Wisconsin Perinatal Periods of Risk (PPOR) Analysis, 2015–2019

Understanding Inequities in Fetal and Infant Mortality Impacting Non-Hispanic Black Communities

WISCONSIN DEPARTMENT of HEALTH SERVICES

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Acknowledgements and Report Details

Data sources

Wisconsin Department of Health Services: Office of Vital Records. Birth, 2015–2019.

Wisconsin Department of Health Services: Office of Vital Records. Fetal Death, 2015–2019.

Wisconsin Department of Health Services: Office of Vital Records. Linked Birth/Infant Death, 2015–2020.

Wisconsin Pregnancy Risk Assessment Monitoring System (PRAMS), 2015–2019.

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Language

In order to be inclusive of all who have the ability to become pregnant and give birth, this report uses terms such as "birthing person" or "birthing parent."

Grief support and bereavement resources

The contents of this report can be emotionally heavy. Information about grief support and bereavement resources is available through the Maternal and Infant Mortality Related Resources and Data webpage.

Honoring Life

With this report, we give acknowledgement to the families in Wisconsin who survive infant loss, promising this work aims to lift and honor survivors and their loved ones. We remember them in this space. We center this work around the value of life, as we recognize no family should have this experience, and we give our sincere condolences with respect to their loved ones.

These data represent lives, and with this work we wish to demonstrate the value we have for each person who was lost too soon. We cherish them with this work. We center ourselves in this time with love to honor their memory and the beautiful way in which life was given to us.

We give our condolences and consideration to survivors, with the intentional and continual practice of improving healthy birth outcomes by eliminating racial disparities and prioritizing measurable change to reach the lives of families.

It is important for us to acknowledge that unjust and oppressive systems carry the blame for health inequities, not individuals. This work aims to understand how to dismantle historical racism in the health system and establish the action steps required to narrow the gap of birth disparities, working towards lowering the rate of loss, so that all families experience a healthy birth outcome and our babies have a happy healthy first birthday.

Felica and Zaire

Felica's pregnancy with her son, Zaire, went smoothly and was a peaceful pregnancy. Her doctors initially had concerns that Zaire could be born at a low birthweight, giving Felica the opportunity to see him at ultrasounds every two weeks. Following an easy labor and delivery on October 22, 2015, Zaire was born. She recalled, "A couple of pushes and here's Zaire, a happy, healthy 6 lbs. 11 oz. baby."

Felica and Zaire after his birth on October 22, 2015

Zaire brought so much light and joy into the world. Felica recalled how Zaire would show her things—like crawling and sitting up on the couch—her taking pictures of him, and him being in a robe after she bathed him. Zaire loved being around his mother. "If I left out of the room, it was like he knew. And so he would start crying. Even though my bathroom was right in my room, I would have to put him in his bouncer and bring him in the bathroom while I showered so that we could be close to one another." Felica shared special memories of her time with Zaire, which included their nightly rituals before bath time. Felica would be holding Zaire, and they would dance to music around the house. Zaire's sister would join in and they would all dance together and enjoy the moment. All of Zaire's siblings and family enjoyed being around him. His sister formed a special bond with him and liked to help take care of him. "He lit up the house in a way that I think we all needed… He was the definition of love for us, for me."

Honoring Life

Zaire at three months

Felica reflected on those moments with her son, "It was like he knew that he wasn't going to be here forever and that he needed to give us enough to hold on to." When Zaire was four months old, he passed away unexpectedly. Felica described her initial experience, "I was outside of myself watching myself going through what I was going through." Her next steps were uncertain. "While it was easy for me to figure out what I wanted for his life, I didn't know and didn't understand what to do regarding his death."

Like many Black and Brown folks, Felica was not given the opportunity to grieve. Needing to provide for her family, she returned to work only to find that she had been reassigned and her workplace was unsupportive. "I wanted to grieve, but I couldn't because I had to go to work to take care of my other children and pay the bills and do all these things." Traditional avenues of grief support were not a good fit. Felica experienced anxiety and suicidal ideation during this time. After some time had passed, she claimed the space that she needed. She thought, "No, I'm going to grieve. If I don't do anything else, I'm going to do this. Not only because I deserve it, but my son deserves it as well."

Social determinants of health impact one's ability to have the space and opportunity to grieve, impacting Black and Brown communities the greatest. Grief is also influenced by generational trauma and personal history. Felica connected with the 5 Stages of Black Grief, as conceptualized by Dr. Stacy Scott: despair, self-blame, move to action, endurance, and survival.[1] Change is needed to ensure that everyone has support following loss. Legislation, such as the proposed Bereavement Act, could help to support individuals who have lost children by ensuring proper time off work to grieve.

Felica began to connect with other parents who experienced loss. A couple months after Zaire's passing, Felica's friend connected her with someone else who just lost their baby. They were able to share their experiences and support each other. Felica learned of others in her community who lost their children. She would ask them about their experiences of grief to find that many of them were not able to get the support they needed. "I got so tired of hearing the word 'strong' and 'resilient'. It's like, no I'm not, I'm secretly breaking down on the inside." She connected with so many others who shared similar experiences and realized that they were all supporting each other.

Throughout her life, Felica has always helped others. She now continues to help through the non-profit organization that she founded, Healing our Hearts. Healing our Hearts works with people who have experienced loss and specifically creates spaces for Black and Brown folks to grieve. Her lived experience helps her to connect with the peers she works with. Through her work, she helps others navigate loss, and they also help her. "It's personal for me. The profession of it is secondary." Felica remembers and honors her son through her work.

Photos courtesy of Felica

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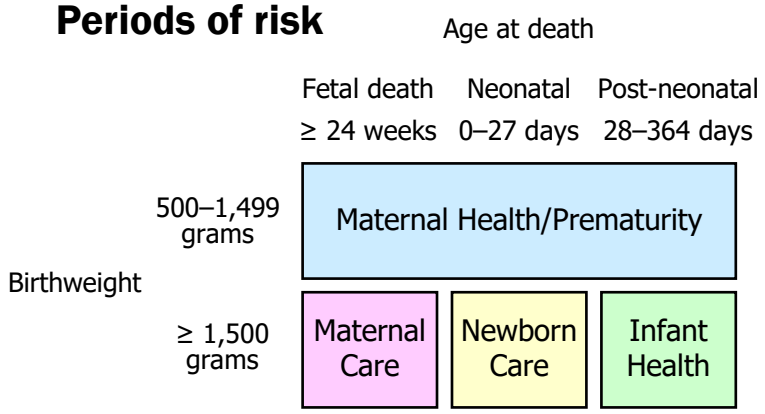
Executive Summary

What is PPOR?

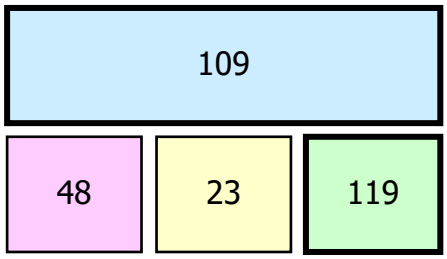
Perinatal Periods of Risk (PPOR) identifies how many deaths could be avoided if death rates were the same across different groups. Death rates for **populations impacted by inequities** are compared to lowest observed rates to better **understand excess deaths**. Understanding what causes inequities in fetal and infant deaths helps us to focus prevention efforts.

Periods of risk



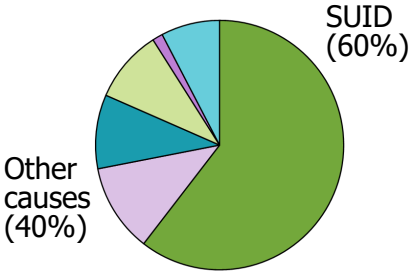
When do excess fetal and infant deaths occur? (2015–2019)

Excess non-Hispanic Black fetal and infant deaths



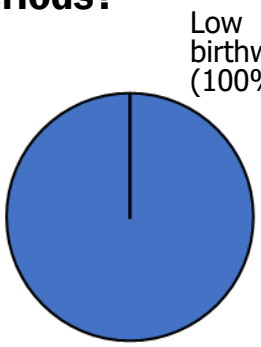
Most excess deaths occur within the **Infant Health** and **Maternal Health/Prematurity** periods of risk.

What causes excess deaths within these periods?



Sudden Unexpected Infant Death (SUID) is the leading cause of excess deaths within the **Infant Health** period.

Note: SUID includes sudden infant death syndrome and accidental suffocation or strangulation in bed.



Having **higher rates of low birthweight** contributes to excess deaths within the **Maternal Health/ Prematurity** period.

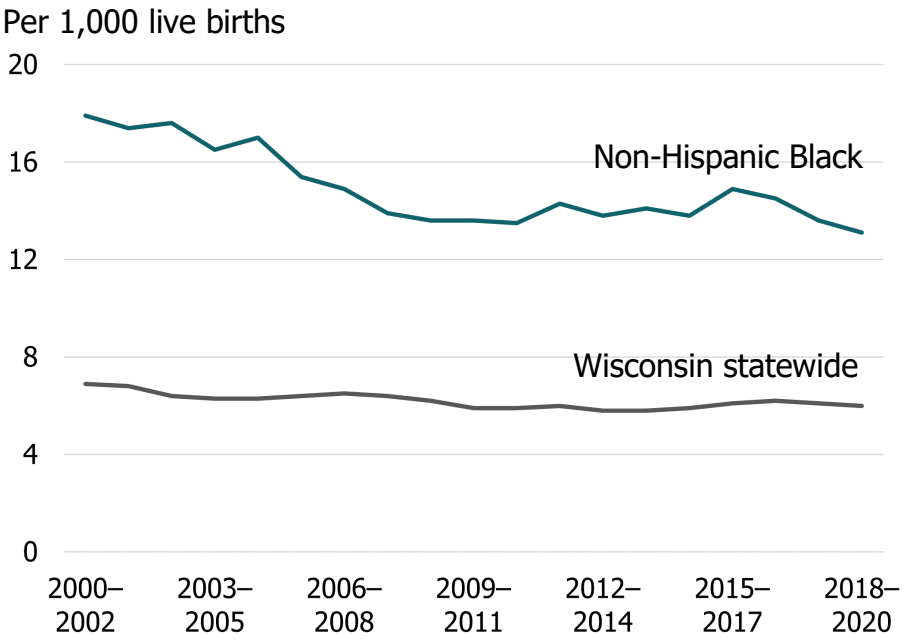
How can PPOR findings be used?

The PPOR analysis helped to identify **two key prevention areas: SUID and low birthweight**. Focusing on SUID and low birthweight prevention may help to reduce excess fetal and infant deaths and inequities impacting non-Hispanic Black communities in Wisconsin. When working to improve health outcomes, it is important to know that oppressive systems carry the blame for health inequities, not individuals. Prevention should include efforts that intervene at the systemic level.

Infant Mortality in Wisconsin

Infant mortality rates have historically been, and continue to be, highest among non-Hispanic Black communities in Wisconsin. From 2018–2020, the mortality rate was 2.2 times higher for non-Hispanic Black infants compared to the statewide rate. It is important to address and reduce this longstanding inequity.

Infant mortality rate, 2000–2020



Leading causes of infant death, 2015–2019

Wisconsin statewide	Non-Hispanic Black
Birth defects (21%)	Short gestation or low birthweight (22%)
Short gestation or low birthweight (20%)	Birth defects (12%)
Pregnancy complications (6%)	Pregnancy complications (5%)
Unintentional injuries (5%)	Unintentional injuries (5%)
Placenta, cord, membrane (4%)	Placenta, cord, membrane (5%)

We already know the leading causes of death for non-Hispanic Black infants and can loosely compare them to the leading causes of infant death in Wisconsin statewide. However, making these crude comparisons of the top causes of death between groups is complex and does not clearly tell us what causes disparities or how public health can help reduce them. That is where Perinatal Periods of Risk (PPOR) analysis can help.

Overview of PPOR

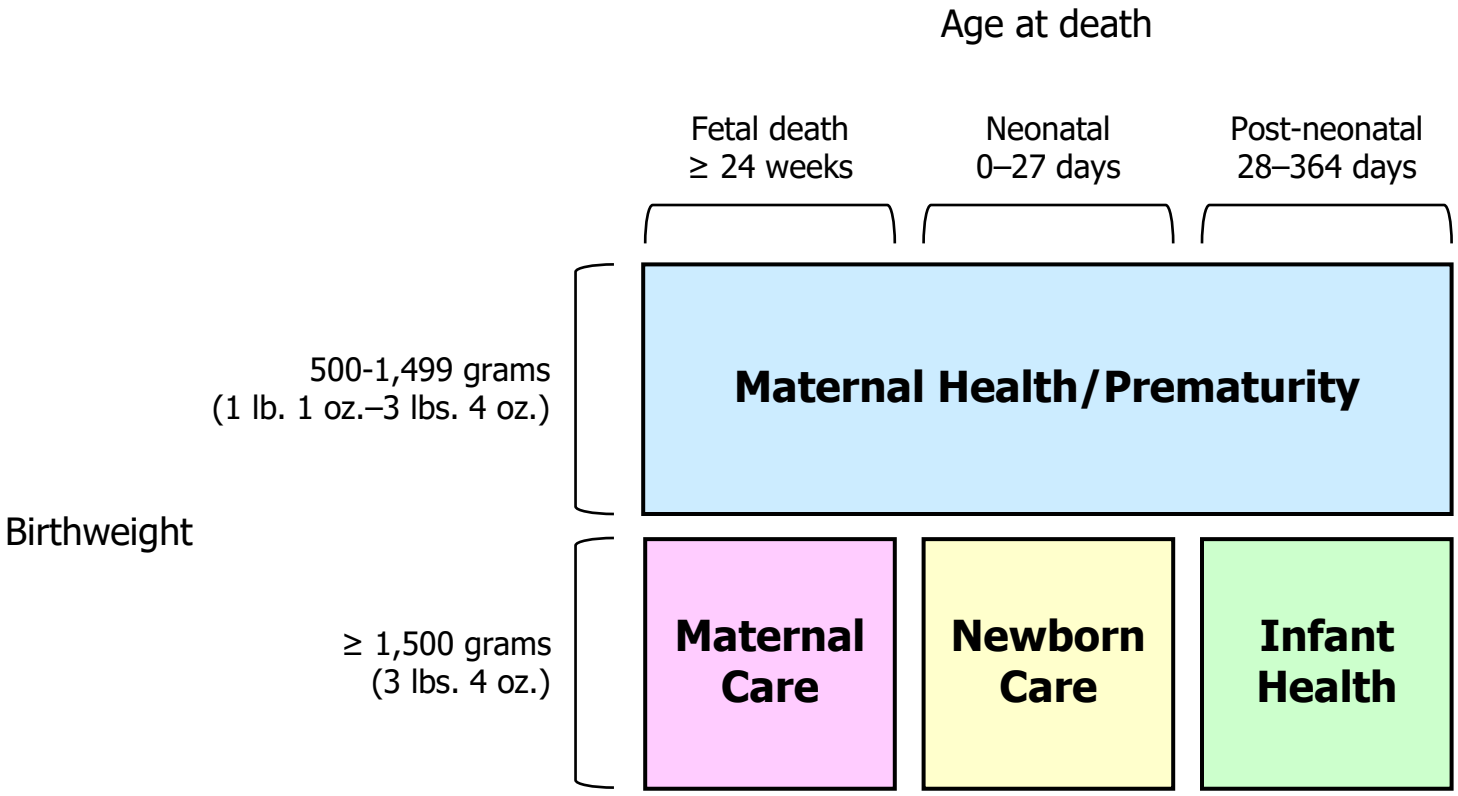
What is PPOR?

Perinatal Periods of Risk (PPOR) is an analysis framework developed by CityMatCH.[2] Its purpose is to help us understand what causes inequities in fetal and infant deaths so that we can better focus prevention efforts.

During the analysis, fetal and infant death rates for populations impacted by inequities are compared to the lowest observed death rates to better understand excess deaths. Excess deaths are deaths that could have been avoided if death rates were the same across groups. They are the result of inequities and are preventable.

The PPOR analysis is split into two phases. The purpose of Phase I is to look at birthweight and age at death to discover when the most excess deaths occur. Then Phase II is when we dive deeper into the causes of excess deaths to discover how excess deaths occur.

PPOR is based on the sorting of fetal and infant deaths into one of four periods of risk, as shown below. The periods differ from each other based on birthweight and age at death.



Overview of PPOR

Why use PPOR?

Deaths that occur within a period often share similar characteristics or causes. Once we understand when the excess deaths are occurring, we can focus on factors that impact health within that period. This is how PPOR findings can help to focus prevention areas.

To the right are a few examples of prevention areas that could be focused on for each period. This is especially important if we find that many excess deaths occur within a specific period.

If many excess deaths occur within the:	then prevention areas may include:
Maternal Health/ Prematurity period →	preconception health, perinatal care access, social determinants of health
Maternal Care period →	prenatal care access, high-risk referral procedures, obstetrical care access
Newborn Care period →	pediatric surgery, perinatal management, neonatal care access
Infant Health period →	sleep environment, infant feeding support, injury prevention programs

Focus of this analysis

All individuals included in the analysis were Wisconsin residents at the time of birth. Infant race and ethnicity were based upon self-identified race and ethnicity of the parent who gave birth.

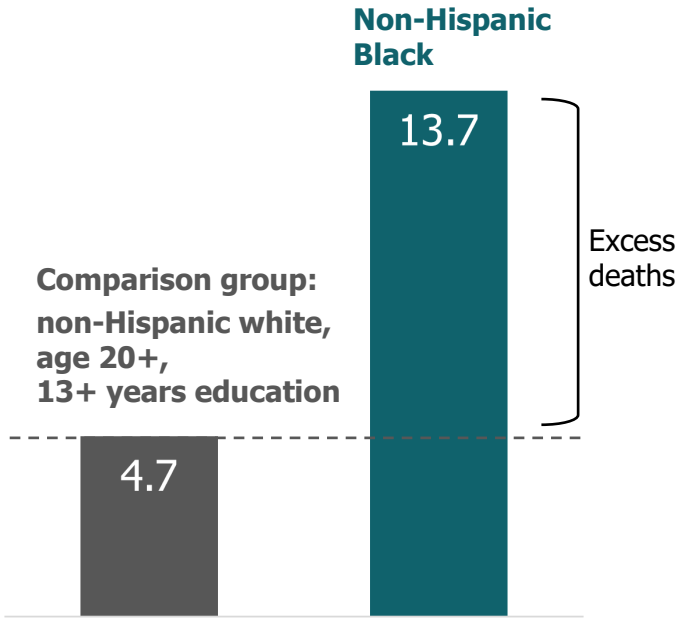
This PPOR analysis aims to better understand the causes of inequities that impact **non-Hispanic Black** infants in Wisconsin.

Throughout the PPOR analysis, the **comparison group** will consist of infants born to persons who are non-Hispanic white, were 20 years or older at the time of birth, and had completed some college or higher at the time of birth. This population experiences the lowest observed fetal and infant mortality rates.

Fetal and infant mortality rates for non-Hispanic Black infants (total rate per 1,000 live births and fetal deaths = 13.7) will be compared to rates for infants in the comparison group (total rate = 4.7). Comparing these rates allows for the understanding of excess deaths that occur among non-Hispanic Black infants.

Fetal and infant mortality rate, 2015–2019

Per 1,000 live births and fetal deaths



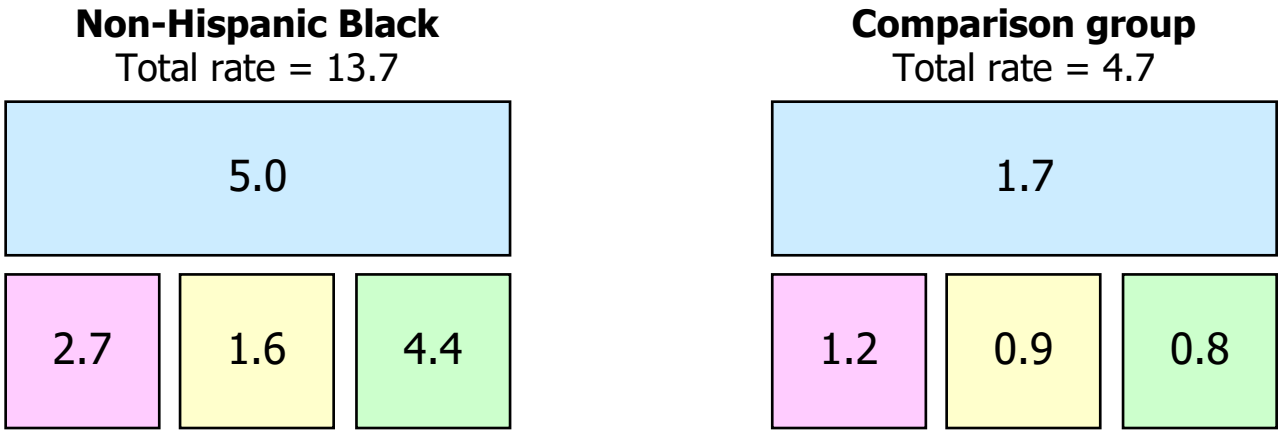
Phase I

Phase I of PPOR helps us understand which period of risk has the most excess deaths.

The analysis begins with the sorting of fetal and infant deaths into periods of risk for the non-Hispanic Black and comparison populations. Fetal and infant mortality rates (per 1,000 births and fetal deaths) are calculated for each population and period of risk. The rates for each of the periods of risk add up to the total fetal and infant mortality rate.

Fetal and infant mortality rate, 2015–2019

Per 1,000 live births and fetal deaths

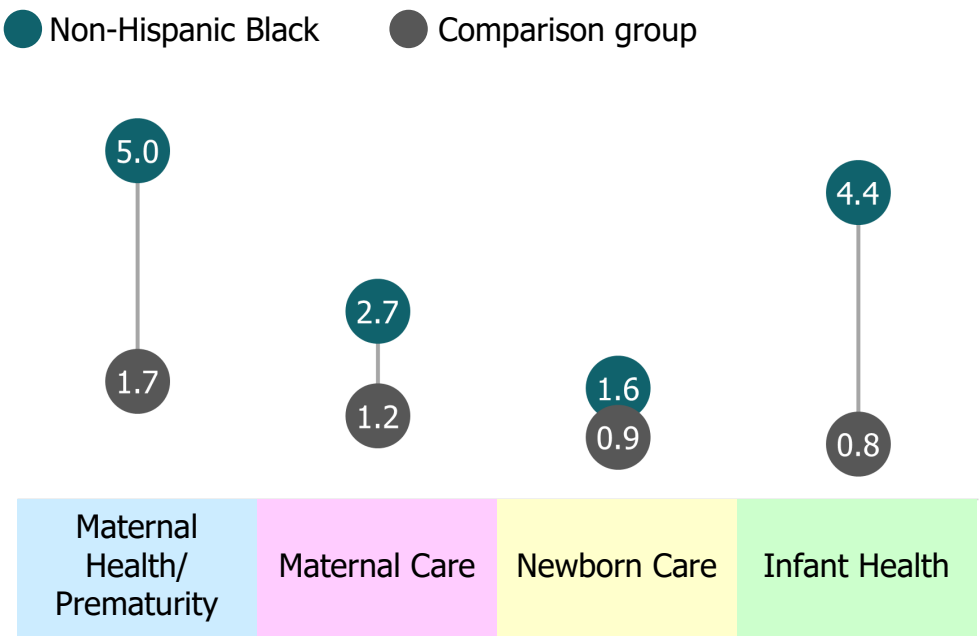


Using rates allows us to compare health outcomes between groups. Non-Hispanic Black infants experience higher mortality rates across all four periods of risk. The visual comparison of rates to the right shows that the Infant Health and Maternal Health/ Prematurity periods have the greatest difference in rates between populations.

The next step is to mathematically compare rates to calculate excess rates and deaths.

Mortality rates by population and period, 2015–2019

Per 1,000 live births and fetal deaths

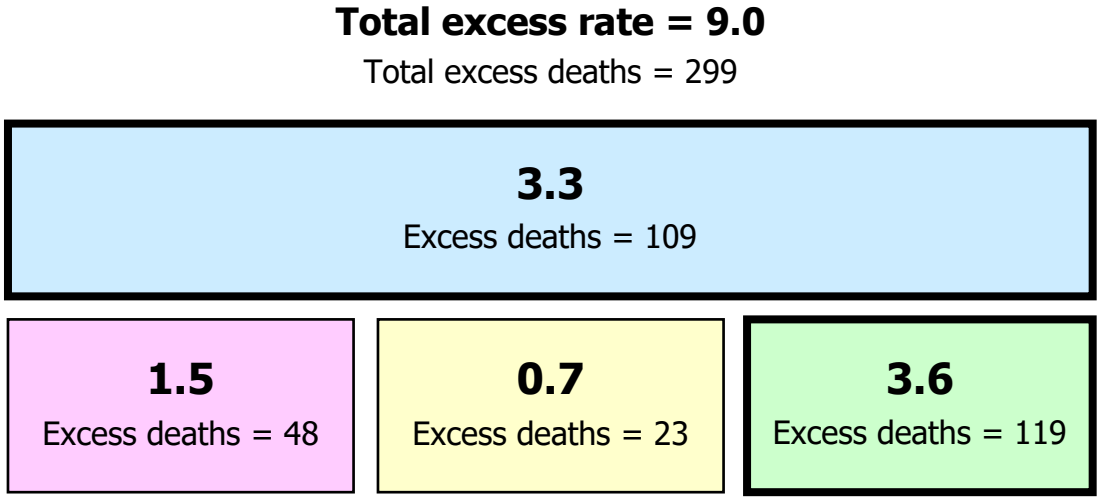


Phase I

Fetal and infant mortality rates for the comparison group are subtracted from rates for the non-Hispanic Black population. This results in **excess** rates, which can be converted into **excess** deaths.

Excess mortality rates for Non-Hispanic Black population, 2015–2019

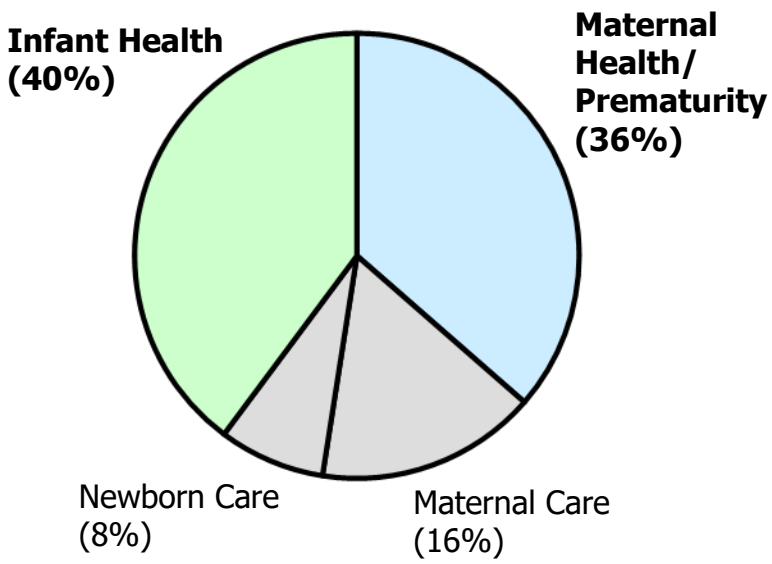
Per 1,000 live births and fetal deaths



From 2015 to 2019, there were 299 total excess deaths to non-Hispanic Black birthing persons. There were 109 excess deaths that occurred within the **Infant Health period**, more than any other period of risk. The Infant Health period accounted for 40% of excess non-Hispanic Black deaths. Many excess deaths also occurred within the **Maternal Health/Prematurity period**. This period had 109 excess deaths (36%).

Investigating the causes of death within these two periods of risk may help us to further focus prevention areas.

Contribution to excess non-Hispanic Black fetal and infant deaths



Phase II for Infant Health Period

Phase I identified the Infant Health period as having the highest number of excess non-Hispanic Black deaths. Phase II will take a closer look at how deaths occur within the Infant Health period. Death rates due to different causes will be compared between the non-Hispanic Black and comparison populations. This comparison allows for the calculation of excess deaths by cause within this period. Understanding the cause that accounts for the greatest number of excess deaths can help to more narrowly focus prevention efforts.

Reminder

The Infant Health period includes deaths where:

- Birthweight was greater or equal to 1,500 grams.
- Age at death was between 28–364 days.

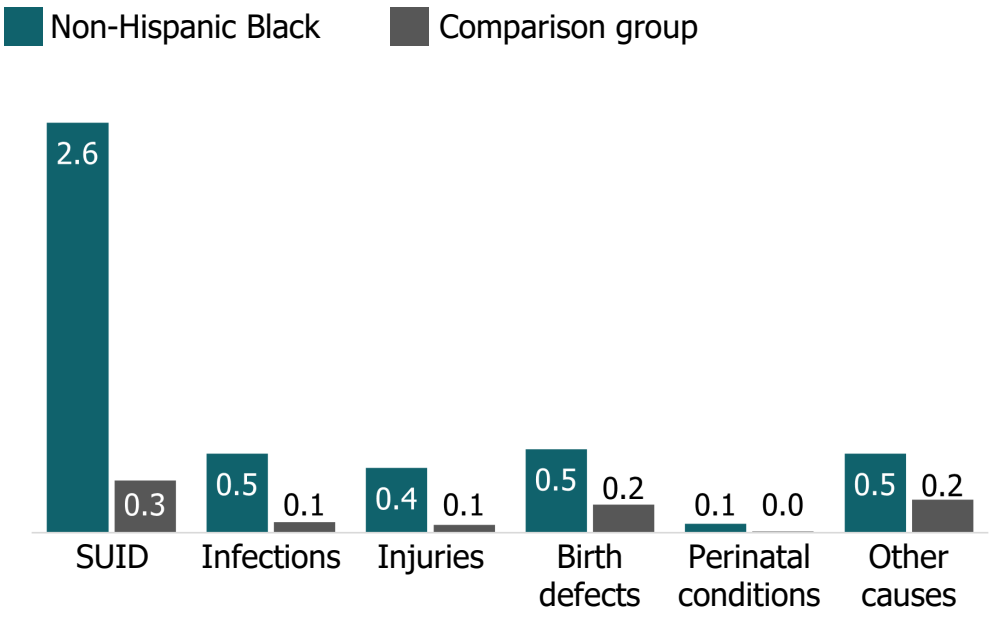
Causes of death within the Infant Health period were determined by the International Classification of Diseases 10th Revision (ICD-10) codes listed on the infant death certificate. Causes were grouped into one of six categories. Go to the Data Notes section for further details on the categorization of cause of death by ICD-10 codes.

Cause of death categories

- Sudden unexpected infant death (SUID)—includes SUID, sudden infant death syndrome (SIDS), and accidental suffocation and strangulation in bed
- Infections
- Injuries
- Birth defects
- Perinatal conditions
- Other causes

Infant mortality rates by population and cause of death, 2015–2019

Per 1,000 live births, among deaths within Infant Health period



Infant death rates are calculated for each cause of death category, capturing only deaths occurring within the Infant Health period. These rates are compared between the non-Hispanic Black and comparison populations to calculate excess rates and deaths.

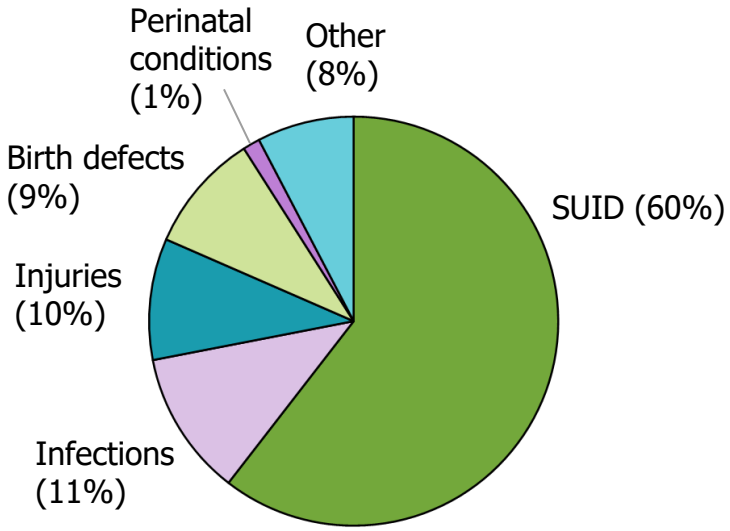
Phase II for Infant Health Period

For each cause of death category, infant mortality rates for the comparison group are subtracted from rates for the non-Hispanic Black population to calculate excess rates. Excess rates are used to calculate the number of excess non-Hispanic Black deaths due to each cause within the Infant Health period.

The leading cause of **excess** deaths within **the Infant Health period** is SUID with 72 excess deaths. SUID accounts for 60% of excess Infant Health Period deaths. Prevention efforts should focus on reducing SUID. These efforts may help to reduce excess deaths within the Infant Health period and overall disparities in infant mortality.

Cause of death category	Number of excess non-Hispanic Black deaths
Sudden unexpected infant death (SUID)	72
Infections	14
Injuries	11
Birth defects	11
Perinatal conditions	2
Other causes	9

Contribution to excess non-Hispanic Black deaths within Infant Health Period



Reminder

SUID cause of death category includes:

- SUID.
- SIDS.
- Accidental suffocation and strangulation in bed.

Phase II analysis identified sudden unexpected infant death (SUID) as the largest cause of excess deaths within the Infant Health period.

Phase II for Maternal Health/Prematurity Period

Phase I identified the Maternal Health/Prematurity period as having a high number of excess non-Hispanic Black deaths. Phase II will take a closer look at how deaths occur within the Maternal Health/Prematurity period. The analysis will examine what contributes more to excess deaths within this period: low birthweight or mortality among low birthweight babies. Differentiating the influence of these two causes can help to focus prevention efforts.

Reminder

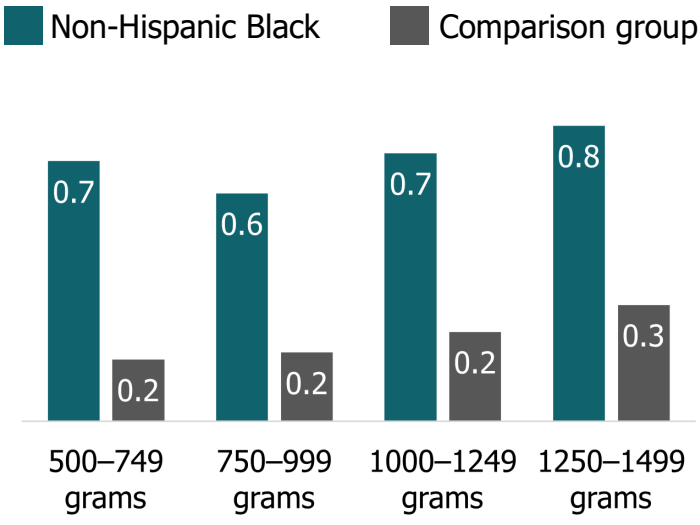
The Maternal Health/Prematurity period includes deaths where:

- Birthweight was 500 to 1,500 grams.
- Age at death was from 24 gestational weeks through 364 days.

Phase II for the Maternal Health/Prematurity period utilizes the Kitagawa analysis technique (go to the Data Notes section for further details on the Kitagawa analysis). The analysis will determine if excess non-Hispanic Black deaths within the Maternal Health/Prematurity period are due to higher rates of low birthweight or higher mortality rates. Both rates of low birthweight and rates of mortality among very low birthweight babies are compared between the non-Hispanic Black and comparison populations.

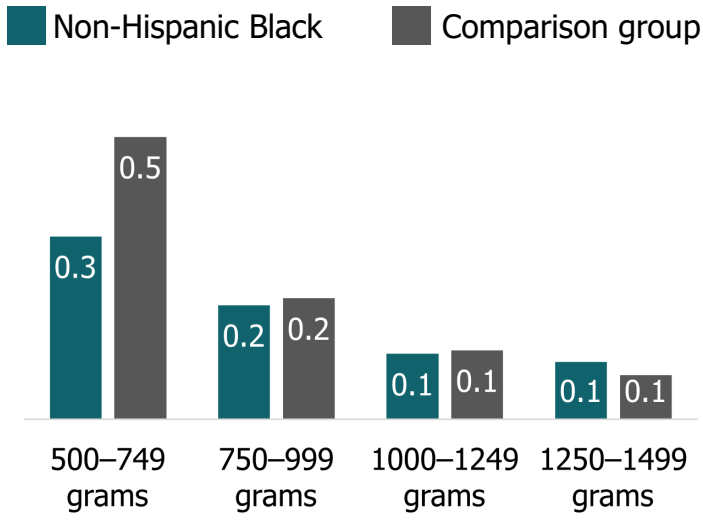
Rates of low birthweight by population and birthweight, 2015–2019

Percentage of live births and fetal deaths, among deaths within Maternal Health/Prematurity period



Infant mortality rates by population and birthweight, 2015–2019

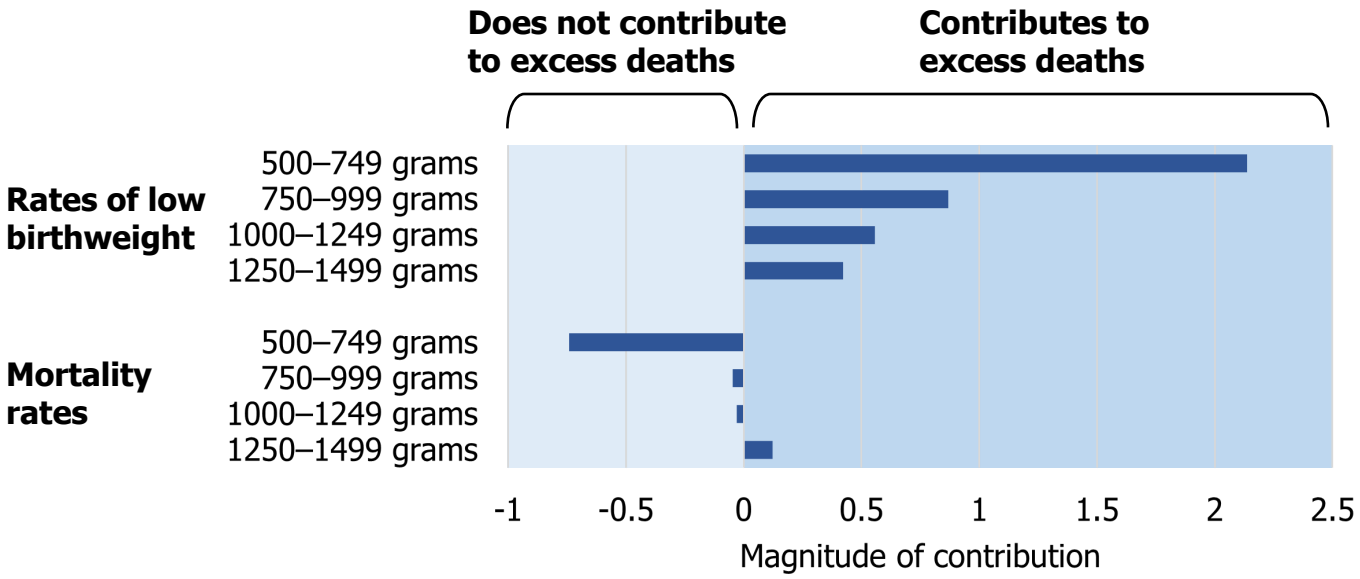
Per 1,000 live births and fetal deaths, among deaths within Maternal Health/Prematurity period



The graph on the left shows us that non-Hispanic Black infants are more likely to be born at a very low birthweight (less than 1,500 grams) than infants in the comparison group. The graph on the right shows that, among infants born at very low birthweights, non-Hispanic Black infants experience lower or similar mortality rates compared to infants in the comparison group.

Phase II for Maternal Health/Prematurity Period

Contribution to excess non-Hispanic Black deaths within Maternal Health/Prematurity period



All **excess** deaths within the Maternal Health/Prematurity period are attributable to higher rates of very low birthweight among the non-Hispanic Black population. Rates of low birthweight account for 100% of excess Maternal Health/Prematurity period deaths (109 excess deaths from 2015–2019). Prevention efforts should focus on increasing birthweight. These efforts may help to reduce excess deaths within the Maternal Health/Prematurity period and overall disparities in infant mortality.

100%

of **excess** non-Hispanic Black deaths **within the Maternal Health/Prematurity period** are attributable to higher rates of **low birthweight**.

Phase II analysis identified higher rates of low birthweight as contributing to excess deaths within the Maternal Health/Prematurity period.

Using PPOR Findings

The PPOR analysis helped to identify **two key prevention areas: SUID and low birthweight**. Focusing on SUID and low birthweight prevention may help to reduce excess fetal and infant deaths and inequities impacting Black communities in Wisconsin.

When working to improve health outcomes, it is important to know that oppressive systems carry the blame for health inequities, not individuals. Health outcomes, including birth outcomes, are impacted by racism, discrimination, socioeconomic status, access to care, insurance, housing security, support systems, and other social determinants of health. Prevention efforts should include approaches that intervene at the systemic level.

Health outcomes are further impacted by past events. Dr. Maria Yellow Horse Brave Heart defines historical trauma as the "cumulative emotional and psychological wounding over the lifespan and across generations, emanating from massive group trauma."[3] Historical trauma explains how the harm from traumatic experiences persists for future generations. Present day health outcomes, including infant mortality, are shaped by past community suffering.

In addition to historical trauma, health outcomes are further impacted by experiences of stress and discrimination throughout one's lifetime. Dr. Arline Geronimus defines weathering as the "cumulative impact or repeated experience with social or economic adversity and political marginalization."[4] Researchers have used the weathering hypothesis to explain why there are racial disparities in perinatal and infant health outcomes.

Inequities in perinatal outcomes are also impacted by past and present harms perpetuated by health care systems. Dr. Tiffany Green and colleagues note that racialized stereotyping is pervasive within these systems, from inappropriately attributing disparities to genetic differences in medical schools to including racialized identity within medical decision-making tools.[5] Although evidence suggests that seeing a Black physician may reduce mortality among Black infants, racialized stereotyping marginalizes Black physicians and prevents their perspectives from improving practices within educational and medical settings.[5] These systemic factors ultimately impact the care that Black individuals receive.

It is necessary to recognize past and current systemic harms and their impacts on health. Prevention efforts to reduce SUID and low birthweight must be trauma-informed. They must include voices and leadership from the communities they are aiming to help.

The remaining sections of the report explore in depth how prevention efforts may address SUID and low birthweight among non-Hispanic Black babies.

Prevention Area: SUID

Preventing SIDS and SUID for non-Hispanic Black babies can help to reduce infant mortality inequities. In 2022, the American Academy of Pediatrics (AAP) released updated recommendations to reduce the risk of SUID, including the following:[6]

- Infants should be placed on their backs to sleep for every sleep until one year of age.
- Infants should be placed on a firm and flat surface to sleep. The surface should be covered by a fitted sheet with no other bedding or soft objects.
- Infants should be fed with human milk, when nursing is possible. This may happen in the form of breastfeeding or chestfeeding. It is recommended that infants are exclusively fed with human milk for six months, continuing with human milk feeding for one year or longer.
- Infants should sleep in parents' room, close to the parents' bed, but on a separate surface designed for infants, ideally for the first six months of life. Many parents choose to bed share or cosleep due to facilitation of breastfeeding, cultural preferences, or personal beliefs. Although the AAP does not recommend bed sharing, factors such as being in an adult bed instead of sofa or armchair, not bed sharing with an infant born preterm, waiting until the infant is at least four months of age, avoiding heavy blankets or pillows in the bed, avoiding the use of alcohol or sedative substances, and avoiding smoke exposure during pregnancy or after birth may help to reduce the risk of SIDS while bed sharing.
- The infant's sleep area should be free from soft objects and loose bedding. Soft objects include pillows, pillow-like toys, quilts, comforters, mattress toppers, and fur-like materials. Loose bedding includes blankets and nonfitted sheets. If the infant needs to be kept warm, layers of clothing or wearable blankets are recommended. Weighted blankets or other weighted accessories should be avoided.
- Infants should be offered a pacifier at nap time and bedtime. However, for breastfed or chestfed infants, pacifier introduction should be delayed until after feeding is firmly established.
- People who are pregnant and infants should avoid smoke and nicotine exposure during pregnancy and after birth.
- People who are pregnant should avoid alcohol, marijuana, opioid, and other substance use during pregnancy and after birth.
- Infants should not be overheated or wear a head covering when indoors beyond the first hours of life or in the neonatal intensive care unit (NICU).
- People who are pregnant should obtain regular prenatal care. Prenatal care provides an opportunity for parents to be counselled on factors impacting SUID. However, access to prenatal care is often impacted by social determinants of health.

Other research from the National Institute of Child Health and Human Development identified poverty, access to care, and low birthweight as other key factors that contribute to racial and ethnic inequities in SUID.[7]

The subsequent sections explore these factors and recommendations for Wisconsin communities.

Prevention Area: SUID

Unsafe sleep environment and practices

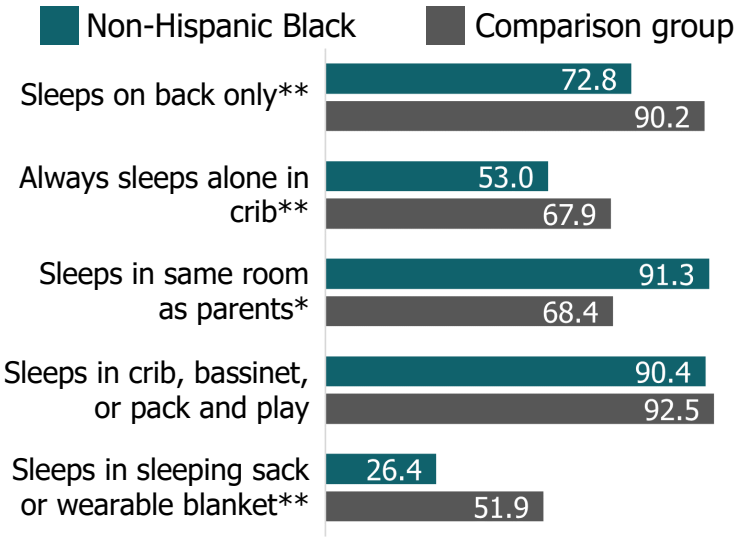
Babies sleeping in an unsafe environment or in an unsafe way are at increased risk of SUID. Data tell us that although many non-Hispanic Black babies sleep safely, there are still opportunities for improvement.

Aligning with recommendations, non-Hispanic Black infants are more likely than those in the comparison group to usually sleep in the same room as parents and less likely to sleep in an infant car seat or swing.

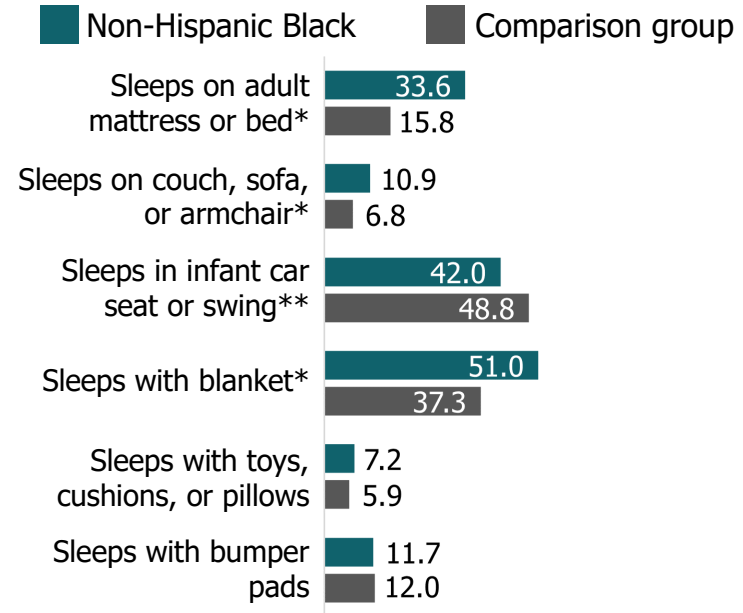
Non-Hispanic Black infants are less likely to only sleep on their back or alone in a crib than comparison group infants. They are also more likely to sleep on an unsafe surface, such as an adult mattress or bed, couch, sofa, or armchair. Over half of non-Hispanic Black infants usually sleep with a blanket. These practices can be improved upon to reduce the risk of SUID.

While parent education is important to increase safe sleep practices, it cannot be the only tool used. From 2016–2019, over 90% of non-Hispanic Black birthing parents were told by a health care provider to place baby on back to sleep, place baby to sleep in a crib, and things that should be in bed with the baby. Non-Hispanic Black birthing parents were more or just as likely to receive sleep education from a health care provider as parents in the comparison group. Other interventions should complement education to improve safe sleep practices.

Percent using safe sleep practices for infants, 2015–2019



Percent using unsafe sleep practices for infants, 2016–2019



* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: SUID

Smoke exposure during pregnancy and after birth

12.3% of non-Hispanic Black birthing parents smoked cigarettes during pregnancy.*

13.8% of non-Hispanic Black birthing parents lived with someone who smoked cigarettes at the time of birth.*

18.7% of non-Hispanic Black birthing parents smoked cigarettes during the months following birth.*

(2015–2019)

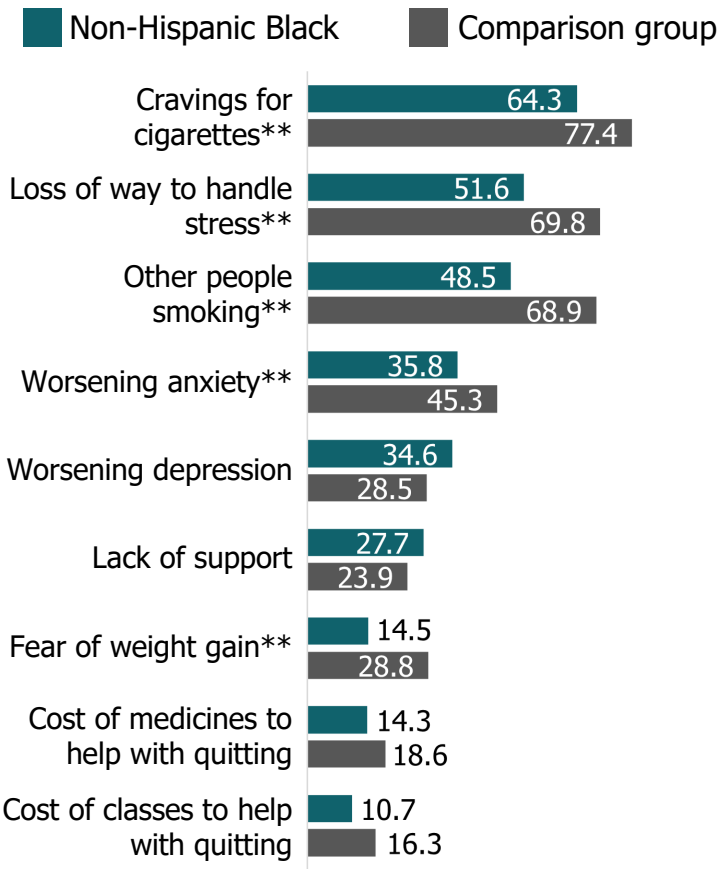
Reducing smoke exposure during pregnancy and after birth can help to reduce the risk of SUID. Non-Hispanic Black birthing parents were more likely to smoke cigarettes during or after pregnancy or live with someone who smoked cigarettes than those in the comparison group.

Among non-Hispanic Black birthing parents who smoked prior to pregnancy, 44.4% of them quit during pregnancy. There was no difference between groups in the proportion who quit during pregnancy. Non-Hispanic Black birthing parents were less or just as likely to report many barriers to quitting smoking cigarettes during pregnancy. The most commonly reported barrier to quitting was cravings for cigarettes. (Note: Questions on barriers do not incorporate intention to quit.)

These data point to the need to focus on reducing cigarette smoking prior to pregnancy. It is also important to ensure people who are pregnant have options to reduce their exposure to secondhand smoke. In order to improve smoking cessation success, it will be important for prevention efforts to focus on barriers to quitting listed to the right.

Percent reported barriers to quitting smoking cigarettes during pregnancy, 2016–2019

Among those who smoked during three months before pregnancy



* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: SUID

Alcohol and substance use during pregnancy and after birth

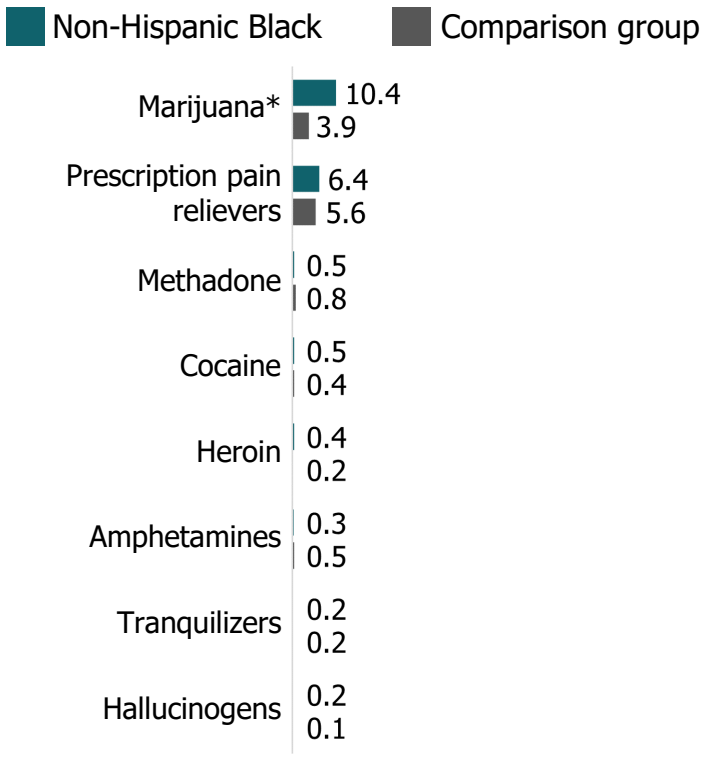
Reducing alcohol consumption and substance use during pregnancy and after birth can help to reduce the risk of SUID. Use during pregnancy may also increase the risk of pregnancy loss, birth defects, low birthweight, and preterm birth.[8]

Overall, substance use during pregnancy was uncommon. However, one in 10 non-Hispanic Black birthing parents reported marijuana use for any reason during pregnancy, greater than reported use for those in the comparison group.

The majority of non-Hispanic Black birthing persons were asked about alcohol or substance use during a prenatal care visit. Prenatal care may provide an opportunity for education or for patients to be connected to treatment, if appropriate. However, to reduce alcohol and substance use during pregnancy, preventive strategies should also be prioritized to address the upstream and root causes of why the individual began using alcohol and substances in the first place. Addressing root causes and systemic factors such as chronic stress, adverse childhood experiences, untreated trauma, financial burdens, and systemic racism—some of which occur years prior to pregnancy—will be critical to improving alcohol and substance use.

Percent reported substance use during pregnancy, 2016–2019

Substance use for any reason



93.5% of non-Hispanic Black birthing parents were asked if they were using alcohol by a health care provider during a prenatal care visit.**

87.0% of non-Hispanic Black birthing parents were asked if they were using substances by a health care provider during a prenatal care visit.*

(2016–2019)

* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: SUID

Breastfeeding or chestfeeding practices

The American Academy of Pediatrics recommends breastfeeding or chestfeeding to reduce the risk of SUID.[6] (Language note: "Breastfeeding" is used throughout the rest of this section to reflect language used in the data collection systems.)

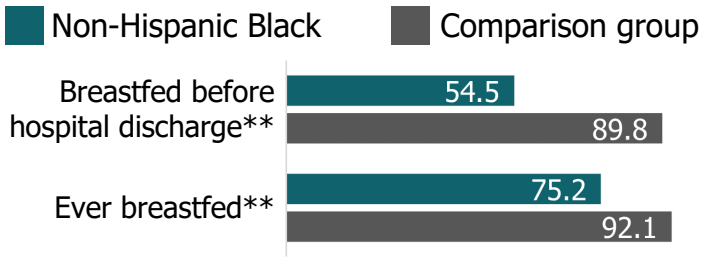
Non-Hispanic Black birthing parents were less likely to breastfeed their infant prior to hospital discharge or at any time.

Hospitals or birthing facilities may help to support feeding practices. Non-Hispanic Black birthing parents are more likely to be provided with a breast or chest pump and formula than those in the comparison group. However, Non-Hispanic Black birthing parents are less likely to be told when to feed their baby or given contact information for a breastfeeding support hotline. Despite the potential for support, non-Hispanic Black birthing parents are less likely to exclusively breastfeed while at the hospital after birth.

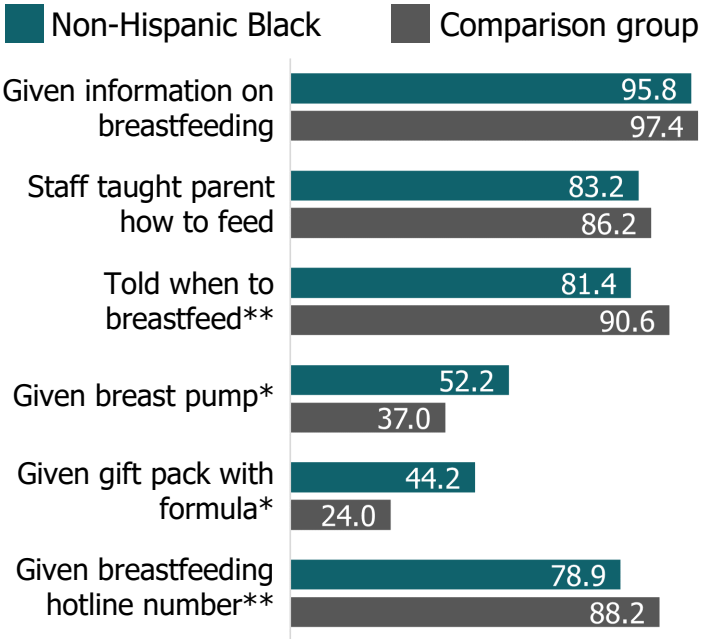
Compared to those in the comparison group, non-Hispanic Black birthing parents were more likely to get information on breastfeeding from their own doctor, the baby's doctor, a feeding support group, or a feeding hotline. Non-Hispanic Black birthing parents were less likely to get information from a nurse, midwife, doula, family, or friends. The most common source of breastfeeding information was their own doctor, with 86.3% receiving information from this source.

These data tell us that strategies for SUID prevention should include breastfeeding support services, including within hospital settings, at home, and at work.

Percent reporting breastfeeding experiences, 2015–2019



Percent who received education or resources from birthing hospital, 2016–2019



* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: SUID

Lack of access to quality and culturally appropriate preconception care

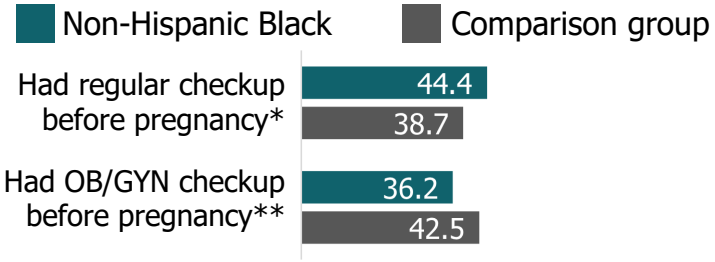
Preconception care, or care that occurs before pregnancy, can help to promote overall health prior to pregnancy. People should be able to not just access preconception care but also receive care that is high-quality and culturally appropriate.

During the year before pregnancy, non-Hispanic Black birthing parents were more likely to have had a regular checkup than those in the comparison group but less likely to have had an obstetrics and gynecology (OB/GYN) checkup. Referrals to OB/GYN care prior to pregnancy may help to improve access to preconception care.

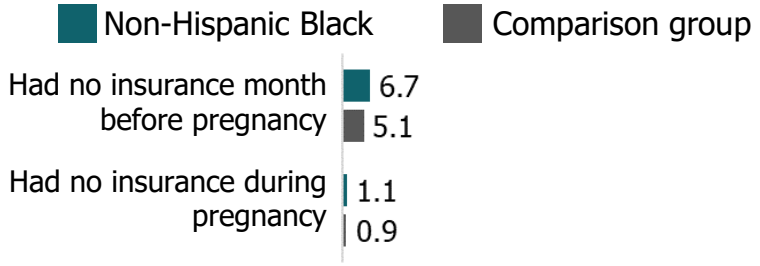
Having health insurance can help facilitate access to health care. There was no significant difference in health insurance coverage between non-Hispanic Black and comparison group birthing parents both before and during pregnancy.

Percent with preconception care, 2016–2019

During year before pregnancy



Percentage without health insurance, 2015–2019



* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: SUID

Lack of access to quality and culturally appropriate prenatal care

61.0% of non-Hispanic Black birthing parents received adequate prenatal care (based on Kotelchuck index of prenatal care adequacy; see Data Notes for further details).**

19.7% of non-Hispanic Black birthing parents did not receive prenatal care as early as they wanted.*

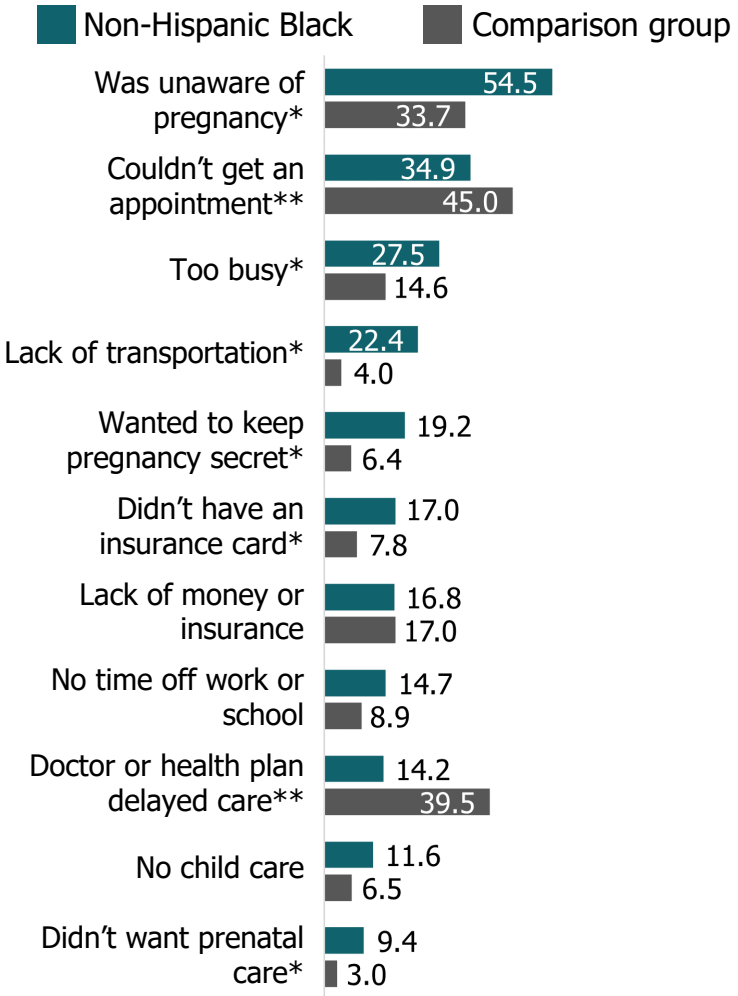
(2015–2019)

Accessing quality prenatal care can help to protect the health of both parent and infant. The first prenatal care appointment should occur during the first trimester along with many subsequent appointments during the pregnancy. Non-Hispanic Black birthing parents were less likely to receive at least an adequate quantity of prenatal care than parents in the comparison group, based on the Kotelchuck classification (see Data Notes).

Almost one in five non-Hispanic Black birthing parents reported not receiving prenatal care as early as they wanted. These parents most commonly reported being unaware of the pregnancy as a barrier to receiving early prenatal care. Compared to the comparison group, they were less likely to report barriers such as ability to get an appointment or systems delaying care and more likely to report barriers such as being too busy, having a lack of transportation, having a desire to keep the pregnancy secret, being without an insurance card, or not wanting prenatal care.

Percent reported barriers to accessing prenatal care, 2016–2019

Among those who did not receive any prenatal care or did not get care as early as they wanted



* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

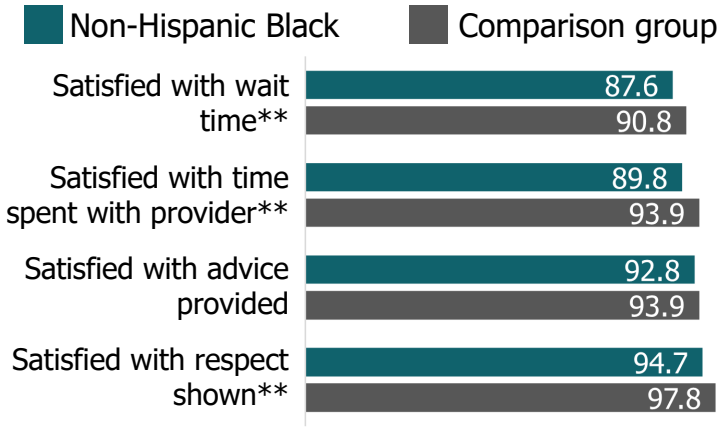
Prevention Area: SUID

Having access to prenatal care is not enough. The prenatal care received needs to be high-quality, patient-centered, and culturally appropriate.

Research from Dr. Sheryl Coley and colleagues found that Black mothers or mothers identifying as Black and another race in Southern Wisconsin valued prenatal care that was personalized to their needs while also being sensitive to experiences of Black communities.[9] Many barriers to quality prenatal care could be addressed with open communication between patients and providers.[9] The study findings also stressed the importance of providers understanding the social and cultural contexts of their patients' lives.[9]

Percent reporting satisfaction with prenatal care, 2015–2019

Among individuals who received prenatal care



Increasing diversity of the health care workforce is a key step to opening communication between patients and providers, thus improving the quality of care. A diverse health care workforce improves health outcomes for everyone, and having a Black physician lowers the risk of mortality among Black infants.[5] Educational institutions should remove obstructions in the physician pipeline for aspiring Black physicians through creation of support systems, outreach to diverse youth, implementation of wholistic medical school admissions policies, and consideration of applicants' understanding of racism and inequities.[5] Financial support is also essential for the recruitment of and retention of diverse students.[5]

From 2015–2019, many non-Hispanic Black birthing parents were satisfied with the prenatal care that they received. However, compared to those in the comparison group, they were less likely to be satisfied with the wait time, amount of time spent with their provider, and the amount of respect shown towards themselves. Both health care systems and insurance providers should be held accountable for these factors. The amount of time a provider spends with a patient is limited by pressures to be productive and increase patient volume. Such practices impact care quality and should be addressed.

* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: SUID

Lack of access to quality and culturally appropriate postpartum care

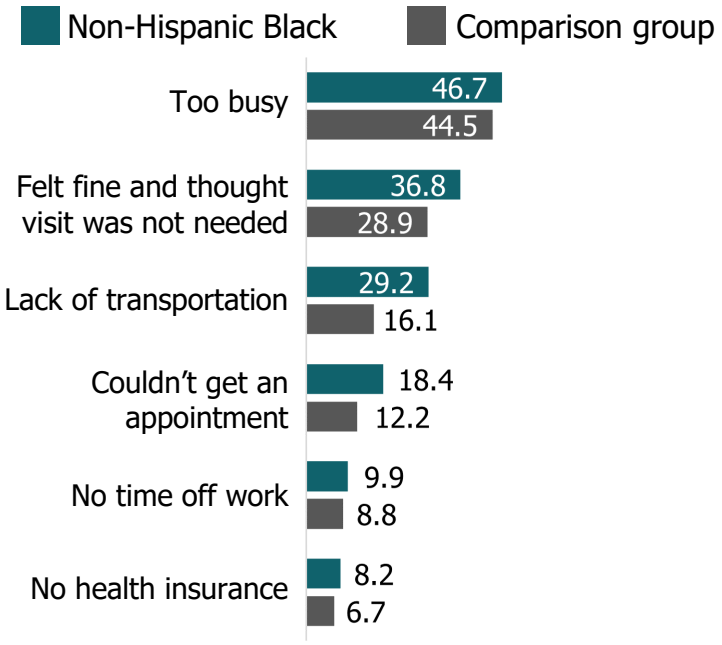
85.3% of non-Hispanic Black birthing parents received postpartum care.**
(2015–2019)

Postpartum care provides an opportunity to promote parent and infant health following birth. Most non-Hispanic Black birthing parents receive postpartum care. However, fewer are able to receive care than parents in the comparison group.

Among non-Hispanic Black birthing parents who did not receive any postpartum care, the most common barriers were being too busy and feeling fine enough to not think care was needed. Some parents reported factors related to social determinants of health (such as lack of transportation, no time off work, or no health insurance) as barriers to receiving postpartum care. Improving access to care may involve the systemic reduction or removal of these reported barriers.

Percent reported barriers to accessing postpartum care, 2016–2019

Among those who did not receive any postpartum care



* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: SUID

Poverty

Experiences of poverty have been identified as a key factor contributing to the racial inequities for SUID. Financial insecurity limits available time and access to the resources needed for infant safety. For example, someone living in poverty may experience difficulties in affording a recommended infant sleep surface or taking time away from work to have a postpartum checkup.

Non-Hispanic Black birthing parents were more likely to be living below the federal poverty level at the time of birth than those in the comparison group. It is critical to ensure that non-Hispanic Black parents have the resources they want and need to care for their children.

64.7%

of non-Hispanic Black birthing parents were living below the federal poverty level at the time of their infant's birth.*

Prematurity and low birthweight

15.0% of non-Hispanic Black infants were born preterm (less than 37 gestational weeks).*

15.4% of non-Hispanic Black infants were born at a low birthweight (less than 2,500 grams or 5 lbs. 8 oz.).*

(2015–2019)

Prematurity and low birthweight have been shown to contribute to the disparities in infant health outcomes, including SUID. Non-Hispanic Black infants are more likely to be born both preterm and at a low birthweight than comparison group infants.

PPOR also identified higher rates of low birthweight as contributing to non-Hispanic Black excess deaths within the Maternal Health/Prematurity period of risk. The following sections describe factors that contribute to this infant health outcome.

* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: Low Birthweight

Reducing low birthweight for non-Hispanic Back babies can help to reduce infant mortality inequities. Low birthweight may have serious and life-threatening health consequences, with infants born below 750 grams at greatest risk. Low birthweight may lead to breathing problems, bleeding in the brain, underdeveloped organs, jaundice, and infections.[10] Later in life, low birthweight may also increase the risk of diabetes, heart disease, high blood pressure, developmental disabilities, and obesity.[10]

In 2018, The Foundation for Black Women's Wellness and the Dane County Health Council partnered to conduct listening sessions with Black residents of Dane County, Wisconsin to identify root causes of low birthweight inequtiies.[11] One of the themes that emerged from the listening sessions was ongoing cycles of toxic stress experienced by Black family systems.[11] Stressors impact Black families regardless of education and income level.[11] The struggle for economic security across generations further perpetuates the toxic cycle of stress.[11] Struggles occur within a context of ongoing institutional racism that impacts Black life and progress.[11]

The March of Dimes lists several clinical and social factors that may increase an individual's risk of having an infant born at low birthweight. These factors include age, chronic health conditions such as high blood pressure or diabetes, infections, low weight gain during pregnancy, smoke exposure, alcohol or substance use, toxic environmental exposures, and domestic violence.[10]

A multi-disciplinary scientific work group was convened by the March of Dimes to review research on Black-white disparities in preterm birth, a common cause of low birthweight.[12] The work group assessed the plausibility of various factors contributing to the disparities. The group identified several upstream factors as being plausible contributors, including racism, neighborhood socioeconomic disadvantage, stressful experiences, and other social determinants of health.[12] Upstream factors often manifest as downstream factors that impact preterm birth. Such downstream factors identified as plausible contributors to Black-white disparities in preterm birth include prenatal care, preconception care, inter-pregnancy intervals, pre-pregnancy diabetes or hypertension, and gestational diabetes or hypertension.[12]

Smoke exposure, alcohol and substance use, preconception care, and prenatal care impact low birthweight, and these factors have been described in previous sections of this report. (Go to page 14 to read more about smoke exposure. Go to page 15 to read more about alcohol and substance use. Go to pages 17–19 to learn more about access to quality and culturally appropriate preconception and prenatal care.) The subsequent sections explore other factors impacting low birthweight for Wisconsin communities.

Photo courtesy of Dr. Jasmine Zapata

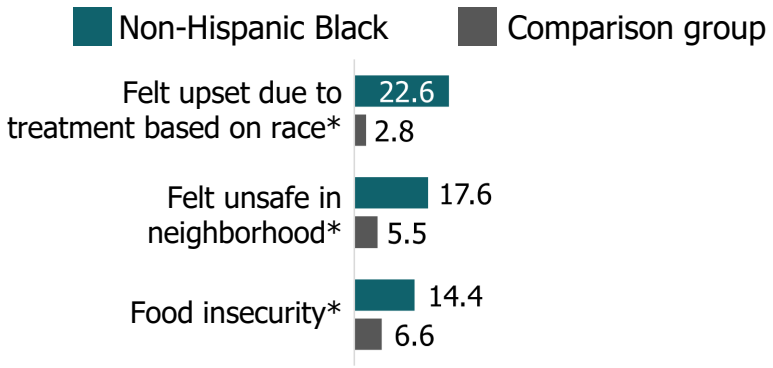
Prevention Area: Low Birthweight

Stressful events and experiences

Stressful events and experiences can increase the risk of low birthweight by impacting hormone levels and leading to preterm birth.[13] Although stress during pregnancy is important, stress that occurs throughout the parent's entire life can also impact birth outcomes. Dr. Michael Lu proposed a life course framework to describe how early and cumulative stressful experiences contribute to racial and ethnic inequities in birth outcomes.[13] Stress and other risk factors occurring during crucial stages of development can impact health outcomes later in life.[13] Risk factors across the lifespan also accumulate to impact health.[13]

Percent experienced adverse social determinants of health, 2015–2019

Experienced during year before birth



Stress may be closely intertwined with social determinants of health, as a person's social experiences can add or reduce stress. Non-Hispanic Black birthing parents were more likely to experience several adverse social determinants of health than parents in the comparison group. Many non-Hispanic Black birthing persons reported feeling upset about how they were treated based on their race, feeling unsafe in their neighborhood, and experiencing food insecurity, all during the year before birth.

Experiences of domestic violence or abuse also contributes to stress. From 2015–2019, about one in 10 non-Hispanic Black birthing parents experienced physical abuse before or during their pregnancy. One in 10 non-Hispanic Black birthing parents experienced emotional or sexual abuse during their pregnancy. Non-Hispanic Black birthing parents were more likely to experience abuse than those in the comparison group. It is essential to provide support for individuals experiencing abuse as well as changing the structures that allow or contribute to abuse in the first place.

11.6% of non-Hispanic Black birthing parents experienced physical abuse before or during pregnancy.*

11.1% of non-Hispanic Black birthing parents experienced emotional or sexual abuse during pregnancy.*

(2015–2019)

* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

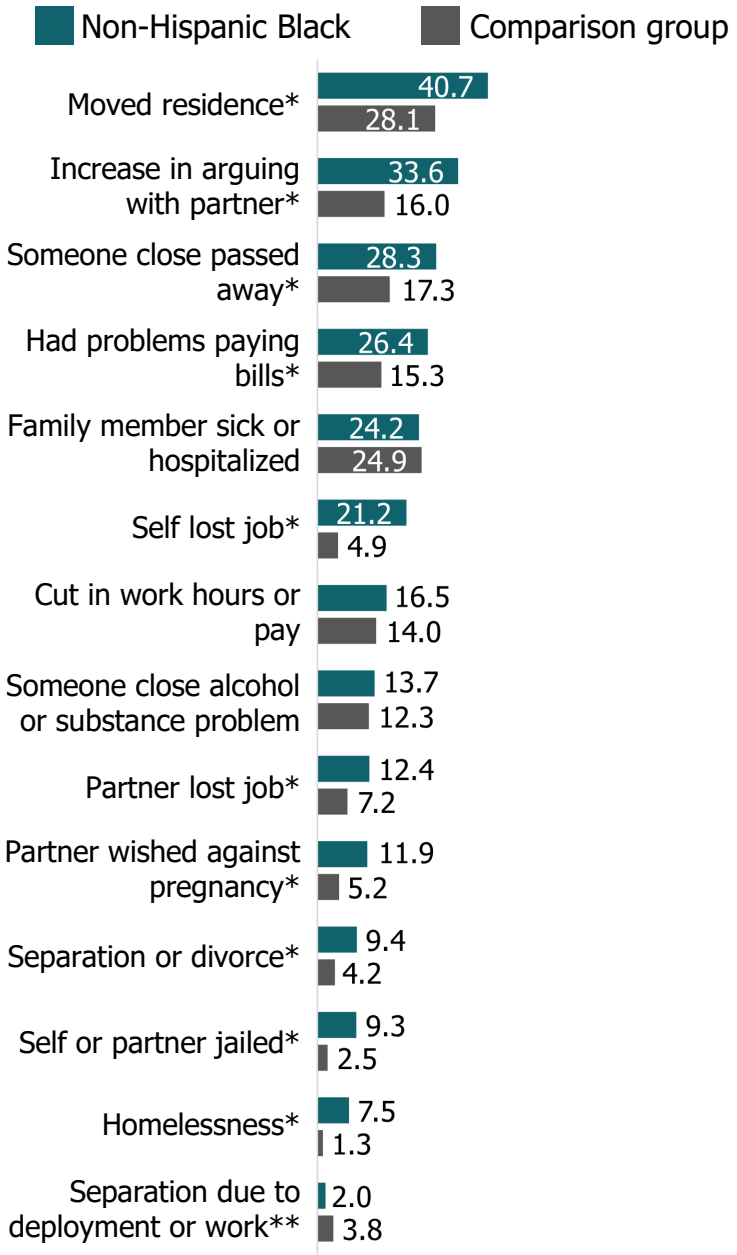
Prevention Area: Low Birthweight

The most commonly reported stressful events during the year before birth among non-Hispanic Black birthing parents were moving residence, increasing arguing with their partner, having someone close to them pass away, and having problems paying bills. Many stressors were more frequently experienced by non-Hispanic Black birthing parents than those in the comparison group.

Aligning with Dr. Lu's life course framework, preventing stressful events and reducing the impacts of stress throughout the lifespan, and especially at crucial points of early development, can help to reduce low birthweight.[13] It is important to address both chronic stressors and those occurring at the time of pregnancy.

Percent experienced stressful events, 2015–2019

During year before birth



* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: Low Birthweight

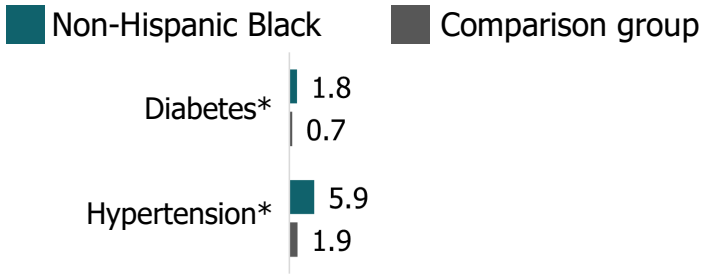
Chronic disease

86.6% of non-Hispanic Black birthing parents reported their general health before pregnancy as being good, very good, or excellent.**

(2015–2019)

Chronic disease may impact birth outcomes, including low birthweight. Prior to pregnancy, the majority of non-Hispanic Black birthing parents said their general health was good, very good, or excellent. Pre-pregnancy diabetes and hypertension were not common for non-Hispanic Black birthing parents; however, they were more common than for the comparison group.

Percent with diagnosis for pre-pregnancy health condition, 2015–2019



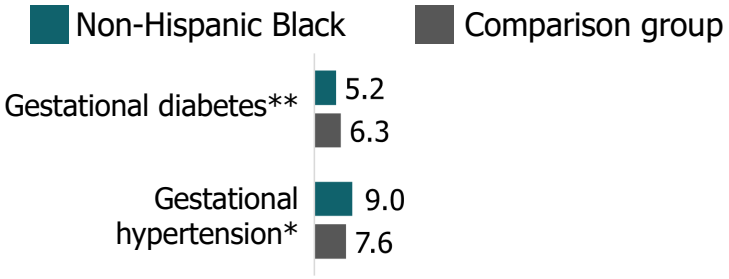
Lifetime stressors and risk factors lead to inequities in chronic disease. To address this, preventive approaches need to be implemented as early as the childhood years. Additionally, trust building with health care systems, elimination of bias in health care, prioritization of strategies to involve more Black people in research studies, health care access, and wealth redistribution are all areas that should receive continued focus in order to eliminate inequities in chronic disease.

Gestational disease

Gestational diabetes and hypertension may also impact birthweight. Overall, these health conditions were not common during pregnancy. Gestational diabetes was diagnosed more among birthing parents in the comparison group while gestational hypertension was diagnosed more among non-Hispanic Black parents.

Although gestational disease is not common, it is important to ensure access to quality and culturally appropriate prenatal care to allow for prevention, diagnosis, and treatment.

Percent diagnosed with gestational health condition, 2015–2019



* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Prevention Area: Low Birthweight

Lack of reproductive autonomy and reproductive justice

37.3% of non-Hispanic Black birthing parents discussed their desire to have or not have children during preconception care.**

(2016–2019)

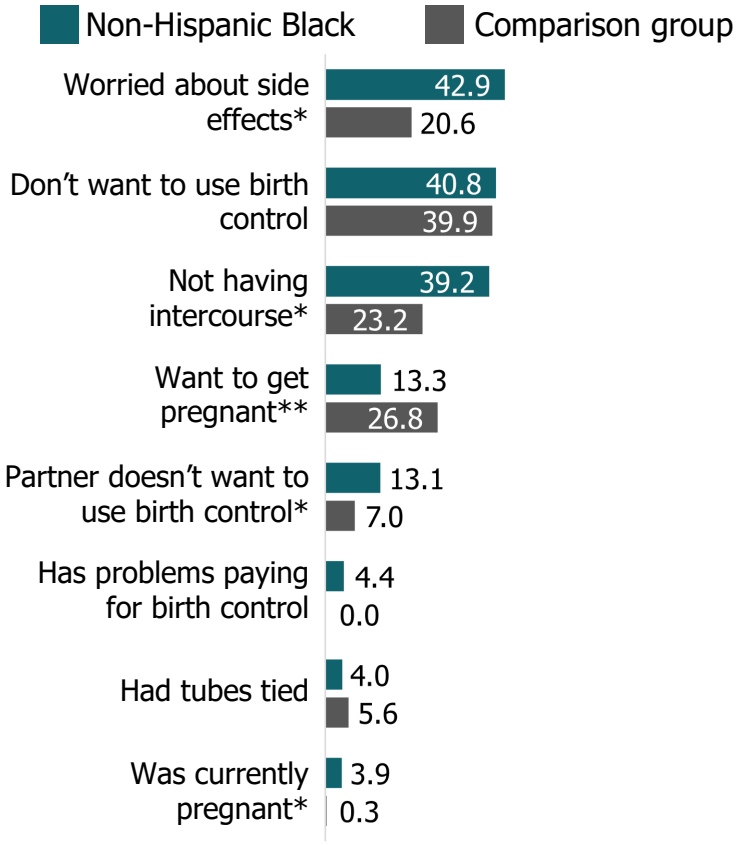
Reproductive justice is a framework that describes distributing power and resources so that everyone has, "the right to have children, to not have children, to parent one's children, and to control one's birthing options."[14] Lack of reproductive justice impacts birthweight through marginalization, stress, reproductive planning, and timing between successive pregnancies.

Among non-Hispanic Black birthing parents who had a health care visit before pregnancy, about one third discussed with their provider their desire to have or not have children. These conversations may help provide patients with the power and resources for reproductive planning. Following pregnancy, one in five non-Hispanic Black birthing parents were not doing anything to prevent a subsequent pregnancy. The most frequently reported reasons for not using birth control following pregnancy were worries about the side effects, not wanting to use birth control, and not having intercourse.

The Black Mamas Matter Alliance outlined how to advance reproductive justice through access to reproductive health care.[14] There should be increased affordability of reproductive health care, improved access to sexual health education, and increased access to legal and safe abortion services.[14] These guidelines should be accomplished through the empowerment of women and promotion of health across all areas and stages of life.[14]

Percent reporting reasons for not using contraception, 2015–2019

During the months following pregnancy, among those who were not preventing pregnancy



* Significantly higher for non-Hispanic Black population at α = 0.05
** Significantly higher for comparison group at α = 0.05

Call to Action

The PPOR analysis helped to identify approaches to reduce inequities in fetal and infant mortality. For the Wisconsin non-Hispanic Black population, the most excess deaths occur within the Infant Mortality period, closely followed by the Maternal Health/Prematurity period. Within the Infant Health period, SUID is the leading cause of excess deaths. Within the Maternal Health/Prematurity period, having higher rates of low birthweight is the leading cause of excess deaths. **Focusing on SUID and low birthweight prevention may help to reduce excess fetal and infant deaths and inequities impacting Black communities in Wisconsin.**

When working to improve health outcomes, it is important to understand how systemic racism and discrimination create health inequities. The data in this report highlight the need to address systemic factors such as the impacts of historical trauma, economic stability, diversity in the health care workforce, early and cumulative stress, and social determinants of health.

We hope these data will be used to further health equity and improve birth outcomes for Black communities in Wisconsin. Together, we can work towards lowering the rate of loss, so all families experience a healthy birth outcome, and our babies have a happy healthy first birthday.

Grief support and bereavement resources

The contents of this report can be emotionally heavy. Information about grief support and bereavement resources is available through the Maternal and Infant Mortality Related Resources and Data webpage.

Citations

1. Forbes, C. (2020, July 7). How Do We Address Black Grief, Compounded by Centuries of Racism, Loss and Trauma? *Baby 1st Network*.
2. Perinatal Periods of Risk Approach. (2021, September 8). *CityMatCH*. https://www.citymatch.org/perinatal-periods-of-risk-approach/
3. Brave Heart, M. Y. H. (2003). The historical trauma response among natives and its relationship with substance abuse: A Lakota illustration. *Journal of Psychoactive Drugs*, *35*(1), 7–13. https://doi.org/10.1080/02791072.2003.10399988
4. Geronimus, A. T., Hicken, M., Keene, D., & Bound, J. (2006). "Weathering" and age patterns of allostatic load scores among blacks and whites in the United States. *American Journal of Public Health*, *96*(5), 826–833. https://doi.org/10.2105/AJPH.2004.060749
5. Green, T. L., Zapata, J. Y., Brown, H. W., & Hagiwara, N. (2021). Rethinking Bias to Achieve Maternal Health Equity. *Obstetrics & Gynecology*, *137*(5), 6. https://doi.org/10.1097/AOG.0000000000004363
6. Moon, R. Y., Carlin, R. F., & Hand, I. (2022). Sleep-Related Infant Deaths: Updated 2022 Recommendations for Reducing Infant Deaths in the Sleep Environment. *American Academy of Pediatrics*, *150*(1), 22. https://doi.org/10.1542/peds.2022-057990
7. *Targeting Sudden Infant Death Syndrome (SIDS): A Strategic Plan* (p. 1-43). (2001). National Institute of Child Health and Human Development.
8. Tobacco, Alcohol, Drugs, and Pregnancy Frequently Asked Questions. (2021, December). *American College of Obstetricians and Gynecologists*.
9. Coley, S. L., Zapata, J. Y., Schwei, R. J., Mihalovic, G. E., Matabele, M. N., Jacobs, E. A., & Anderson, C. K. (2018). More than a "Number": Perspectives of Prenatal Care Quality from Mothers of Color and Providers. *Womens Health Issues*, *28*(2), 16. https://doi.org/10.1016/j.whi.2017.10.014
10. Low Birthweight. (2021, June). *March of Dimes*. https://www.marchofdimes.org/complications/low-birthweight.aspx
11. *Saving Our Babies Low Birthweight Engagement Final Report: Advancing Black Maternal, Child & Family Well-Being in Dane County to Improve Birth Outcomes* (p. 1-64). (2019). The Foundation for Black Women's Wellness.
12. Braveman, P. (2021). Explaining the Black-White Disparity in Preterm Birth: A Consensus Statement From a Multi-Disciplinary Scientific Work Group Convened by the March of Dimes. *Frontiers in Reproductive Health*, *3*, 1–24. https://doi.org/10.3389/frph.2021.684207
13. Lu, M. C., & Halfon, N. (2003). Racial and Ethnic Disparities in Birth Outcomes: A Life-Course Perspective. *Maternal and Child Health Journal*, *7*(1), 13–30.
14. *Black Mamas Matter: Advancing the Human Right to Safe and Restpectful Maternal Health Care* (pp. 1–92). (2018). Black Mamas Matter Alliance.
15. Kotelchuck, M. (1994). An Evaluation of the Kessner Adequacy of Prenatal Care Index and a Proposed Adequacy of Prenatal Care Utilization Index. *American Journal of Public Health*, *84*(9), 7. https://doi.org/10.2105/ajph.84.9.1414.

Appendix

Acronyms

AAP	American Academy of Pediatrics
CDC	Centers for Disease Control and Prevention
CSTE	Council of State and Territorial Epidemiologists
ICD-10	International Classification of Diseases 10th Revision
NICU	Neonatal intensive care unit
OB/GYN	Obstetrics and gynecology
PCOS	Polycystic ovary syndrome
PPOR	Perinatal Periods of Risk
PRAMS	Pregnancy Risk Assessment Monitoring System
SIDS	Sudden Infant Death Syndrome
SUID	Sudden Unexpected Infant Death

Definitions

Low birthweight: weight at birth less than 2,500 grams (5 lbs. 8 oz.)

Very low birthweight: weight at birth less than 1,500 grams (3 lbs. 5 oz.)

Preterm: born before age 37 gestational weeks

Birthing person: a person with the ability to become pregnant and give birth

Birthing parent: a parent who gave birth to an infant

Appendix

Data notes

Criteria for populations: All births, fetal deaths, and infant deaths included in the analysis required Wisconsin residence for the parent that gave birth at the time of birth, non-missing gestational age of 24 weeks or higher, non-missing birthweight of 500 grams or higher, and a plausible combination of gestational age and birthweight. Non-plausible combinations were as follows:

- Gestational age < 20 weeks and birthweight ≥ 500 grams
- 20 weeks ≤ gestational age < 24 weeks and birthweight ≥ 2,000 grams
- 24 weeks ≤ gestational age < 28 weeks and birthweight ≥ 3,000 grams
- 28 weeks ≤ gestational age < 32 weeks and birthweight ≥ 4,000 grams
- 32 weeks ≤ gestational age < 47 weeks and birthweight < 1,000 grams and plurality = 1

Race and ethnicity for each birth, fetal death, and infant death was assigned based upon the self-identified race and ethnicity of the parent that gave birth. The non-Hispanic Black population did not include those who identified as more than one race.

The comparison group consisted of births, fetal deaths, and infant deaths born to parents who self-identified as non-Hispanic white, were age 20 years or older at time of birth, and had 13 or more years of education at time of birth. The comparison group did not include those who identified as more than one race.

Sample size considerations: For the PPOR framework, CityMatCH suggests minimum sample sizes needed to conduct sound analyses.[2] For the Phase I analysis, the recommended sample size for each population is a total of at least 60 fetal and infant deaths, with at least 10 deaths occurring in each period of risk. This sample size suggestion was met.

For the Phase II analysis for the Infant Health period, the recommended sample size for each population is 20 deaths per cause of death category. This sample size suggestion was not met for both the non-Hispanic Black population and reference group for cause of death categories with the lowest rates. Caution should be exercised when interpreting estimates for the cause of death categories with the lowest rates.

For the Phase II analysis for the Maternal Health/Prematurity period, the recommended sample size for each population is 20 deaths per birthweight grouping. This sample size suggestion was met.

Appendix

Cause of death categories for Infant Health period Phase II analysis: The ICD-10 codes used for categorizing cause of death correspond to the underlying cause of death. The underlying cause of death refers to the disease or condition that initiated events resulting in a death. Categorization was based upon guidance from CityMatCH.[2]

Cause of death category	ICD-10 codes for underlying cause of death
SUID	R95, R99, W75, W84
Infections	A00–A32, A34–A99, B00–B99, G00–G09, H00, H03, H10.0, H10.1, H10.2, H10.3, H44.0, H44.1, H60, H62.0, H62.1, H62.2, H62.3, H62.4, H66, H67, H70, H95.0, H95.1, I30, I33, I40, I41, J00–J06, J10–J22, J36, J39.0, J39.1, J40, J85, J86, K61, K65, K67, K75.0, K75.1, K77.0, K85, L01–L08, L98.0, L98.3, M00, M02, M03, M60.0, M86, M90.0, M90.1, M90.2, N10, N11, N12, N13.6, N15.1, N30.0, P00.1, P00.2, P00.8, P02.7, P36, P39.9
Injuries	V01–V99, W00–W74, W76–W83, W84–W99, X00–X99, Y00–Y89
Birth defects	Q00–Q99
Perinatal conditions	A33, G93.1, I61, P01.0, P01.1, P01.5, P02.0, P02.1, P02.2, P07.0, P07.1, P07.2, P07.3, P10.0, P10.1, P10.2, P10.4, P10.9, P20.9, P21.0, P21.9, P22.0, P22.8, P22.9, P25, P26, P27, P28.0, P28.1, P28.2, P28.3, P28.4, P28.5, P28.6, P28.7, P28.8, P28.9, P29.0, P29.1, P52.0, P52.1, P52.2, P52.3, P52.9, P77, P96.8
Other causes	All other ICD-10 codes

Kitagawa analysis: A Kitagawa analysis was used during Phase II for the Maternal Health/ Prematurity period to determine the contribution of birthweight distribution and birthweight-specific mortality rates toward fetal and infant deaths within this period. The formula was adapted to calculate the magnitude of contribution from these two factors.[2]

The magnitude of contribution of birthweight distribution to increased deaths among Population 1 compared to Population 2 at a given birthweight range (i) where C_{1i} is the birthweight-specific mortality rate for Population 1 at birthweight range i, C_{2i} is the birthweight-specific mortality rate for Population 2 at birthweight range i, P_{1i} is the proportion of Population 1 within the birthweight range i, and P_{2i} is the proportion of Population 2 within the birthweight range i is:

$$\left[\frac{(C_{2i} + C_{1i})}{2} \times (P_{2i} - P_{1i})\right]$$

Appendix

The magnitude of contribution of birthweight-specific mortality rates at a given birthweight range (i) where C_{1i} is the birthweight-specific mortality rate for Population 1 at birthweight range i, C_{2i} is the birthweight-specific mortality rate for Population 2 at birthweight range i, P_{1i} is the proportion of Population 1 within the birthweight range i, and P_{2i} is the proportion of Population 2 within the birthweight range i is:

$$\left[\frac{(P_{2i} + P_{1i})}{2} \times (C_{2i} - C_{1i})\right]$$

Kotelchuck index of prenatal care adequacy: The Kotelchuck index classifies prenatal care adequacy based on both when prenatal care began and if the number of prenatal care visits aligns with recommendations from the American College of Obstetricians and Gynecologists.[15] The index measures quantity and not quality of prenatal care.

Kotelchuck index classification	**Initiation of prenatal care**		**Number of received services**
Adequate plus	Prenatal care began by the end of the 4th month of pregnancy	*and*	110% or more recommended visits received
Adequate	Prenatal care began by the end of the 4th month of pregnancy	*and*	80–109% recommended visits received
Intermediate	Prenatal care began by the end of the 4th month of pregnancy	*and*	50–79% recommended visits received
Inadequate	Prenatal care began after the 4th month of pregnancy	*or*	Less than 50% recommended visits received
None	No prenatal care		No prenatal care

Appendix

Data tables

Infant mortality rate per 1,000 live births among Wisconsin residents, 2000–2020
By self-identified race and ethnicity of the parent that gave birth
Data source: Wisconsin Linked Birth/Infant Death File

Year	Wisconsin statewide	Non-Hispanic Black
	Rate (per 1,000 live births)	Rate (per 1,000 live births)
2000–2002	6.9	17.9
2001–2003	6.8	17.4
2002–2004	6.4	17.6
2003–2005	6.3	16.5
2004–2006	6.3	17.0
2005–2007	6.4	15.4
2006–2008	6.5	14.9
2007–2009	6.4	13.9
2008–2010	6.2	13.6
2009–2011	5.9	13.6
2010–2012	5.9	13.5
2011–2013	6.0	14.3
2012–2014	5.8	13.8
2013–2015	5.8	14.1
2014–2016	5.9	13.8
2015–2017	6.1	14.9
2016–2018	6.2	14.5
2017–2019	6.1	13.6
2018–2020	6.0	13.1

Percent of infant deaths attributable to leading causes of infant death among Wisconsin residents, 2015–2019
By self-identified race and ethnicity of the parent that gave birth
Data source: Wisconsin Linked Birth/Infant Death File

Cause of death	Wisconsin statewide	Non-Hispanic Black
	Percent	Percent
Birth defects	20.5	12.3
Short gestation or low birthweight	19.5	21.7
Maternal pregnancy complications	5.6	5.2
Unintentional injuries	5.1	5.0
Placenta, cord, or membrane causes	4.0	5.0
Other causes	45.3	50.8

Appendix

Fetal and infant mortality rates for each perinatal period of risk among Wisconsin residents, 2015–2019
Per 1,000 live births and fetal deaths
Data source: Wisconsin Birth File; Wisconsin Fetal Death File; Wisconsin Linked Birth/Infant Death File

Perinatal period of risk	Non-Hispanic Black	Comparison group[a]
	Rate (per 1,000 births and fetal deaths)	Rate (per 1,000 births and fetal deaths)
Total rate[b]	13.7	4.7
Maternal Health/Prematurity	5.0	1.7
Maternal Care	2.7	1.2
Newborn Care	1.6	0.9
Infant Health	4.4	0.8

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth
[b]Excludes deaths with birthweight < 500 grams or gestational age < 24 weeks

Excess mortality rates and deaths for each perinatal period of risk among non-Hispanic Black Wisconsin residents, 2015–2019
In excess of deaths experienced by comparison group[a]; fetal and infant mortality rates per 1,000 live births and fetal deaths
Data source: Wisconsin Birth File; Wisconsin Fetal Death File; Wisconsin Linked Birth/Infant Death File

Perinatal period of risk	Excess rate (per 1,000 births and fetal deaths)	Excess number of deaths
Total[b]	9.0	299
Maternal Health/Prematurity	3.3	109
Maternal Care	1.5	48
Newborn Care	0.7	23
Infant Health	3.6	119

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth
[b]Excludes deaths with birthweight < 500 grams or gestational age < 24 weeks

Infant mortality rates within the Infant Health period by population and cause of death, 2015–2019
Among Wisconsin residents; per 1,000 live births ≥ 1,500 grams and surviving ≥ 28 days
Data source: Wisconsin Birth File; Wisconsin Linked Birth/Infant Death File

Cause of death category[b]	Non-Hispanic Black	Comparison group[a]
	Rate (per 1,000 births and fetal deaths)	Rate (per 1,000 births and fetal deaths)
Sudden unexpected infant death (SUID)	2.6	0.3
Infections	0.5	0.1
Injuries	0.4	0.1
Birth defects	0.5	0.2
Perinatal conditions	0.1	0.0
Other causes	0.5	0.2

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth
[b]Category definitions can be found in the Data Notes section

Appendix

Excess mortality rates and deaths within the Infant Health period for each cause of death category among non-Hispanic Black infants, 2015–2019

Among Wisconsin residents; in excess of deaths experienced by comparison group[a]; infant mortality rate per 1,000 live births with birthweight ≥ 1,500 grams and surviving ≥ 28 days

Data source: Wisconsin Birth File; Wisconsin Linked Birth/Infant Death File

Cause of death category[b]	Excess rate (per 1,000 births ≥ 1,500 grams and surviving ≥ 28 days)	Excess number of deaths
Sudden unexpected infant death (SUID)	2.3	72
Infections	0.4	14
Injuries	0.4	11
Birth defects	0.4	11
Perinatal conditions	0.1	2
Other causes	0.3	9

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]Category definitions can be found in the Data Notes section

Birthweight distribution within the Maternal Health/Prematurity period by population, 2015–2019

Among Wisconsin residents; percent of live births and fetal deaths that fall within birthweight groupings

Data source: Wisconsin Birth File; Wisconsin Fetal Death File; Wisconsin Linked Birth/Infant Death File

Birthweight grouping (grams)	Non-Hispanic Black	Comparison group[a]
	Percent within birthweight grouping	Percent within birthweight grouping
500–749	0.7	0.2
750–999	0.6	0.2
1,000–1,249	0.7	0.2
1,250–1,499	0.8	0.3

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

Birthweight-specific fetal and infant mortality rates within the Maternal Health/Prematurity period by population, 2015–2019

Among Wisconsin residents; fetal and infant mortality rate per 1,000 live births and fetal deaths

Data source: Wisconsin Birth File; Wisconsin Fetal Death File; Wisconsin Linked Birth/Infant Death File

Birthweight grouping (grams)	Non-Hispanic Black	Comparison group[a]
	Rate (per 1,000 births and fetal deaths)	Rate (per 1,000 births and fetal deaths)
500–749	0.3	0.5
750–999	0.2	0.2
1,000–1,249	0.1	0.1
1,250–1,499	0.1	0.1

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

Appendix

Contribution of rates of low birthweight versus birthweight-specific mortality rates to excess deaths within the Maternal Health/Prematurity period among non-Hispanic Black infants, 2015–2019

Among Wisconsin residents; in excess of deaths experienced by comparison group[a]

Data source: Wisconsin Birth File; Wisconsin Fetal Death File; Wisconsin Linked Birth/Infant Death File

Contributing factor	Birthweight grouping (grams)	Magnitude of contribution[b]
Rates of low birthweight	500–749	2.14
	750–999	0.87
	1,000–1,249	0.56
	1,250–1,499	0.42
Birthweight-specific mortality rates	500–749	-0.74
	750–999	-0.05
	1,000–1,249	-0.03
	1,250–1,499	0.12

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]Magnitude of contribution for rates of low birthweight were calculated as the average birthweight-specific mortality rate between populations multiplied by the difference in birthweight rates between populations. Magnitude of contribution for mortality rates were calculated as the average rate of birthweight between population multiplied by the difference in birthweight-specific mortality rates between populations. A negative contribution means that the factor does not contribute to excess deaths within the birthweight grouping.

Percent of Wisconsin birthing parents who reported using select safe sleep practices by population, 2015–2019

Among parents whose infant was home from the birthing hospital

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Baby most often placed to sleep on back only	72.8	(70.7–74.9)	90.2	(88.6–91.8)
Baby always slept alone in their crib or bed during past two weeks[c]	53.0	(50.3–55.7)	67.9	(65.1–70.7)
Baby crib or bed was placed in the same room where parents slept[c]	91.3	(89.8–92.9)	68.4	(65.6–71.2)
Baby usually slept in a crib, bassinet, or pack and play during past two weeks[c]	90.4	(88.8–92.0)	92.5	(91.0–94.1)
Baby usually slept in a sleeping sack or wearable blanket during past two weeks[c]	26.4	(24.0–28.7)	51.9	(48.9–54.9)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

[c]Data only available from 2016–2019

Appendix

Percent of Wisconsin birthing parents who reported using select unsafe sleep practices by population, 2016–2019

Among parents whose infant was home from the birthing hospital

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Baby usually slept on twin or larger mattress or bed during past two weeks	33.6	(31.0–36.1)	15.8	(13.6–18.0)
Baby usually slept on couch, sofa, or armchair during past two weeks	10.9	(9.3–12.6)	6.8	(5.2–8.3)
Baby usually slept in infant car seat or swing during past two weeks	42.0	(39.3–44.6)	48.8	(45.8–51.8)
Baby usually slept with blanket during past two weeks	51.0	(48.3–53.8)	37.3	(34.4–40.3)
Baby usually slept with toys, cushions, or pillows (including nursing pillows) during past two weeks	7.2	(5.8–8.5)	5.9	(4.5–7.4)
Baby usually slept with mesh or non-mesh crib bumper pads during past two weeks	11.7	(10.0–13.4)	12.0	(10.0–13.9)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who received infant sleep advice from a doctor, nurse, or other health care worker by population, 2016–2019

Among parents whose infant was home from the birthing hospital

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Told to place baby on back to sleep	96.5	(95.6–97.5)	97.3	(96.3–98.3)
Told to place baby in crib, bassinet, or pack and play	96.4	(95.4–97.3)	92.0	(90.3–93.6)
Told to place baby's crib or bed in room with parents	63.3	(60.7–65.9)	53.2	(50.3–56.1)
Told what things should and should not go in bed with baby	94.4	(93.2–95.6)	88.9	(87.0–90.8)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents who reported cigarette smoke exposure during pregnancy by population, 2015–2019

Data source: Wisconsin Birth File

	Non-Hispanic Black		Comparison group[a]	
	Percent	95% C.I.[b]	Percent	95% C.I.[b]
Smoked cigarettes at any time during pregnancy	12.3	(12.0–12.7)	5.7	(5.6–5.8)
Lived with someone who smoked cigarettes at time of birth	13.8	(13.4–14.2)	8.3	(8.2–8.4)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who reported cigarette smoke exposure following birth by population, 2015–2019

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Smoked cigarettes during months following birth	18.7	(17.0–20.5)	12.1	(10.2–13.9)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who quit smoking cigarettes during pregnancy by population, 2015–2019

Among parents who smoked during the three months before pregnancy

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Quit smoking cigarettes during pregnancy	44.4	(39.9–49.0)	46.0	(39.4–52.6)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents who reported barriers that made it hard to quit smoking cigarettes during pregnancy by population, 2016–2019

Among parents who smoked during the three months before pregnancy

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Cravings for cigarettes	64.3	(59.0–69.5)	77.4	(70.9–83.8)
Loss of way to handle stress	51.6	(46.1–57.0)	69.8	(62.7–76.9)
Other people around smoking	48.5	(43.1–53.9)	68.9	(61.8–76.0)
Worsening anxiety	35.8	(30.7–41.0)	45.3	(37.5–53.1)
Worsening depression	34.6	(29.4–39.7)	28.5	(21.3–35.7)
Lack of support from others to quit	27.7	(22.8–32.6)	23.9	(17.4–30.4)
Fear of gaining weight	14.5	(10.8–18.2)	28.8	(21.8–35.8)
Cost of medicines or products to help with quitting	14.3	(10.7–17.8)	18.6	(12.4–24.7)
Cost of classes to help with quitting	10.7	(7.6–13.8)	16.3	(10.4–22.1)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who used substances during pregnancy by population, 2016–2019

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Prescription pain relievers	6.4	(5.2–7.7)	5.6	(4.2–7.0)
Marijuana or hash	10.4	(8.8–12.0)	3.9	(2.6–5.1)
Methadone, naloxone, subutex, or Suboxone	0.5	(0.1–0.8)	0.8	(0.2–1.4)
Heroin	0.4	(0.0–0.7)	0.2	(0.0–0.5)
Amphetamines	0.3	(0.0–0.7)	0.5	(0.1–0.9)
Cocaine	0.5	(0.1–0.9)	0.4	(0.0–0.9)
Tranquilizers	0.2	(0.0–0.5)	0.2	(0.0–0.6)
Hallucinogens	0.2	(0.0–0.4)	0.1	(0.0–0.4)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents who were asked about substance use by a health care worker during prenatal care by population, 2016–2019

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Asked if drinking alcohol	93.5	(92.3–94.8)	97.1	(96.1–98.2)
Asked if using substances such as marijuana, cocaine, crack, or meth	87.0	(85.3–88.7)	80.4	(78.1–82.7)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who breastfed or chestfed before discharge from birthing hospital by population, 2015–2019

Data source: Wisconsin Birth File

	Non-Hispanic Black		Comparison group[a]	
	Percent	95% C.I.[b]	Percent	95% C.I.[b]
Breastfed or chestfed or pumped and fed before discharge from birthing hospital (including if supplemented with formula)	54.5	(53.1–55.1)	89.8	(89.7–90.0)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who ever breastfed by population, 2015–2019

Among parents whose baby was living with them during the months following birth

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Ever breastfed or pumped breast milk to feed baby (even for a short period of time)	75.2	(73.2–77.2)	92.1	(91.6–93.6)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents who received education or resources while at birthing hospital by population, 2016–2019

Among parents whose baby was born in a hospital, ever breastfed, and living with them during the months following birth

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Hospital staff gave information about breastfeeding	95.8	(94.5–97.1)	97.4	(96.3–98.4)
Hospital staff helped parent learn how to breastfeed	83.2	(80.9–85.6)	86.2	(83.9–88.4)
Hospital staff told parent to breastfeed whenever baby wanted	81.4	(79.0–83.8)	90.6	(88.8–92.4)
Hospital gave a breast pump to use	52.2	(49.1–55.3)	37.0	(34.0–40.0)
Hospital gave a gift pack with formula	44.2	(41.1–47.3)	24.0	(21.3–26.6)
Hospital gave a telephone number to call for help with breastfeeding	78.9	(76.4–81.5)	88.2	(86.1–90.2)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who received information about breastfeeding from select sources by population, 2016–2019

Among parents whose baby was living with them during the months following birth

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Their doctor	86.3	(84.5–88.2)	89.8	(77.5–82.2)
A nurse, midwife, or doula	74.7	(72.4–77.0)	79.2	(76.8–81.6)
A breastfeeding or lactation specialist	72.7	(70.3–75.1)	75.8	(73.2–78.4)
Baby's doctor or health care provider	76.0	(73.7–78.3)	70.2	(67.5–73.0)
Breastfeeding support group	29.9	(27.4–32.4)	20.6	(18.1–23.0)
Breastfeeding hotline or toll-free number	13.2	(11.4–15.1)	7.2	(5.6–8.7)
Family or friends	57.8	(55.2–60.5)	66.1	(63.3–68.9)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents who had select health care visits before pregnancy by population, 2016–2019

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Had a regular checkup at family doctor's office	44.4	(41.9–47.0)	38.7	(35.9–41.6)
Had checkup at OB/GYN's office	36.2	(33.8–38.7)	42.5	(39.6–45.4)

OB/GYN = Obstetrician and gynecologist

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who had no health insurance before and during pregnancy by population, 2015–2019

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
No health insurance during month before pregnancy	6.7	(5.6–7.8)	5.1	(3.9–6.4)
No health insurance for prenatal care[c]	1.1	(0.6–1.5)	0.9	(0.3–1.4)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

[c]Among those who had prenatal care

Percent of Wisconsin birthing parents who received adequate prenatal care by population, 2015–2019

Prenatal care adequacy based upon Kotelchuck index, see Data Notes for more information

Data source: Wisconsin Birth File

	Non-Hispanic Black		Comparison group[a]	
	Percent	95% C.I.[b]	Percent	95% C.I.[b]
Adequate plus	33.8	(33.3–34.4)	48.0	(47.8–48.2)
Adequate	27.1	(26.7–27.6)	40.6	(40.4–40.8)
Intermediate	8.7	(8.4–9.0)	3.1	(3.0–3.2)
Inadequate	28.3	(27.9–28.8)	8.1	(8.0–8.2)
None	2.0	(1.9–2.2)	0.2	(0.2–0.2)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents who did not get prenatal care as early as they wanted by population, 2015–2019

Among parents who got prenatal care

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Did not get prenatal care as early as wanted	19.7	(17.9–21.5)	11.1	(9.4–12.8)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who reported barriers that kept them from getting prenatal care when they wanted by population, 2015–2019

Among parents who got no prenatal care or got care later than they wanted

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Didn't know that they were pregnant	54.5	(49.5–59.6)	33.7	(25.5–42.0)
Couldn't get appointment when wanted	34.9	(30.0–39.8)	45.0	(36.5–53.5)
Had too many other things going on	27.5	(22.9–32.1)	14.6	(8.3–20.9)
Didn't have any transportation to get to the clinic or doctor's office	22.4	(18.0–26.9)	4.0	(0.7–7.2)
Didn't want anyone else to know about pregnancy	19.2	(15.1–23.2)	6.4	(2.0–10.8)
Didn't have Medicaid or BadgerCare Plus (ForwardHealth) card	17.0	(13.0–20.9)	7.8	(3.1–12.5)
Didn't have enough money or insurance to pay for visits	16.8	(13.0–20.6)	17.0	(10.6–23.3)
Couldn't take time off from work or school	14.7	(11.0–18.4)	8.9	(3.9–13.9)
Doctor or health plan would not start care as early as wanted	14.2	(10.7–17.8)	39.5	(31.4–47.6)
Didn't have anyone to take care of children	11.6	(8.1–15.0)	6.5	(2.2–10.9)
Didn't want prenatal care	9.4	(6.4–12.5)	3.0	(0.1–6.0)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents who were satisfied with aspects of the prenatal care they got by population, 2015–2019

Among parents who got prenatal care

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Satisfied with wait time	87.6	(86.1–89.1)	90.8	(89.3–92.4)
Satisfied with the amount of time spent with the doctor, nurse, or midwife	89.8	(88.4–91.2)	93.9	(92.7–95.2)
Satisfied with the advice on how to take care of self	92.8	(91.6–93.9)	93.9	(92.6–95.2)
Satisfied with the understanding and respect shown toward them as a person	94.7	(93.7–95.8)	97.8	(97.1–98.6)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who had a postpartum checkup by population, 2015–2019

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Had postpartum checkup 4–6 weeks after birth	85.3	(83.7–87.0)	95.2	(94.0–96.4)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who reported barriers that kept them from having a postpartum checkup by population, 2016–2019

Among parents who did not have a postpartum checkup

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Had too many things going on	46.7	(39.7–537)	44.5	(30.4–58.6)
Felt fine and did not think visit was needed	36.8	(29.9–43.7)	28.9	(16.4–41.4)
Didn't have any transportation to get to clinic or doctor's office	29.2	(22.6–35.8)	16.1	(5.1–27.1)
Couldn't get an appointment when wanted	18.4	(12.9–24.0)	12.2	(2.7–21.7)
Couldn't take time off from work	9.9	(5.9–13.9)	8.8	(1.4–16.3)
Didn't have health insurance to cover the cost of the visit	8.2	(4.4–12.0)	6.7	(0.1–13.3)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents were living below the federal poverty level at the time of birth by population, 2015–2019

Federal Poverty Level based on year of birth, family size, and annual income

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Living below federal poverty level at time of birth	64.7	(62.4–66.9)	16.0	(13.9–18.1)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin born preterm by population, 2015–2019

Data source: Wisconsin Birth File

	Non-Hispanic Black		Comparison group[a]	
	Percent	95% C.I.[b]	Percent	95% C.I.[b]
Born preterm (< 37 gestational weeks)	15.0	(14.7–15.4)	8.7	(8.6–8.8)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin born at a low birthweight by population, 2015–2019

Data source: Wisconsin Birth File

	Non-Hispanic Black		Comparison group[a]	
	Percent	95% C.I.[b]	Percent	95% C.I.[b]
Born at low birthweight (< 2,500 grams)	15.4	(15.0–15.8)	5.9	(5.7–6.0)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who experienced adverse social determinants of health during the year before birth by population, 2015–2019

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Felt upset as a result of how they were treated based on their race	22.6	(20.7–24.5)	2.8	(1.9–3.8)
Always, often, or sometimes felt unsafe in the neighborhood where they lived	17.6	(15.8–19.3)	5.5	(4.3–6.7)
Ate less than they felt they should because there wasn't enough money to buy food[c]	14.4	(12.5–16.2)	6.6	(5.0–8.2)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

[c]Data only available from 2016–2019

Appendix

Percent of Wisconsin birthing parents who experienced stressful events during the year before birth by population, 2015–2019

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Moved to a new address	40.7	(38.4–42.9)	28.1	(25.7–30.5)
Argued with husband or partner more than usual	33.6	(31.5–35.7)	16.0	(14.0–18.1)
Someone very close to them passed away	28.3	(26.2–30.3)	17.3	(15.3–19.3)
Had problems paying the rent, mortgage, or other bills	26.4	(24.4–28.4)	15.3	(13.3–17.3)
Had a close family member who was very sick and had to go to the hospital	24.2	(22.2–26.1)	24.9	(22.7–27.2)
Lost their job even though they wanted to keep working	21.2	(19.4–23.1)	4.9	(3.7–6.1)
Husband or partner or themselves had a cut in work hours or pay	16.5	(14.9–18.1)	14.0	(12.1–15.8)
Someone very close to them had a problem with alcohol or substance use	13.7	(12.1–15.2)	12.3	(10.5–14.1)
Husband or partner lost their job	12.4	(11.0–13.9)	7.2	(5.7–8.7)
Husband or partner said they didn't want the birthing parent to be pregnant	11.9	(10.4–13.4)	5.2	(4.0–6.5)
Separated or divorced from husband or partner	9.4	(8.1–10.7)	4.2	(3.1–5.4)
Husband or partner or themselves went to jail	9.3	(8.0–10.5)	2.5	(1.6–3.3)
Was homeless or had to sleep outside in a car or in a shelter	7.5	(6.3–8.8)	1.3	(0.7–2.0)
Was apart from husband or partner due to military deployment or extended work-related travel	2.0	(1.4–2.6)	3.8	(2.8–4.8)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents who experienced abuse by population, 2015–2019
Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Experienced physical abuse during the year before pregnancy or during pregnancy (including being pushed, hit, slapped, kicked, choked or physically hurt in another way by a partner, ex-partner, or someone else)	11.6	(10.1–13.1)	3.8	(2.7–4.8)
Experienced emotional or sexual abuse during pregnancy (including being threatened, made to feel unsafe, threatened, controlled, or forced to take part in touching or any sexual activity by husband or partner)	11.1	(9.5–12.7)	4.0	(2.7–5.2)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth
[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who reported being in good, very good, or excellent general health before pregnancy by population, 2015–2019
Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Good, very good, or excellent general health before pregnancy	86.6	(85.1–88.1)	96.3	(95.2–97.4)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth
[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who had diagnosed health conditions before pregnancy by population, 2015–2019
Data source: Wisconsin Birth File

	Non-Hispanic Black		Comparison group[a]	
	Percent	95% C.I.[b]	Percent	95% C.I.[b]
Diabetes	1.8	(1.7–2.0)	0.7	(0.7–0.8)
Hypertension[c]	5.9	(5.6–6.1)	1.9	(1.8–2.0)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth
[b]C.I. = Confidence interval
[c]Pre-pregnancy hypertension defined as above normal blood pressure considering age, sex, and physiological condition

Appendix

Percent of Wisconsin birthing parents who received a diagnosis for a health condition during pregnancy by population, 2015–2019

Data source: Wisconsin Birth File

	Non-Hispanic Black		Comparison group[a]	
	Percent	95% C.I.[b]	Percent	95% C.I.[b]
Gestational diabetes	5.2	(4.9–5.4)	6.3	(6.2–6.4)
Gestational hypertension	9.0	(8.7–9.4)	7.6	(7.5–7.7)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who discussed their desire to have or not have children with a doctor, nurse, or other health care worker during preconception care by population, 2016–2019

Among those who had a health care visit during the year before pregnancy

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Discussed desire to have or not have children during preconception care	37.3	(34.2–40.4)	49.6	(46.4–52.9)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Percent of Wisconsin birthing parents who were not doing anything to prevent pregnancy during the months following a previous birth by population, 2016–2019

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Was not doing anything to prevent pregnancy during the months following a previous birth	22.0	(20.1–24.0)	17.4	(15.4–19.4)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval

Appendix

Percent of Wisconsin birthing parents who reported reasons for not doing anything to prevent pregnancy during the months following a previous birth by population, 2016–2019

Among those who were not doing anything to prevent pregnancy during the months following a previous birth

Data source: Wisconsin PRAMS

	Non-Hispanic Black		Comparison group[a]	
	Weighted percent	95% C.I.[b]	Weighted percent	95% C.I.[b]
Worried about the side effects of birth control	42.9	(38.0–47.7)	20.6	(15.8–25.4)
Did not want to use birth control	40.8	(36.0–45.6)	39.9	(33.9–45.9)
Was not having intercourse	39.2	(34.4–43.9)	23.2	(17.9–28.4)
Wanted to get pregnant	13.3	(10.1–16.6)	26.8	(21.4–32.2)
Husband or partner didn't want to use anything	13.1	(10.0–16.2)	7.0	(3.9–10.2)
Had problems paying for birth control	4.4	(2.1–6.6)	0.0	(0.0–0.0)
Had tubes tied	4.0	(2.0–6.0)	5.6	(2.7–8.6)
Was currently pregnant	3.9	(1.9–5.8)	0.3	(0.0–0.9)

[a]Comparison group comprised of birthing parents who are non-Hispanic white, age ≥ 20 years, and had ≥ 13 years education at birth

[b]C.I. = Confidence interval