.9 to 15.5 infant deaths per 1,000 live births for Blacks during the same time span. It is evident to note that there were less than five White infant deaths for eight of the years during the ten-year time span.

The Healthy People 2030 goal is to *Reduce the rate of infant deaths (MICH-02)*. This report includes the data, disparities, and pattern of infant mortality in Mississippi. It also delineates contributing factors and outlines a work plan for reducing the infant mortality rate in the state.

DATA REPORTS

Deaths and Births, Mississippi 2021

In 2021, there were 327 infant deaths and 35,166 live births to Mississippi resident women. Figure 1 indicates the distribution of the number of infant deaths by race during that year.

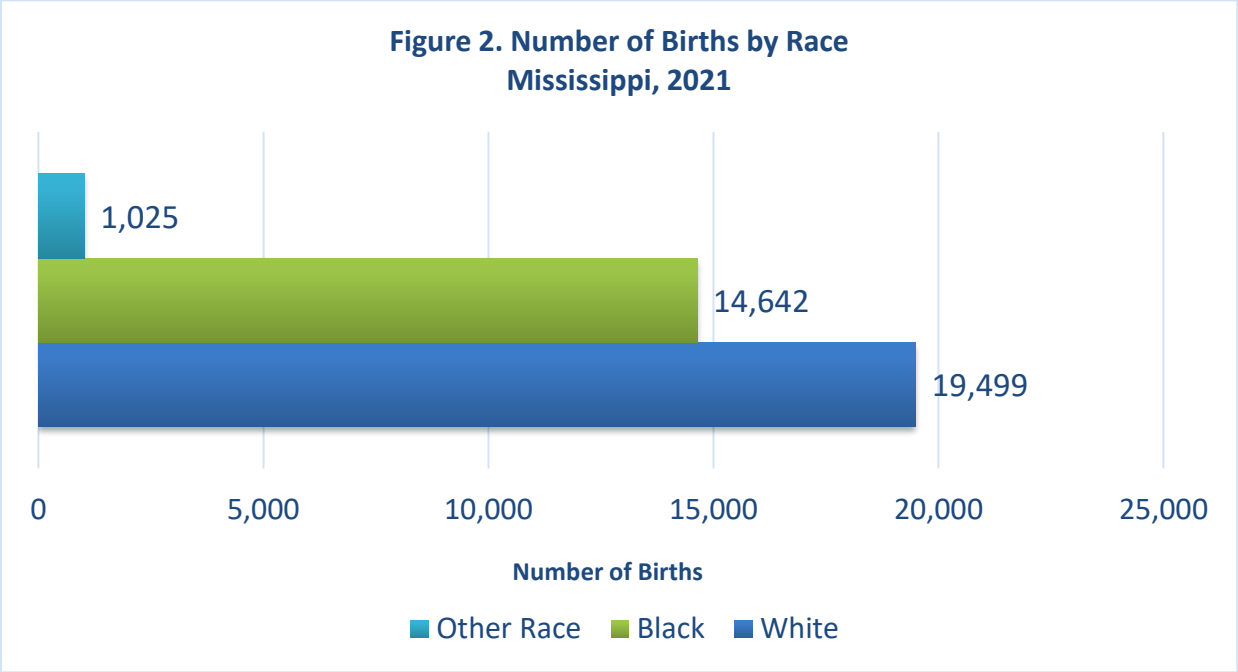


Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2021

Notable in 2021, deaths and births by race and ethnicity were as follows:

- Hispanic infants accounted for 8 (2%) deaths;
- Non-Hispanic Black (referred to as "Black" throughout this report) infants accounted for 185 (57%) deaths and 14,642 (42%) births;
- Non-Hispanic White (referred to as "White" throughout this report) infants accounted for 128 (39%) deaths and 14,642 (42%) births; and
- Infants of other races and other / unknown ethnicities accounted for 6 (<2%) deaths and 1,025 (2.9%) births.

In 2021, there were 35,166 births as indicated in Figure 2. The births are distributed by race in the graph.



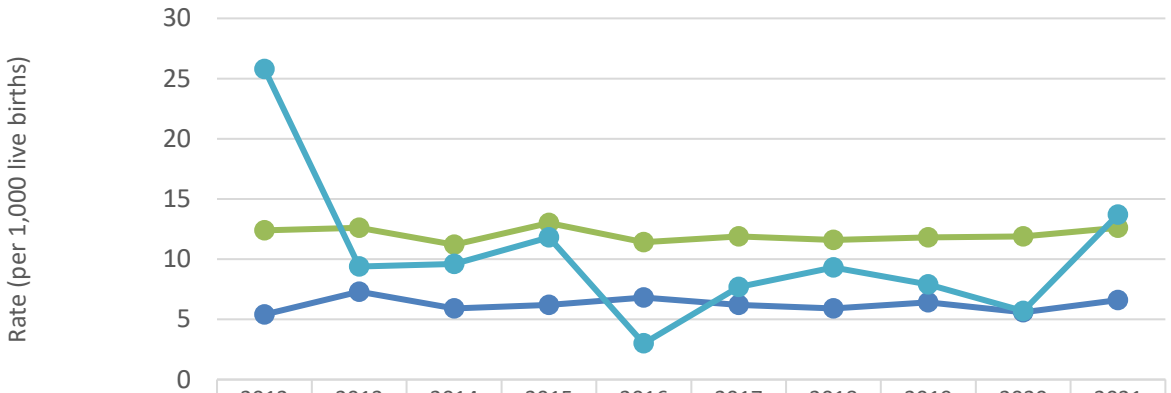
Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2021

Trends in Infant Mortality

The state's current (2021) IMR is more than four points above the HP2030 target of no more than 5 infant deaths per 1,000 live births. The infant mortality rate for the state has indicated fluctuation during the past decade with an average rate of 8.8 deaths per 1,000 live births for the ten-year period.

Figure 3 indicates the trend of the state's IMR by race for the past decade (2012-2021).

Figure 3. Infant Mortality Rate Trends by Race
Mississippi, 2012-2021



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
White	5.4	7.3	5.9	6.2	6.8	6.2	5.9	6.4	5.6	6.6
Black	12.4	12.6	11.2	13	11.4	11.9	11.6	11.8	11.9	12.6
**Other Race	25.8	9.4	9.6	11.8	3	7.7	9.3	7.9	5.7	13.7

White Black **Other Race

Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2012-2021
**Some rates for the Other Race category represent values calculated at less than 20 events

Geographic Disparities. Mississippi has geographic disparities in infant mortality. As indicated in the table (Table 1), racial disparities existed in 2021 for each of the Public Health Districts. Black infants have continuously had higher infant mortality rates compared to Whites in the state. *Note: Rates containing less than 20 events/cases will usually have higher IMRs.*

Table 1. Mississippi IMR by Public Health District, 2021 (per 1,000 live births)

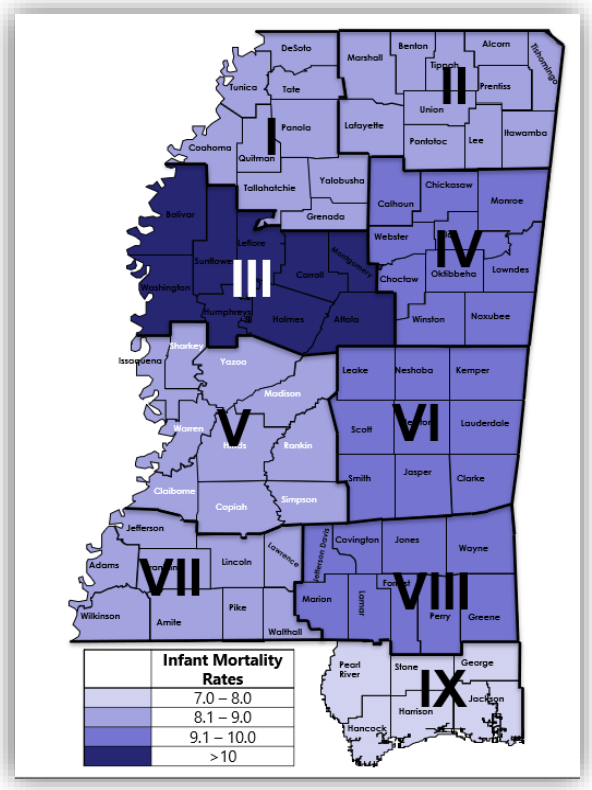
Public Health District	Black IMR Rate	White IMR Rate	Other Race IMR Rate
1	11.3	8.3	0.0
2	10.5	6.2	25.6
3	15.5	8.5	0.0
4	12.9	6.0	15.4
5	11.9	5.8	24.2
6	11.0	8.6	20.2
7	11.4	8.8	66.7
8	17.7	8.8	11.9

Public Health District	Black IMR Rate	White IMR Rate	Other Race IMR Rate
9	11.2	4.0	0.0

Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2021

Figure 4 indicates the state's ten-year IMR average by public health district. As depicted in Figure 4, areas of the state with some of the most challenging resource needs often have the highest rates of infant morbidity and mortality.

Figure 4. Infant Mortality Rates (per 1,000 live births), 10-Year Averages by Mississippi Public Health District, 2012-2021

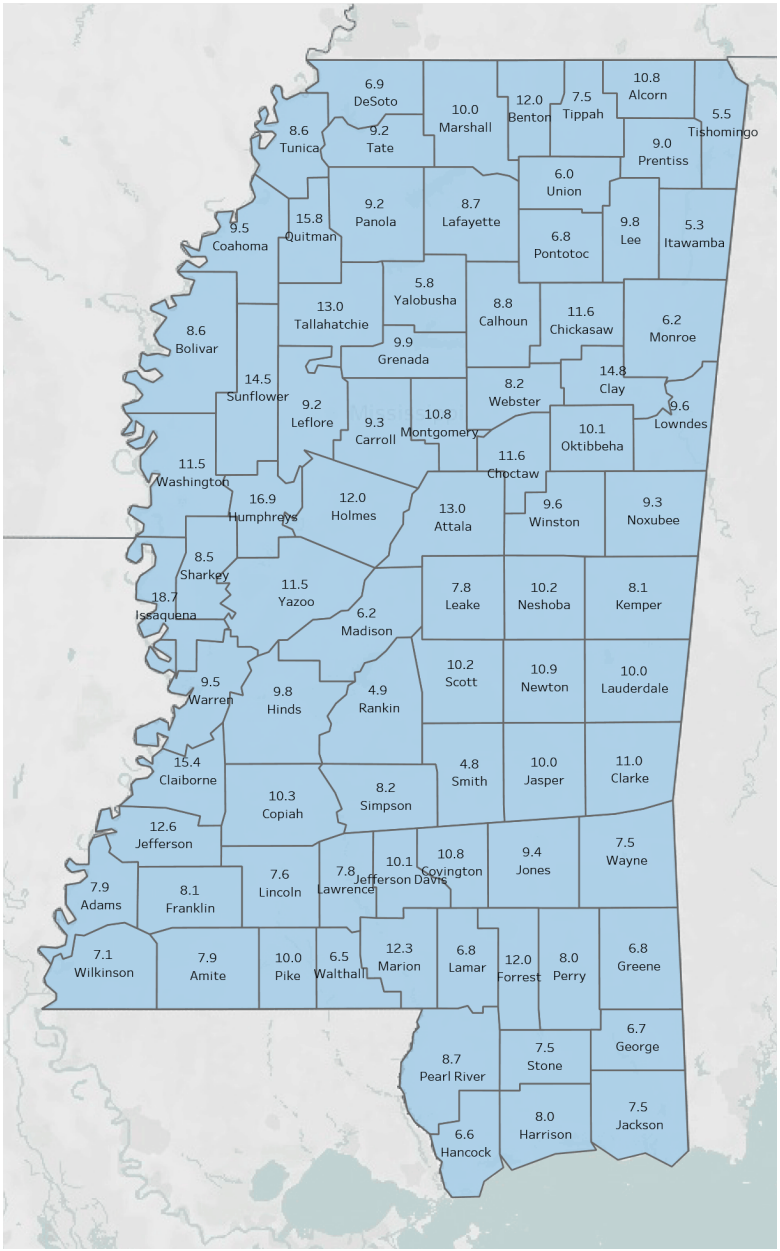


PH District	10-Year Avg IMR
I	8.2
II	8.6
III	11.2
IV	9.7
V	8.2
VI	9.6
VII	8.4
VIII	9.6
IX	7.8

Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2021

In addition to disparities by public health district, 10-year county-level rates also indicate geographic disparities. As indicated in Figure 5, over the ten-year period, Issaquena, Humphreys, and Quitman counties had the highest infant mortality rates per 1,000 live births. However, it is crucial to note that Issaquena County had less than five infant deaths during the ten-year period. Because the population in the county is low, the rate is higher based on calculations used for determining infant mortality rates.

Figure 5. Ten-Year Average IMR by County, Mississippi, 2012-2021 (per 1,000 live births)

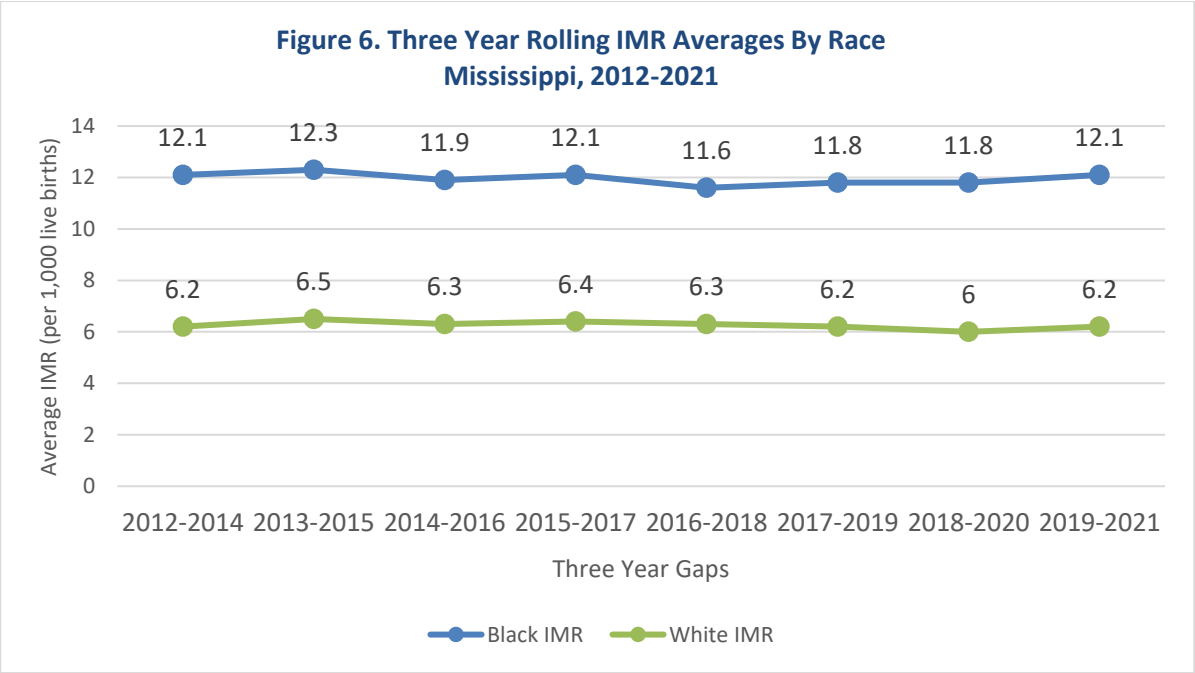


Source: Mississippi Statistically Automated Health Resource System (MSTAHRS)

Racial Disparities. In 2021, while the overall IMR for the state was 9.3 per 1,000 live births, racial disparities in infant mortality were evident. Within a year, from 2020 to 2021, the IMR among Black infants indicated an increase from 11.9 deaths per 1,000 live births to the current rate of 12.6 deaths per 1,000 live births. There was also an increase among White infant deaths from 5.6 deaths per 1,000 live births in 2020, to 6.6 deaths per 1,000 live births in 2021.

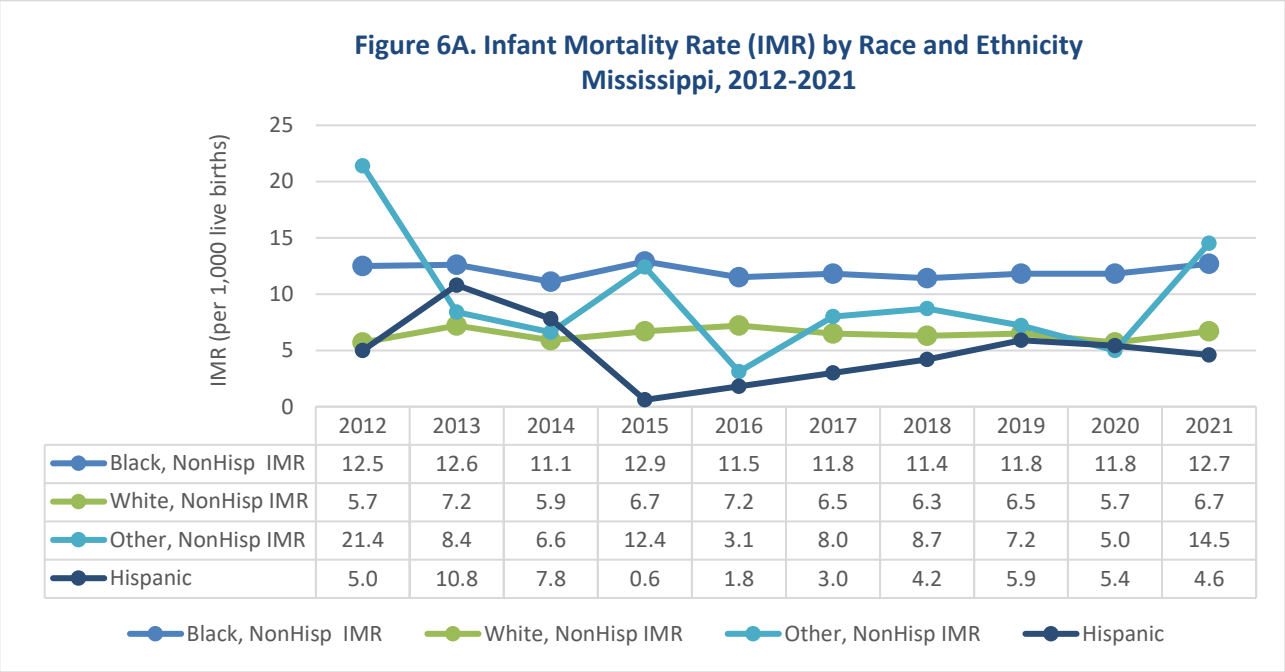
The United States IMR in 2021 was 5.4 deaths per 1,000 live births. Similarly, to Mississippi, the national rate for non-Hispanic Black infants was higher at 10.6 deaths per 1,000 live births compared to 4.4 deaths per 1,000 live births for Non-Hispanic White infants (CDC, 2023).

In Mississippi, the three-year average rolling disparity or gap between the IMR of Black and White infants narrowed between the years of 2016-2018 and 2018-2020, but only slightly. Overall, the Black - White IMR gap has changed very little in the past decade (Figure 6).



Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2012-2021

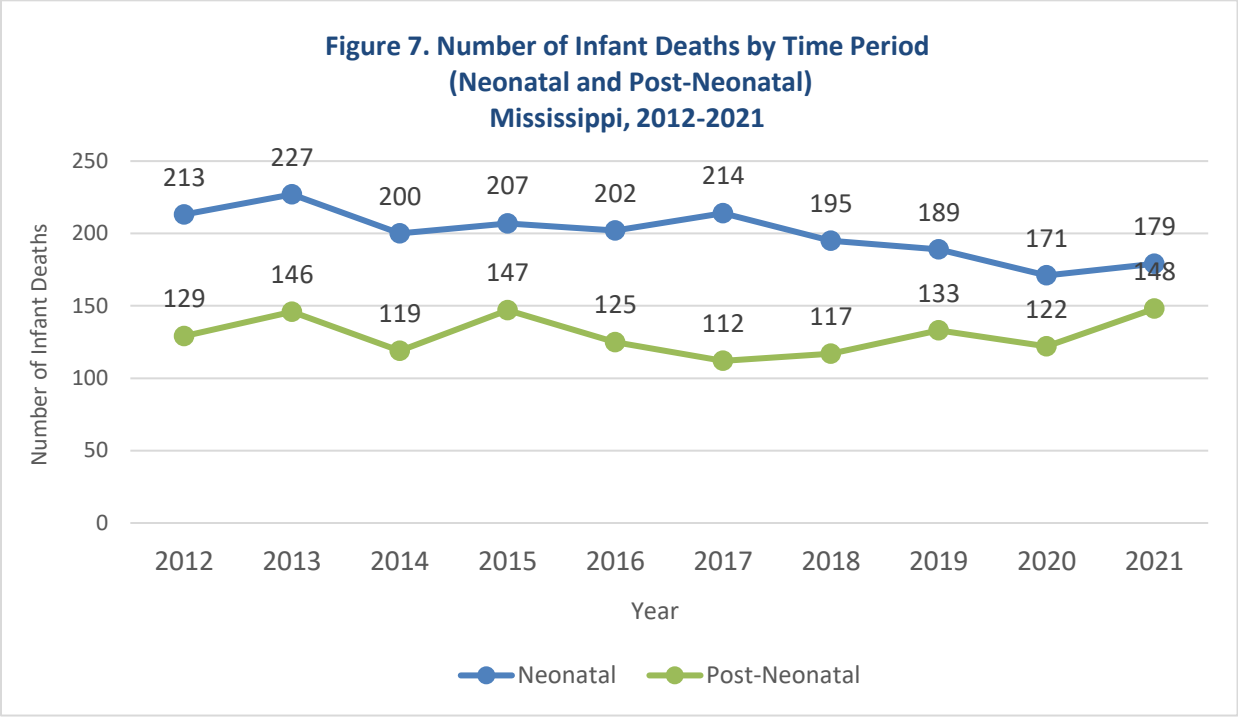
As indicated in Figure 6A below, the rates (per 1,000 live births) of infant deaths by race and ethnicity have consistently been higher among Black Non-Hispanics and Other Non-Hispanic races. The highest rates for both of these groups were reported in 2015 for Non-Hispanic Blacks and 2021 for Other Non-Hispanic races.



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Black, NonHisp IMR	12.5	12.6	11.1	12.9	11.5	11.8	11.4	11.8	11.8	12.7
White, NonHisp IMR	5.7	7.2	5.9	6.7	7.2	6.5	6.3	6.5	5.7	6.7
Other, NonHisp IMR	21.4	8.4	6.6	12.4	3.1	8.0	8.7	7.2	5.0	14.5
Hispanic	5.0	10.8	7.8	0.6	1.8	3.0	4.2	5.9	5.4	4.6

Source: Mississippi Department of Health, Office of Vital Records and Public Health Statistics, 2023

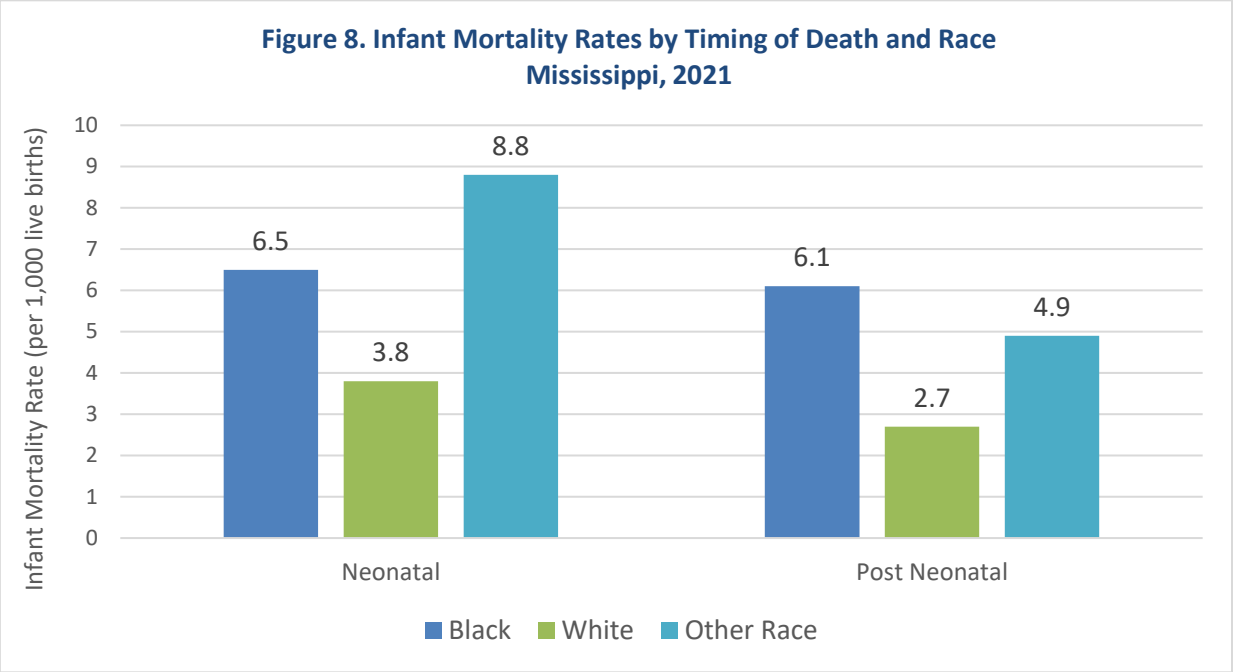
Timing of Death. Infant death can also be examined by the time period after birth when death occurs. Deaths can be divided into two critical periods: the neonatal period (between birth and 27 days of life); and the post-neonatal period (between 28 and 364 days of life). Over the past decade, the number of deaths in the neonatal period have been greater than the number of deaths in the post-neonatal period (Figure 7).



Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2012-2021

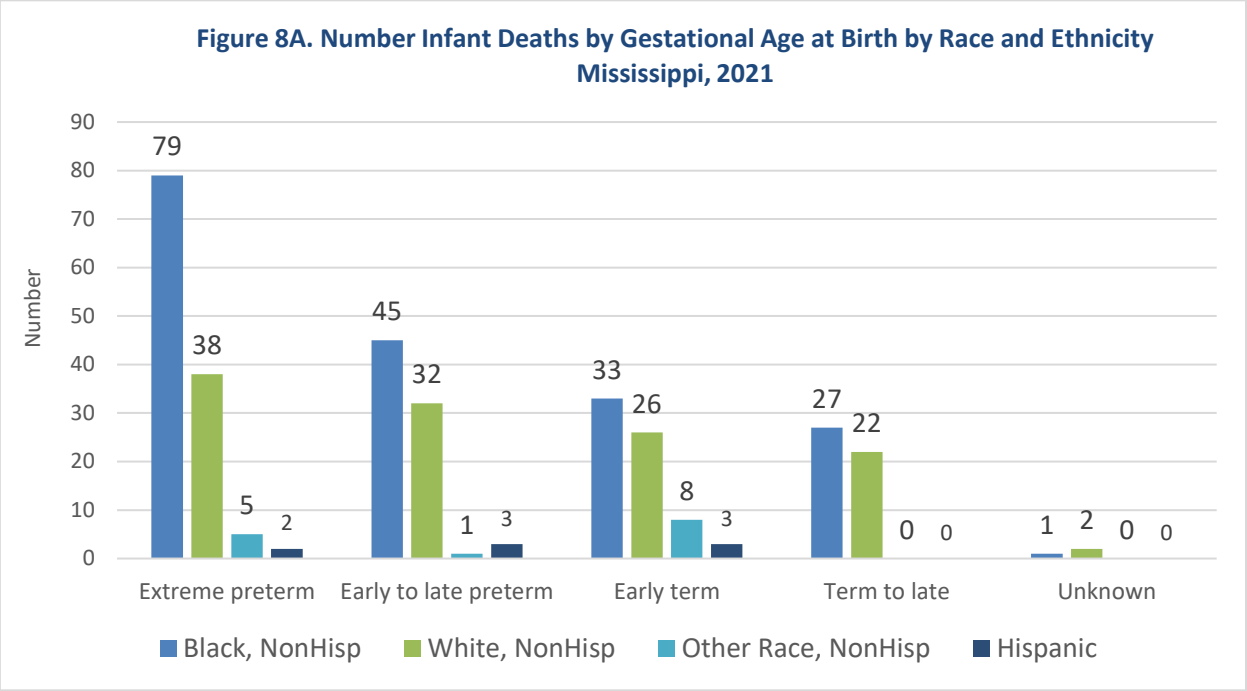
In 2021, the Mississippi neonatal and post-neonatal mortality rates were 5.1 and 4.2 deaths per 1,000 live births, respectively. In comparison to the 2020 Mississippi neonatal and post-neonatal mortality rates, the neonatal rate decreased from 4.8 deaths per 1,000 live births; however, the post-neonatal rate increased from 3.4 deaths per 1,000 live births in 2020.

The racial disparity in 2021 for timing of death is evident for Black infants. As indicated in Figure 8, infant death rates that happened within the two periods were higher for Black infants than White infants.



Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2021

Timing of death may also be categorized into four different groups at birth: (1) extreme preterm, (2) early to late preterm, (3) early term, and (4) term to late. Extreme preterm infant deaths occur during 27 weeks or earlier gestational periods. Early to late preterm deaths occur during 28-36 weeks gestation. Early term deaths occur 37-38 weeks gestation and term to late term deaths occur during 39+ weeks gestation at birth. Further analyses of timing of death in 2021 (Figure 8A) indicate that the majority of infant deaths occurred during the extreme preterm (27 weeks or earlier) gestational period at birth.



Source: Mississippi Department of Health, Office of Vital Records and Public Health Statistics, 2023

Racial Disparities in Timing of Death. Racial disparities in timing of death also are common in Mississippi. During the past decade (2012-2021), neonatal mortality rates among Black infants were consistently higher than all other rates. (Table 2) Notably, the neonatal rate for Black infants decreased from 2012 to 2021, whereas the same rate for White infants slightly increased. The post-neonatal death rate increased for both Black and White infants from 2012 to 2021.

Table 2. Neonatal and Post-Neonatal Mortality Rates by Race, Mississippi 2012-2021 (deaths per 1,000 live births)

Mortality Period	Race	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Neonatal	Black	7.9	7.9	7.4	7.4	7.5	8.3	7.4	6.9	6.7	6.5
	White	3.2	4.4	3.5	3.7	3.8	3.8	3.7	3.8	3.3	3.8
Post-Neonatal	Black	4.6	4.7	3.8	5.6	3.9	3.6	4.2	4.9	5.1	6.1
	White	2.2	3.0	2.4	2.5	3.0	2.4	2.3	2.7	2.2	2.7

Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2021

Leading Causes of and Disparities in Infant Death in 2021

In 2021, there were 327 infant deaths, which resulted in a statewide IMR of 9.3

deaths per 1,000 live births. Table 3 indicates the causes of deaths by number, percent, and rate. Almost half of infant deaths (49%) were attributed to prematurity/low birth weight, congenital conditions/birth defects, and Sudden Infant Death Syndrome (SIDS).

Table 3. Infant Deaths by Cause of Deaths, Mississippi 2021

Cause of Death	Number	Percent	Rate (Per 1,000 live births)
Disorders related to short gestation and low birth weight, N.O.S.	54	16.5%	1.5
Congenital malformation, birth defects/deformations, and chromosomal abnormalities	54	16.5%	1.5
Sudden Infant Death Syndrome	51	15.6%	1.5
Bacterial sepsis of newborn	7	2.1%	0.2
Respiratory distress of newborn	<5	***	0.1
Accidents	29	8.9%	0.8
Newborn affected by maternal complications of pregnancy	8	2.4%	0.2
Influenza and Pneumonia	<5	***	0.1
Other causes	207	63.3%	3.4
TOTALS	**327**	**100%**	**9.3**

Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2021

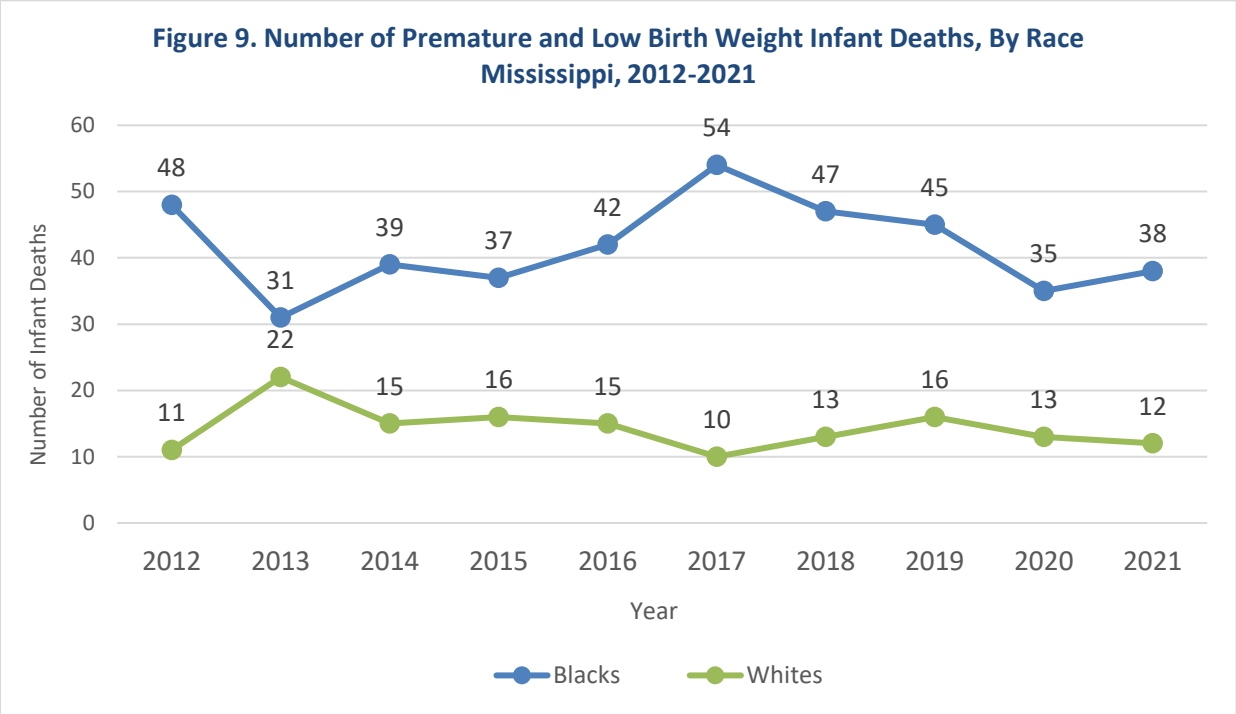
As indicated in Table 3, the top three leading causes of infant deaths in Mississippi were due to (1) prematurity, short gestation/low birth weight; (2) congenital malformations/birth defects and (3) sudden infant death syndrome. Data and disparities for each of the three leading causes are detailed in the subsections below:

Prematurity. Premature or preterm birth is when an infant is born too early, before 37 weeks of pregnancy has been completed. The earlier an infant is born, the higher the risk of death or serious disability. Infants who are born before 37 weeks of gestation are at an increased risk of breathing complications, infections, brain injury and death. In 2021, preterm birth affected about 1 of every 10 infants born in the United States, which is a 4% increased from 2020 (CDC, 2022). Data from the National Center for Health Statistics (2022) indicates that Mississippi's

preterm birth percentage in 2021 was 14.96% which is the highest in the nation.

Low Birthweight (LBW). In 2021, 12.35% of babies born in Mississippi weighed less than 2,500 grams or 5 lbs. 8 oz (National Center for Health Statistics, 2023). All newborns are weighed at birth and weight is classified into several categories: normal (2,500 grams or 5.5 pounds, or more); low birthweight (below 2,500 grams or 5.5 pounds); very low birthweight (below 1,500 grams or 3.3 pounds); and extremely low birthweight (below 1,000 grams or 2.2 pounds). Smaller than normal weight of a newborn at birth also presents additional health risks. These risks due to small weights can be difficult to distinguish from the health risks associated with prematurity. While most newborns with a very low birthweight (VLBW) are also premature, infants born weighing less than 1500 grams (3.3 pounds) often have little body fat and may have trouble staying warm, trouble feeding and gaining weight, be prone to developing infection and serious digestive problems, and are at greater risk for Sudden Unexpected Infant Death (SUID).

Figure 9 represents the number of infant deaths in Mississippi due to disorders related to short gestation (prematurity) and low birth weight by race from 2012-2021. As indicated in Figure 9, vast disparities exist among Black and White infants who died from prematurity and low birth weight.



Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2012-2021

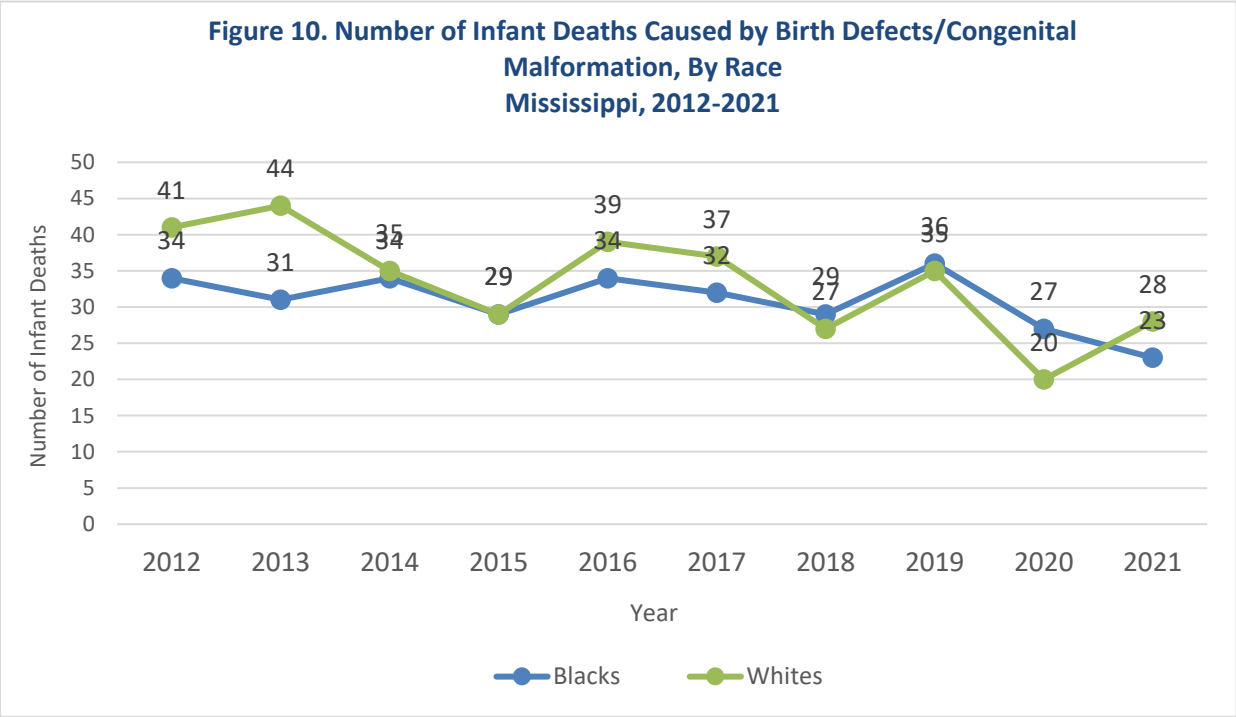
In Mississippi, the majority of infant deaths occurred among those who are born at a very low birth weight or VLBW (less than 1500 grams) in 2021. Even though the overall infant mortality rate by gestational weight was higher among VLBW infants in Other Non-Hispanic Races in 2021, the highest actual number of these deaths occurred among Non-Hispanic Blacks (Table 4).

Table 4. Number and Rate (per 1,000 live births) of Infant Deaths in Mississippi by Gestational Weight at Birth, 2021

Weight Category	All Races		Black, NonHis		White, NonHis		Other Race NonHisp		Hispanic	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
VLBW	147	201.1	93	191.0	47	218.6	5	454.5	2	111.1
LBW	71	19.6	36	17.2	28	21.0	5	60.2	2	19.6
Normal	107	3.5	56	4.7	43	2.6	4	4.6	4	2.4
Unknown	2	2000.0	0	0.0	2	2000.0	0	0.0	0	0.0

Source: Mississippi Department of Health, Office of Vital Records and Public Health Statistics, 2023
**Note: Counts and corresponding rates for an event size of less than 20 should be interpreted with caution

Birth Defects. Major structural birth defects are defined as conditions that (1) are present at birth, (2) result from a malformation or disruption in one or more parts of the body, and (3) have a serious adverse effect on health, development, or functional ability. Some birth defects are related to genetic abnormalities. There has been a drastic decrease from 2012 to 2021 in the number of infants dying from birth defects/congenital malformations, with the lowest numbers represented in years 2020 and 2021 (Figure 10). A comprehensive description of birth defects may be found here: Reports - Mississippi State Department of Health (ms.gov).



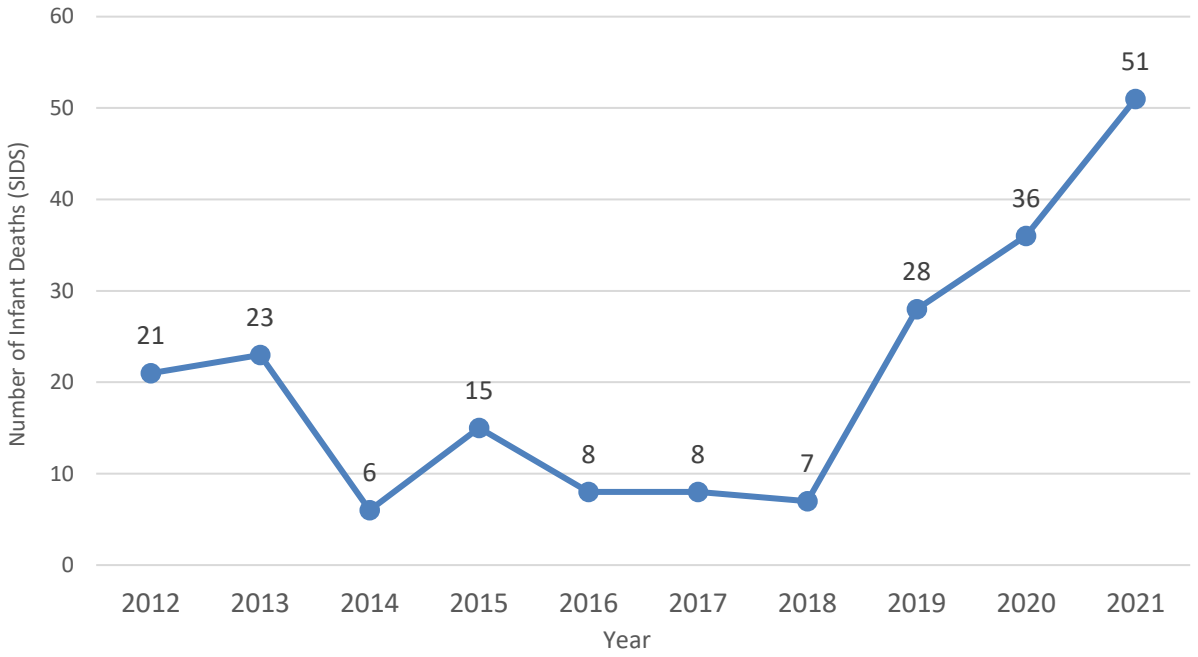
Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2012-2021

Sudden Unexpected Infant Death. Sudden Unexpected Infant Death (SUID) is a term that englobes the sudden and unexpected death of an infant less than 12 months of age, which cannot be explained by organic or traumatic causes, or that can't be explained such as cases of Sudden Infant Death Syndrome, also known as SIDS (Konstat-Korzenny et al., 2019). Most SUID cases in Mississippi occur when the newborn is placed in an unsafe sleep environment or the sleep environment becomes unsafe and causes suffocation, strangulation or an overlay accident to occur (these types of deaths are often referred to as accidental suffocation or strangulation in bed). Sudden Infant Death Syndrome (SIDS) is a form of SUID

where no cause is identified but is affected by sleeping position and environment.

According to the Centers for Disease Control and Prevention (2023), each year there are about 3,400 SUIDs with the three commonly reported types being SIDS, unknown causes, and accidental suffocation and strangulation in bed. SUID-related deaths are disproportionately high in Mississippi compared to most states. As indicated in Figure 11, over the past decade, Mississippi had the highest number of SIDS deaths in 2021 compared to the previous nine years.
Over the past ten years, there have been a total of 203 SIDS cases in Mississippi. Of this number, 75 SIDS cases were among White infants, 124 among Black infants, and 4 SIDS deaths for Other Races.

Figure 11. Number of SIDS Cases by Year
Mississippi, 2012-2021



Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2012-2021

INFANT MORBIDITY, MISSISSIPPI

Infant Morbidity may be defined as any condition that adversely impacts the ability of newborns to survive and thrive. In many cases morbidities lead to mortalities; however, there are some that may be prevented. Because several factors may contribute to infant mortality, it is imperative to consider the precursors that potentially lead to death as an unfortunate conclusion. These factors may include, but are not limited to preconception health and care, pre-existing chronic conditions, prenatal care, and/or overall unhealthy behaviors.

Preconception Care

Preconception care is defined as a set of interventions that are to be provided before pregnancy, to promote the health and well-being of women and couples, as well as to improve the pregnancy and child-health outcomes (World Health Organization, 2013). Preconception care may also involve "interconception care" which is used when referring specifically to care provided between pregnancies. This type of care includes interventions that modify risk factors in order to promote healthy outcomes of subsequent pregnancies (Yonekura, et al, 2009).

Some maternal conditions are known to be associated with birth defects and are usually common chronic conditions that contribute to poor overall health in women—before, during and after pregnancy. These include, but are not limited to genetics, socioeconomics and demographics, environmental factors including infections, and unknown causes (World Health Organization, 2023).

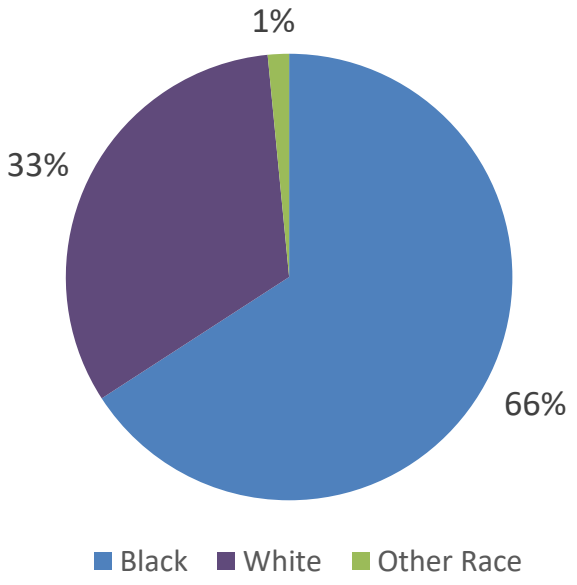
Pre-Existing Chronic Health Conditions [Maternal]

Pre-existing chronic health conditions in pregnant women are cause for concern due to the high-risk nature of these conditions. Pre-existing chronic health conditions heavily manifest during pregnancy and can cause adverse health outcomes not only for the mother, but as well as the infant in which she is carrying. Some pre-existing conditions in maternal patients that are detrimental and cause for concern include, but are not limited to hypertension, diabetes, and obesity. These conditions are further explained below:

Hypertension (High Blood Pressure). Preeclampsia and complications from chronic hypertension are leading drivers of maternal morbidity, mortality and preterm birth. Hypertensive disorders in pregnancy, including chronic hypertension and pregnancy-associated hypertension (i.e., gestational hypertension, preeclampsia-eclampsia, and chronic hypertension with superimposed preeclampsia), are associated with poor maternal, fetal, and neonatal outcomes. Based on one publication from the American College of Obstetricians and Gynecologists (2013), pregnant women with Medicaid insurance have an increased risk for complications in pregnancy and poor fetal outcomes compared with women with private insurance. Annually on average, an estimated 22,633 deliveries are from women who have Medicaid insurance in Mississippi.

The data below (Figure 12) indicates the percentage of women [by race] who were diagnosed with hypertension using the O10 ICD-10 grouped codes in 2021. These codes capture data for women who were diagnosed with *pre-existing hypertension complicating pregnancy, childbirth and the puerperium* in 2021. The data derived from the CDC's National Syndromic Surveillance Program (NSSP).

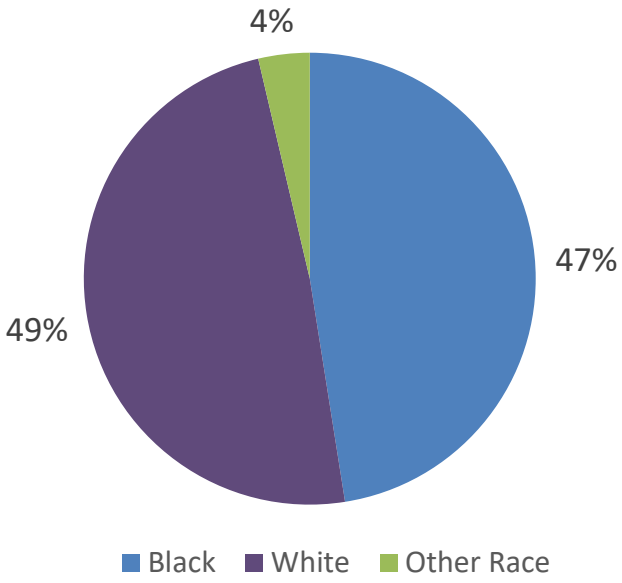
Figure 12. Percentage of Women Diagnosed with Pre-Existing Hypertension, Mississippi, 2021



Source: National Syndromic Surveillance Program (NSSP)/Biosense, 2021

Pre-eclampsia is a pregnancy related high blood pressure disorder whereby blood supply to the fetus is reduced (National Institutes of Health, 2017). Figure 13 represents women [by race] who were diagnosed with *pre-eclampsia during pregnancy* in Mississippi in 2021. The diagnoses were coded using the O14 ICD-10 grouped codes.

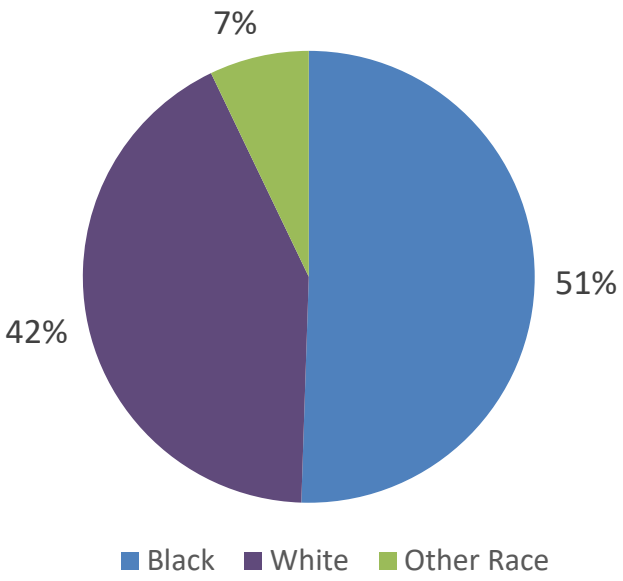
Figure 13. Percentage of Women Diagnosed with Preeclampsia, Mississippi, 2021



Source: National Syndromic Surveillance Program (NSSP)/Biosense, 2021

Diabetes. Poorly controlled diabetes before pregnancy (Type 1 and Type 2) increases the risk of many birth defects including heart, neurologic, musculoskeletal and pulmonary defects. In the United States, about 1% to 2% of pregnant women have type 1 or type 2 diabetes and about 6% to 9% of pregnant women develop gestational diabetes (CDC, 2018). Figure 14 represents the percentage of women [by race] in Mississippi who was diagnosed as having *diabetes mellitus in pregnancy, childbirth, and the puerperium* in 2021. The diagnoses were coded using the O24 grouped ICD-10 codes.

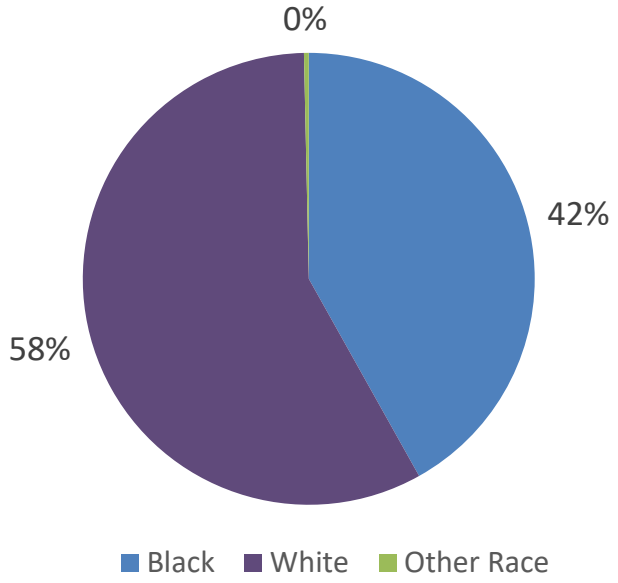
Figure 14. Percentage of Women Diagnosed with Diabetes Mellitus in Pregnancy, Mississippi, 2021



Source: National Syndromic Surveillance Program (NSSP)/Biosense, 2021

Obesity. Babies born to obese mothers have a higher rate of cardiac defects and are twice as likely to have neural tube defects compared to babies born to mothers who are not obese. Diagnosis of cardiac and neural tube defects can be more difficult in obese women because having too much body fat can make it difficult to see certain problems with the fetus's anatomy on an ultrasound exam (ACOG, 2023). Figure 15 indicates the percentage of women [by race] in Mississippi who had *obesity as a chief complaint either during pregnancy or delivery* in 2021. Furthermore, the majority (45%) of infant deaths in 2021 occurred among women who were obese.

Figure 15. Percentage of Women Discharged with Obesity as a Chief Complaint During Pregnancy or Delivery, Mississippi, 2021

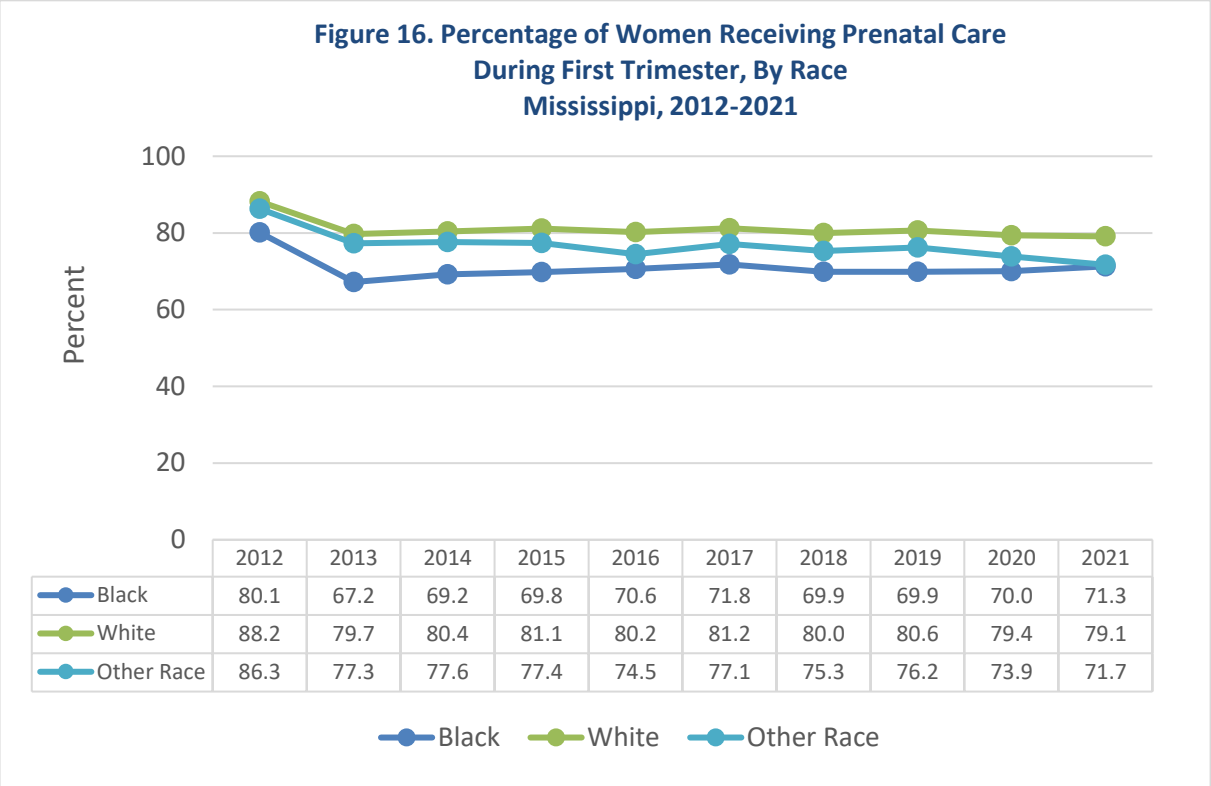


Source: National Syndromic Surveillance Program (NSSP)/Biosense, 2021

Other Morbidities During Pregnancy

In addition to pre-existing conditions, morbidities such as not receiving adequate prenatal care, smoking and/or delivering one or multiple very low birth weight (VLBW) babies can contribute to the state's infant mortality. These may exist and can lead to several health issues that increases the burden of pregnancy and could pose a complicated and/or risky delivery. As indicated in the data, disparities vastly exist in Mississippi among women who received inadequate prenatal care, smoked during pregnancies, and/or had a very low birth weight delivery.

Inadequate Prenatal Care. It is important for every pregnant woman to enter prenatal care as early as possible. Early entry into prenatal care is key to identifying any potential issues early and increase the chances of having a healthy baby. Based on data results (Figure 16), the percentage of women who received prenatal care during the first trimester has drastically decreased from 2012 to 2021.



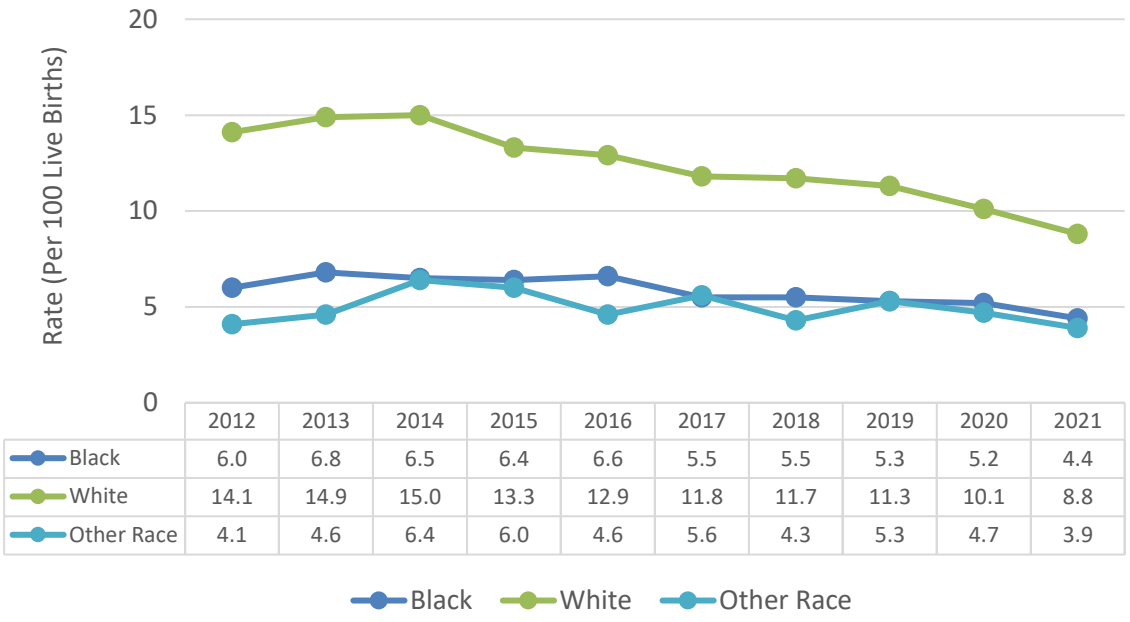
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Black	80.1	67.2	69.2	69.8	70.6	71.8	69.9	69.9	70.0	71.3
White	88.2	79.7	80.4	81.1	80.2	81.2	80.0	80.6	79.4	79.1
Other Race	86.3	77.3	77.6	77.4	74.5	77.1	75.3	76.2	73.9	71.7

Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2012-2021

Smoking. Cigarette and/or related smoking before or during pregnancy increases a woman's risk for adverse pregnancy outcomes and the health of the baby before and after delivery. Adverse outcomes may include a host of conditions and pregnancy complications (e.g. premature rupture of membranes, placenta previa, placental abruption, ectopic pregnancy, preterm birth); fetal growth restriction and low birthweight; congenital malformations, like orofacial clefts; adverse effects on fetal lung and brain development; stillbirth; perinatal mortality; and SIDS (CDC, 2014). In 2021, of the 35,166 births, 2,405 (6.8%) of women indicate that they smoked during pregnancy according to birth certificate data.

As indicated in Figure 17 below, among all race groups, the rate of smoking in pregnancy has decreased. Overall, the statewide smoking pregnancy rate has decreased from 10.5 per 100 live births in 2012 to 6.8 per 100 live births in 2021.

Figure 17. Rate of Women Who Smoked During Pregnancy By Race Mississippi, 2012-2021

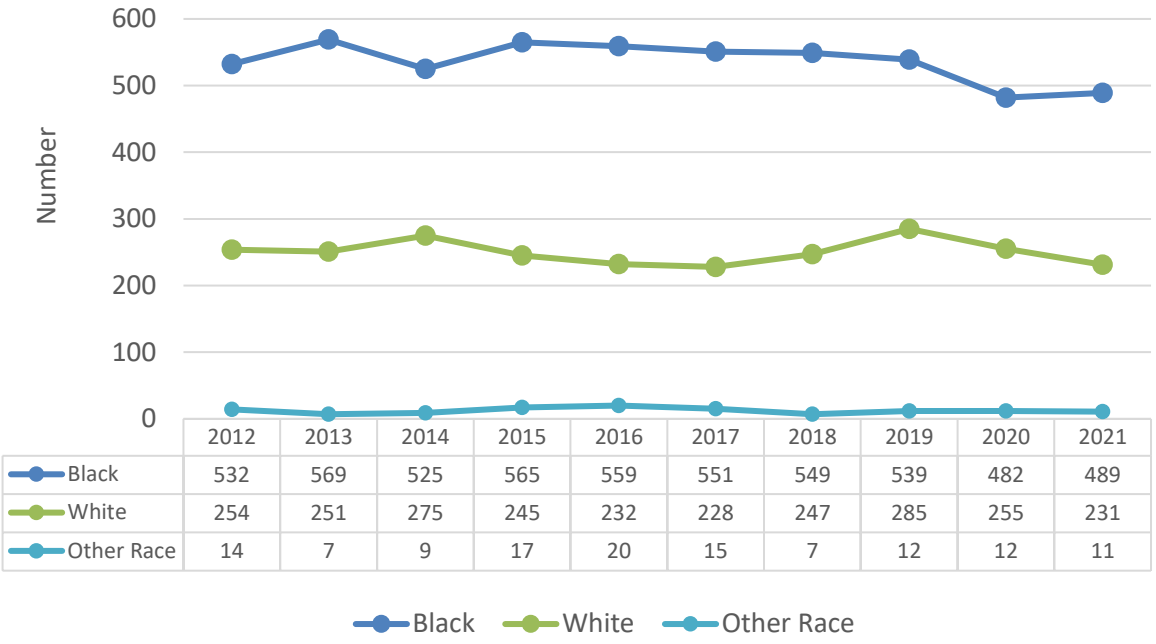


	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Black	6.0	6.8	6.5	6.4	6.6	5.5	5.5	5.3	5.2	4.4
White	14.1	14.9	15.0	13.3	12.9	11.8	11.7	11.3	10.1	8.8
Other Race	4.1	4.6	6.4	6.0	4.6	5.6	4.3	5.3	4.7	3.9

Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2012-2021

Very Low Birth Weight Deliveries. A very low birth weight delivery (VLBW) is defined as one whereby the infant weighs less than 1500 grams (Cutland, et al, 2017). Overall, the number of VLBW deliveries have decreased in Mississippi (Figure 18); however, there is still room for improvement to ensure that mothers carry their babies to full term and deliver a healthy weight baby.

Figure 18. Number of Very Low Birth Weight Deliveries By Race Mississippi, 2012-2021



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Black	532	569	525	565	559	551	549	539	482	489
White	254	251	275	245	232	228	247	285	255	231
Other Race	14	7	9	17	20	15	7	12	12	11

Source: Mississippi Statistically Automated Health Resource System (MSTAHRS), 2012-2021

KEY MSDH PROGRAMS AIMED AT INFANT MORTALITY REDUCTION

Healthy Moms/Healthy Babies (HM/HB)

The Healthy Moms/Healthy Babies of Mississippi program, provided through the Mississippi State Department of Health, is a Medicaid-reimbursed targeted (perinatal) case management (TCM) program for high-risk pregnant women and babies less than one year old. HM/HB partners with patients, communities, and medical providers to provide enhanced access to health care, nutritional and psychosocial support, home visits, and health education. The program aims to decrease preterm births, improve maternal health, decrease infant and maternal mortality, and support infant development. The program receives referrals from health department clinics, other MCH-serving programs, birthing hospitals, OB/GYN practices, other health settings, and Medicaid coordinated care organizations (CCOs) and is available to residents of all 82 Mississippi counties.

Mississippi SIDS/SUID Reduction Task Force

The Mississippi SIDS/SUID Reduction Task comprises physicians, nurses, epidemiologists, community leaders, and other leaders to address the growing number of SIDS cases in the state. The task force is charged with developing strategies aimed at decreasing the risk of SIDS/SUID in the state. Some strategies currently being discussed include, but are not limited to, addressing infant safe sleep practices, effectively reaching young mothers (teens to age 24), and determining the causes resulting in the increases across the state.

Count the Kicks© Program

The MSDH also has an active statewide Count the Kicks © program. This program conducts community-based outreach activities for pregnant women. The success of the program comes from partnering with maternal health and non-clinical providers to ensure that all expectant parents are aware of the importance of paying attention to their baby's movements, learning what are normal movement patterns for their baby, and telling their provider right away if they detect any changes. Providers, community organizations, healthcare facilities can request and receive free toolkits tailored to assist families expecting a newborn. In addition to toolkits,

families expecting a newborn can also download a free app to effectively monitor fetal movement during pregnancy.

Cribs for Kids Program

The Cribs for Kids program is nationally recognized for providing families with portable cribs. Using available grant funding, the MSDH is able to provide access to free portable cribs for families who have the greatest need due to poverty, socioeconomics, etc. In addition, families receive free packets which includes a sleep sack, literature referencing infant safe sleep and a pacifier. The MSDH staff, such as nurses and social workers, make home visits to provide evidence-based safe sleep education, demonstration, and instruction on crib setup.

MSDH Maternal and Children's Health Program

The MSDH Maternal and Children's Health Program (i.e. Title V Block Grant) is responsible in leading and supporting efforts in local communities and across the state to improve the health and wellbeing of pregnant women, infants, children [with and without special health care needs], adolescents, and others in the state. To address national and state performance measures, this program strategically coordinates activities and efforts with partners and stakeholders to improve health outcomes for the state's maternal and children's health (MCH) population. This strategic alignment is imperative in assuring the greatest impact of improved MCH health outcomes statewide through clinical and support services currently established within the county health departments.

Healthy Start – Northeast Mississippi

The Northeast Mississippi Healthy Start Initiative began September 2023. The outlined activities and strategies for the program will be incorporated within a coordinated maternal system of care via the following activities:

- Improve health conditions for women before (preconception), during, and after pregnancy via direct and enabling healthcare and support services.
- Enhance quality of life and/or health conditions for infants up to 18 months of age.
- Decrease the number of Sudden Unexpected Infant Deaths (SUIDS) in the target region.
- Develop a comprehensive and coordinated maternal system of care.
- Utilize community health workers/peer educators to recruit and retain families

participating in the program.
- Incorporate a robust referral system via MSDH's Healthy Moms/Healthy Babies program for high-risk mothers to receive additional healthcare and resources.
- Develop a peer-to-peer model to enhance the support of fathers/men via
- Address social determinants of health that impede mothers and/or infants from receiving healthcare and/or other needed resources.

Women, Infants, and Children (WIC)

To complement other MCH-related activities, the agency's WIC program provides special supplemental food support for pregnant, breastfeeding, and post-partum women. In addition, these services are also provided to infants and children under the age of five. The WIC program provides dietary counseling, educational resources, and referrals [as needed] to each participant.

MSDH Office of Tobacco Control (OTC) and Prevention

The MSDH's Office of Tobacco Control (OTC) implements a range of integrated programs to encourage and support tobacco-free lifestyles. The OTC provides funding that covers the 82 counties of the state and implement tobacco control programs at the grassroots level. The office also assists in creating community-based coalitions that work to educate municipalities and schools regarding smoke-free air, prevent the initiation of tobacco use among youth, reduce exposure to secondhand smoke, promote cessation services, and eliminate tobacco-related disparities. The OTC also promotes tobacco cessation services among expecting mothers, fathers, and caregivers of infants.

MSDH Office of Newborn and Genetics Screening

The MSDH's Newborn and Genetics Screening Program tests infants for heritable disorders that can threaten the health or well-being of the infant(s). The program provides genetic counseling via a physician to parents of children whose results indicate a genetic disorder. In addition, the program offers these early screenings so that families can receive the necessary treatment and services to help their baby/children have the best chance to thrive regardless of the condition(s) in which they were diagnosed.

MSDH Lead/Healthy Homes Initiative

The MSDH Lead and Healthy Homes program distributes infant safe sleep materials and resources to families and communities around the state. The program also educates families, businesses, and communities about hazards including mold, mildew, pests, carbon monoxide and lead. These types of hazards can put infants and their families at greater risk for developing asthma, allergies and cancer.

MSDH Early Intervention Program (First Steps)

The MSDH's Office of Early Intervention/First Steps Program supports families of infants and toddlers under three years of age who have a developmental delay, or who have a diagnosed condition that's likely to cause delays in development. The program contracts with and/or employs providers including physicians, early interventionists, social workers, etc. to work directly with families, guiding them to help their child learn at home, in their community, and in care and education programs. The program provides family-centered services and helps families obtain information, emotional support, and material supports in their community to meet the unique needs of their child and the family.

DATA SOURCES FOR TABLES AND FIGURES

The vast majority of data for this report were obtained from the Mississippi STatistically Automated Health Resource System (MSTAHRS) and the Mississippi State Department of Health, Public Health Statistics Division. Additional data (Figures 12-15) were obtained from the Centers for Disease Control's (CDC) National Syndromic Surveillance Program/Biosense Platform.

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