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

Understanding Inequities in Fetal and Infant Mortality Impacting American Indian and Alaska Native 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.

## Contact information

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## Report contributors

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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 and Culture

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.

With this work, we also recognize the value of traditional ways of knowledge. Traditional practices for healthy pregnancy, birthing, and parenting embrace holistic well-being and community support. Along with focusing on the body, these practices also promote a healthy mind and spirit. Forced assimilation prevented traditional practices and caused harm to the health of communities and families. It is important to ensure that everyone has the opportunity to birth and parent in alignment with their hopes and cultural identities.

Much of the work to restore traditional practices is being done at the community level. Indigenous midwives and doulas provide expecting families knowledge and the space for their desired experiences. Elders are leaders within communities and share their wisdom.

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. We work towards lowering the rate of loss so that all families experience a healthy birth outcome and our babies have a happy healthy first birthday.

Artwork by Brittany Tainter
Giizhig Design Company LLC (giizhig.com)

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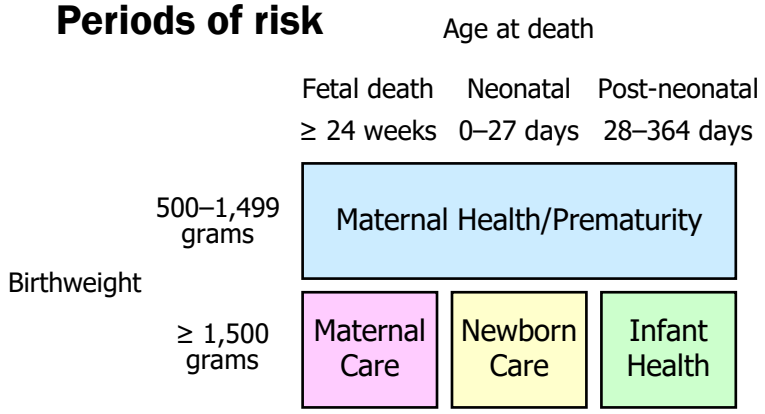
# Executive Summary

## What is PPOR?

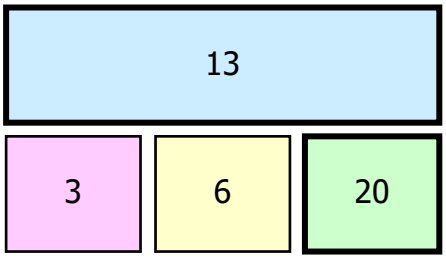
Perinatal Periods of Risk (PPOR) identifies how many deaths could be avoided if death rates were the same across different groups. Death rates for **populations impacted by inequities** are compared to lowest observed rates to better **understand excess deaths**. Understanding what causes inequities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

## Periods of risk



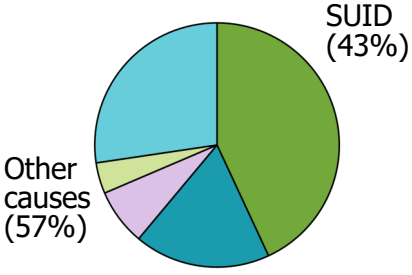

## When do excess fetal and infant deaths occur? (2015–2019)

Excess American Indian/Alaska Native fetal and infant deaths



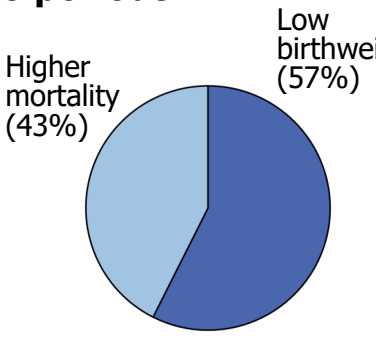

Most excess deaths occur within the **Infant Health** and **Maternal Health/Prematurity** periods of risk.

## 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.




Both **higher rates of low birthweight** and **higher mortality rates among low birthweight infants** contribute to excess deaths within the **Maternal Health/ Prematurity** period.

## How can PPOR findings be used?

The PPOR analysis helped to identify **three key prevention areas: SUID, low birthweight, and mortality among low birthweight infants**. Focusing on SUID and low birthweight prevention may help to reduce excess fetal and infant deaths and inequities impacting American Indian/Alaska Native 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

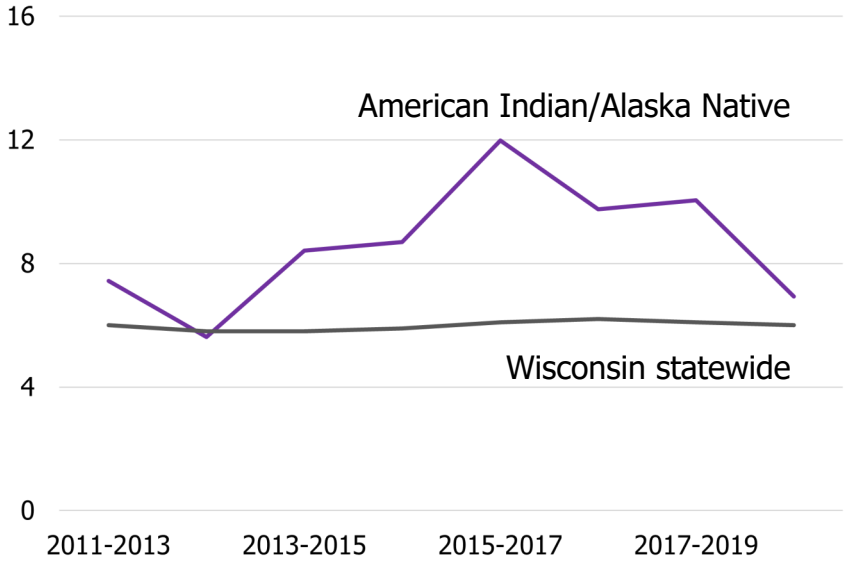
Wisconsin is currently home to 11 federally recognized American Indian Nations and Brothertown Nation, a tribe not federally or state recognized.[1] American Indian communities have a vibrant culture that is an important part of Wisconsin's history. However, these communities have experienced, and continue to experience, systemic injustices that lead to health inequities that we see today. It is important to prioritize and elevate the health needs of American Indian communities.

Infant mortality rates have been, and continue to be, high among American Indian/Alaska Native communities in Wisconsin. Since 2011, the mortality rate has been about 1.4 times higher for American Indian/Alaska Native infants compared to the statewide rate. It is crucial to address and reduce this longstanding inequity.

We already know the leading causes of death for American Indian/Alaska Native 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.

## Infant mortality rate, 2011–2020

Per 1,000 live births




## Leading causes of infant death, 2015–2019

| Wisconsin statewide | American Indian / Alaska Native |
|---|---|
| Birth defects (21%) | Short gestation or low birthweight (16%) |
| Short gestation or low birthweight (20%) | Birth defects (10%) |
| Pregnancy complications (6%) | Circulatory (6%) |
| Unintentional injuries (5%) | Pregnancy complications (4%) |
| Placenta, cord, membrane (4%) | Unintentional injuries (4%) |

# Overview of PPOR

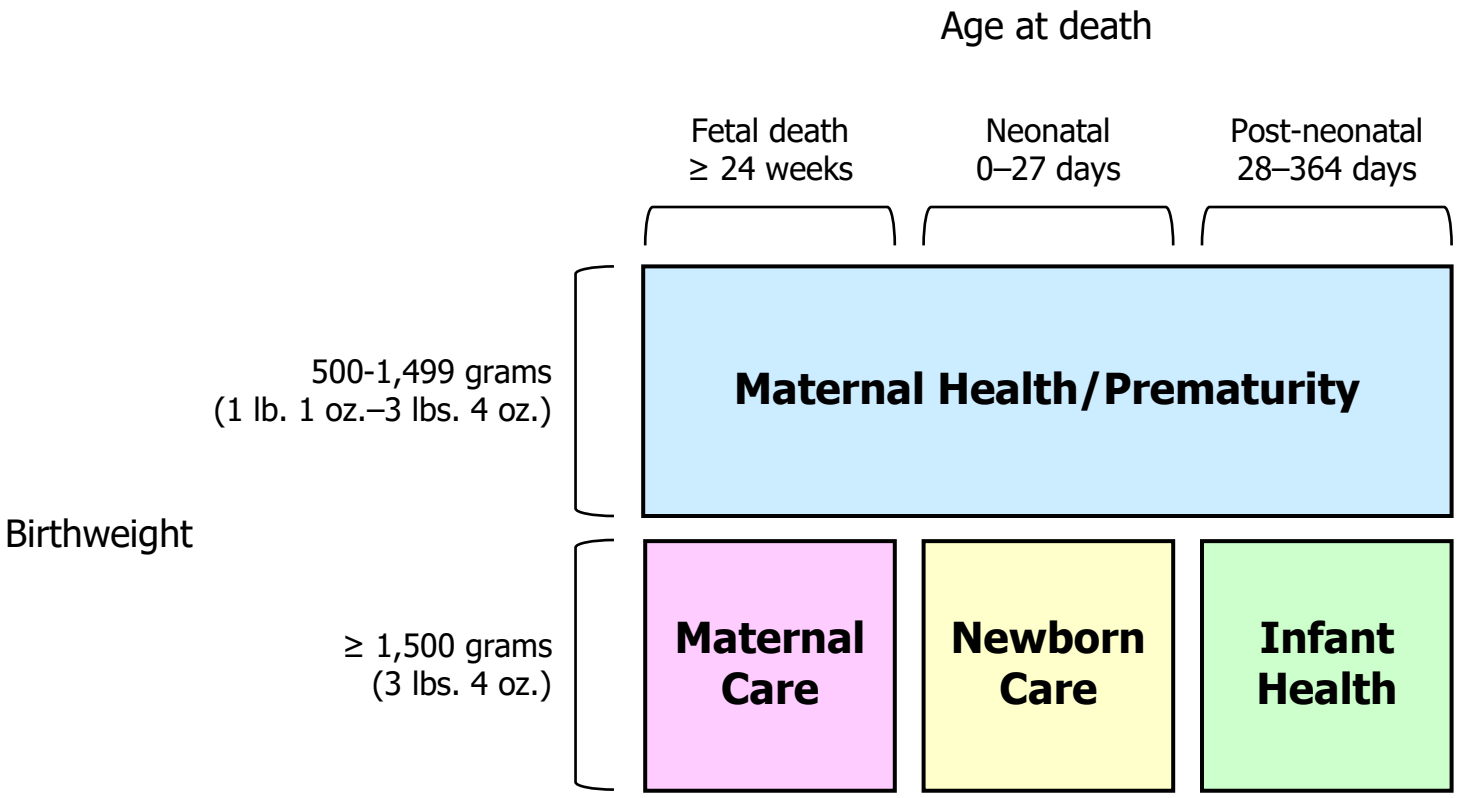
## What is PPOR?

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.

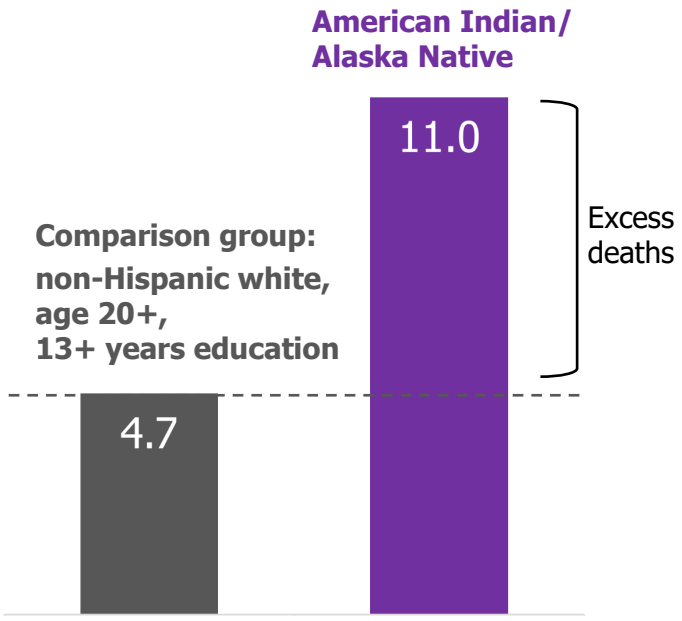
This PPOR analysis aims to better understand the causes of inequities that impact **American Indian/Alaska Native** infants in Wisconsin.

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 American Indian/Alaska Native infants (total rate per 1,000 live births and fetal deaths = 11.0) 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 American Indian/Alaska Native infants.

### Fetal and infant mortality rate, 2015–2019

Per 1,000 live births and fetal deaths



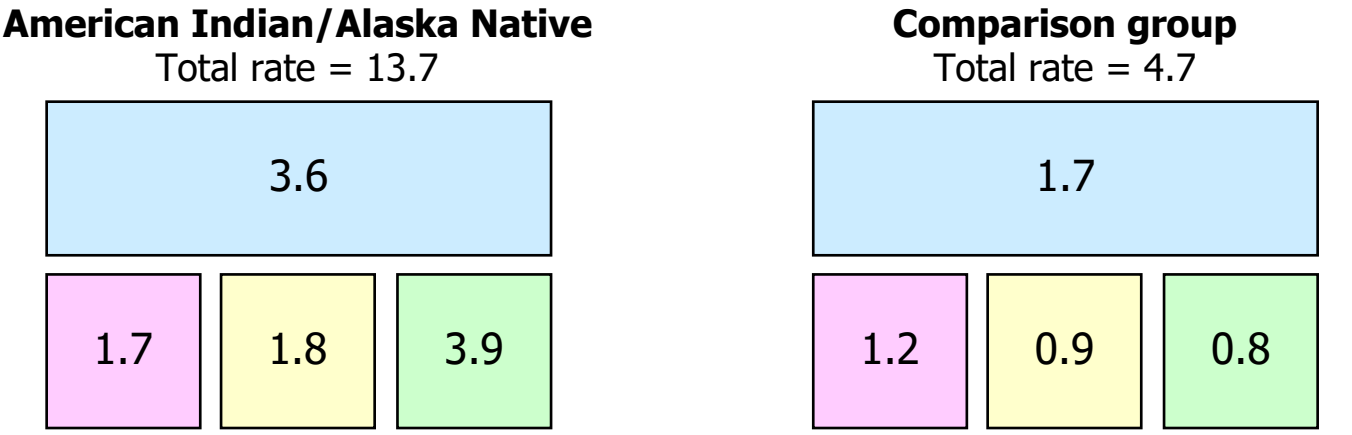
# Phase I

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 American Indian/Alaska Native 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

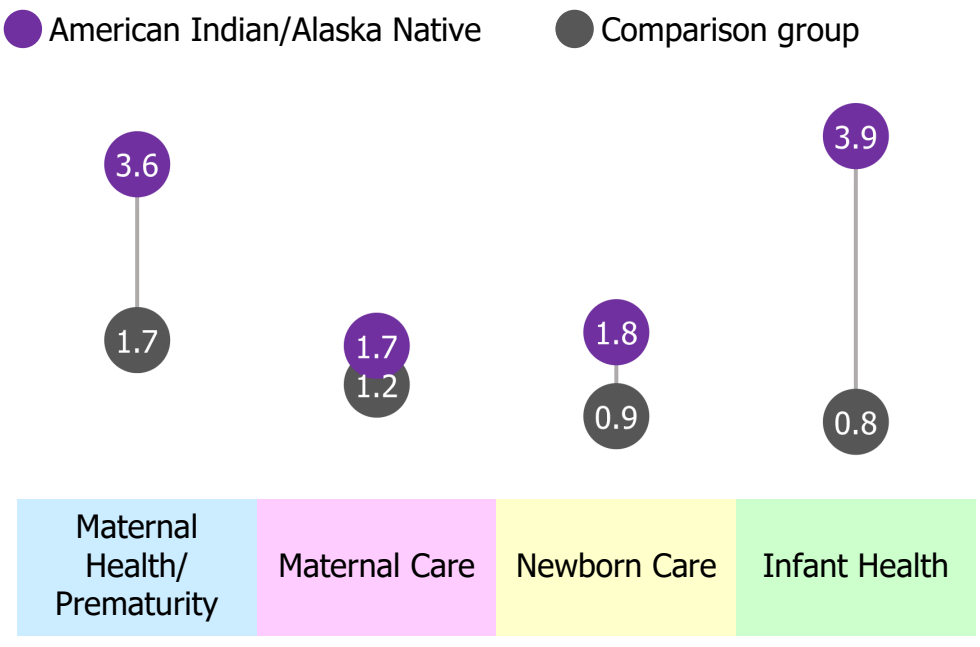



Using rates allows us to compare health outcomes between groups. American Indian/Alaska Native infants experience higher mortality rates across all four periods of risk. The visual comparison of rates to the right shows that the Infant Health and Maternal Health/ Prematurity periods have the greatest 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

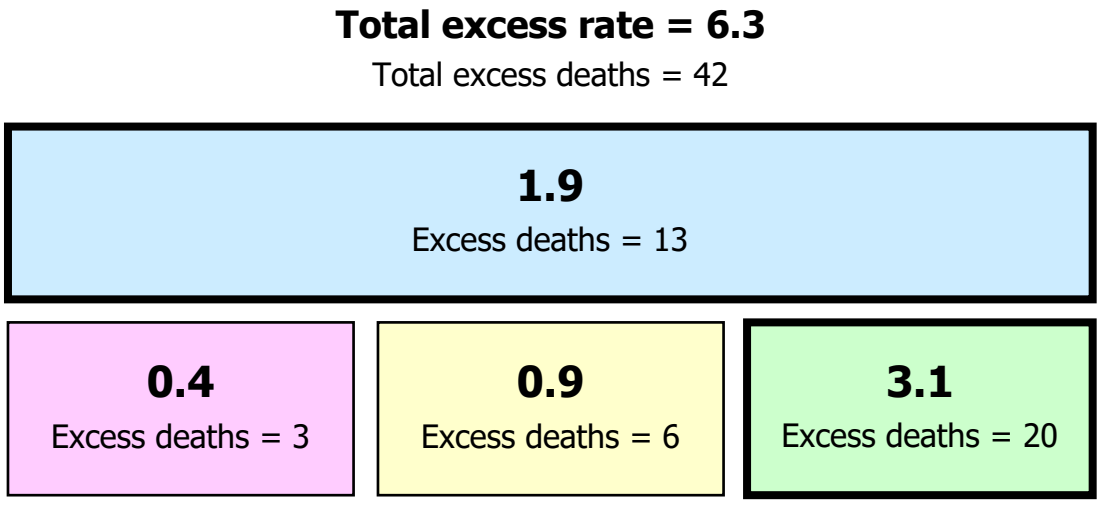


# Phase I

Fetal and infant mortality rates for the comparison group are subtracted from rates for the American Indian/Alaska Native population. This results in **excess** rates, which can be converted into **excess** deaths.

### Excess mortality rates for American Indian/Alaska Native population, 2015–2019

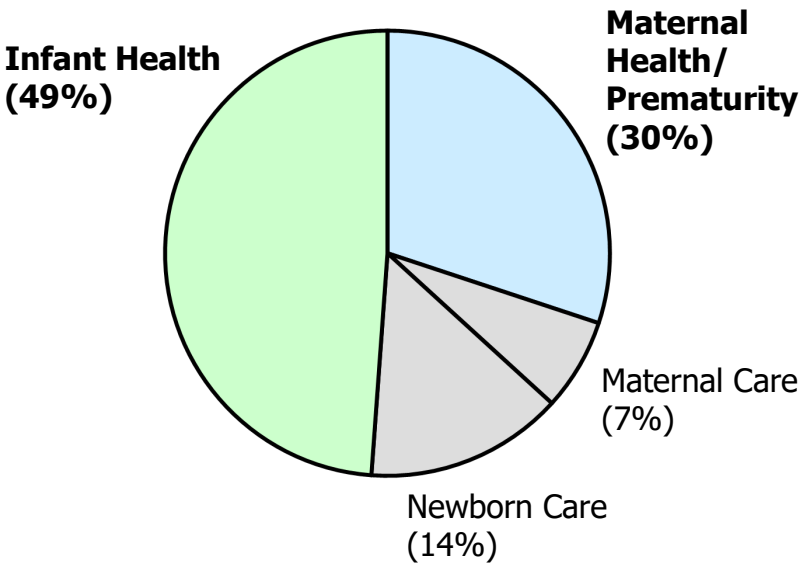
Per 1,000 live births and fetal deaths




From 2015 to 2019, there were 42 total excess deaths to American Indian/Alaska Native birthing persons. There were 20 excess deaths that occurred within the **Infant Health period**, more than any other period of risk. The Infant Health period accounted for 49% of excess American Indian/Alaska Native deaths. Many excess deaths also occurred within the **Maternal Health/ Prematurity period**. This period had 13 excess deaths (30%).

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

### Contribution to excess American Indian/ Alaska Native fetal and infant deaths



# Phase II for Infant Health Period

Phase I identified the Infant Health period as having the highest number of excess American Indian/Alaska Native 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 American Indian/Alaska Native 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.

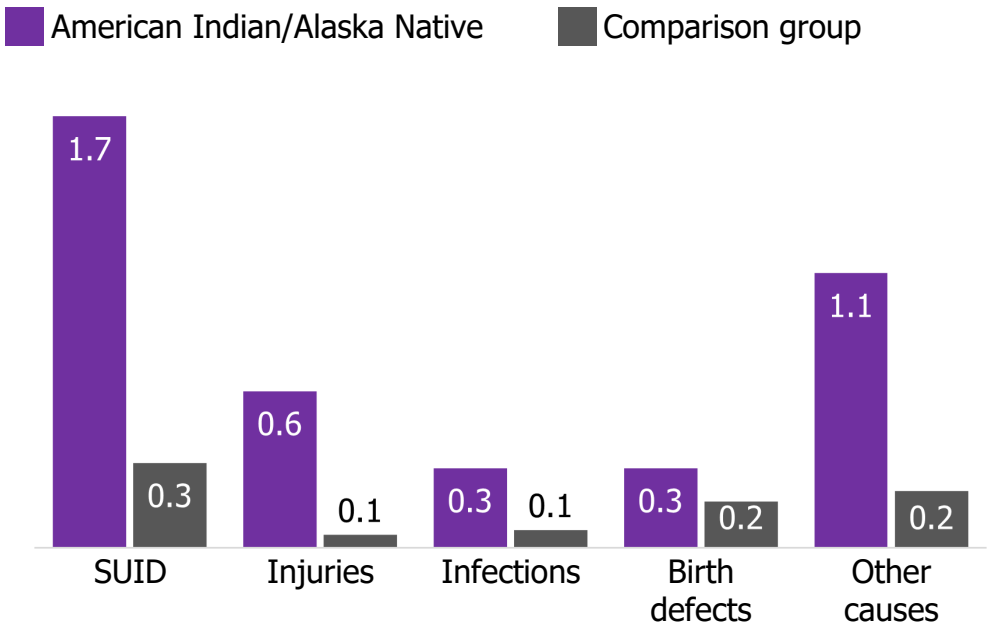
**Cause of death categories**

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

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 American Indian/Alaska Native and comparison populations to calculate excess rates and deaths.

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

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



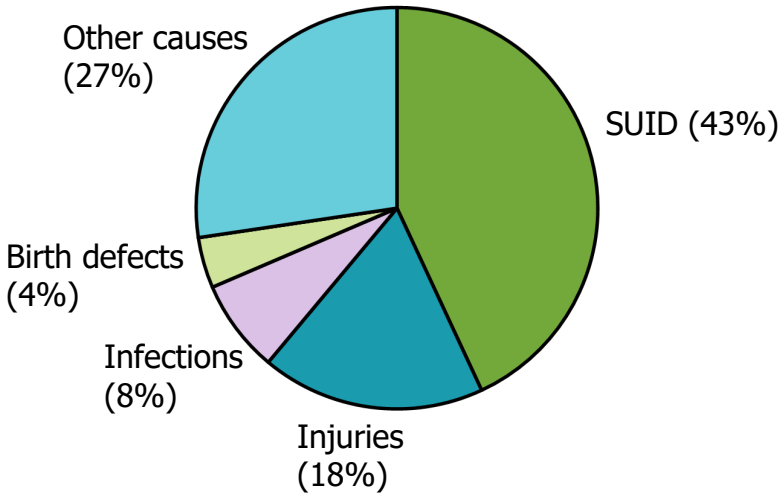
# Phase II for Infant Health Period

For each cause of death category, infant mortality rates for the comparison group are subtracted from rates for the American Indian/Alaska Native population to calculate excess rates. Excess rates are used to calculate the number of excess American Indian/Alaska Native deaths due to each cause within the Infant Health period.

The leading cause of **excess** deaths within **the Infant Health period** is SUID with 9 excess deaths. SUID accounts for 43% 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 American Indian/ Alaska Native deaths |
|---|---|
| Sudden unexpected infant death (SUID) | 9 |
| Injuries | 4 |
| Infections | 2 |
| Birth defects | 1 |
| Other causes | 6 |

## Contribution to excess American Indian/Alaska Native 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 American Indian/Alaska native 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**

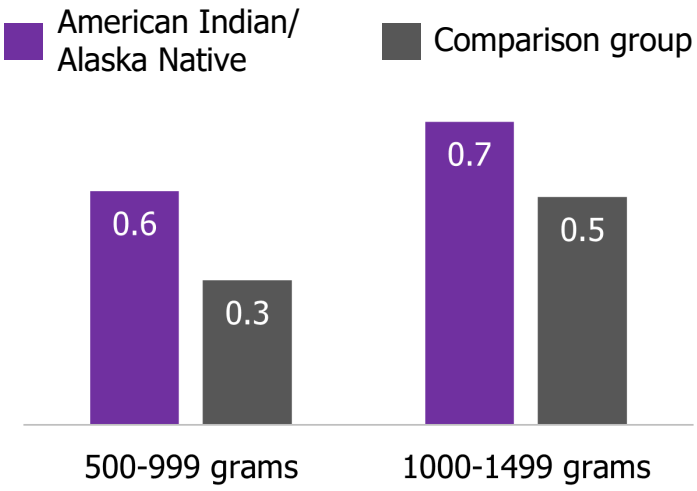
The Maternal Health/Prematurity period includes deaths where:

- 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 American Indian/Alaska Native 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 American Indian/Alaska Native and comparison populations.

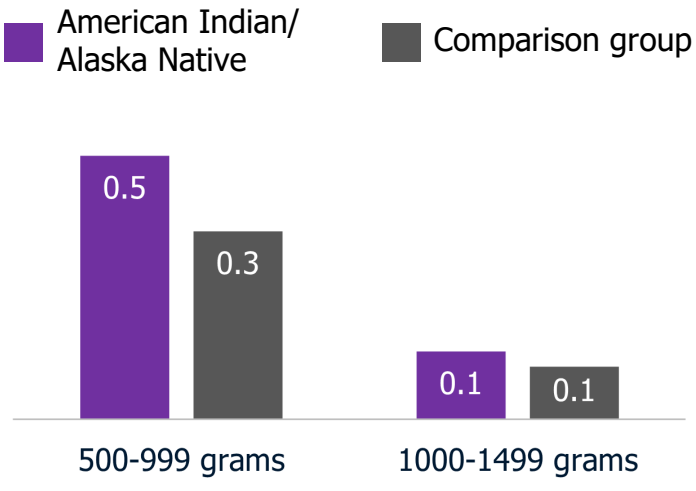
## Rates of low birthweight by population and birthweight, 2015–2019

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




## Infant mortality rates by population and birthweight, 2015–2019

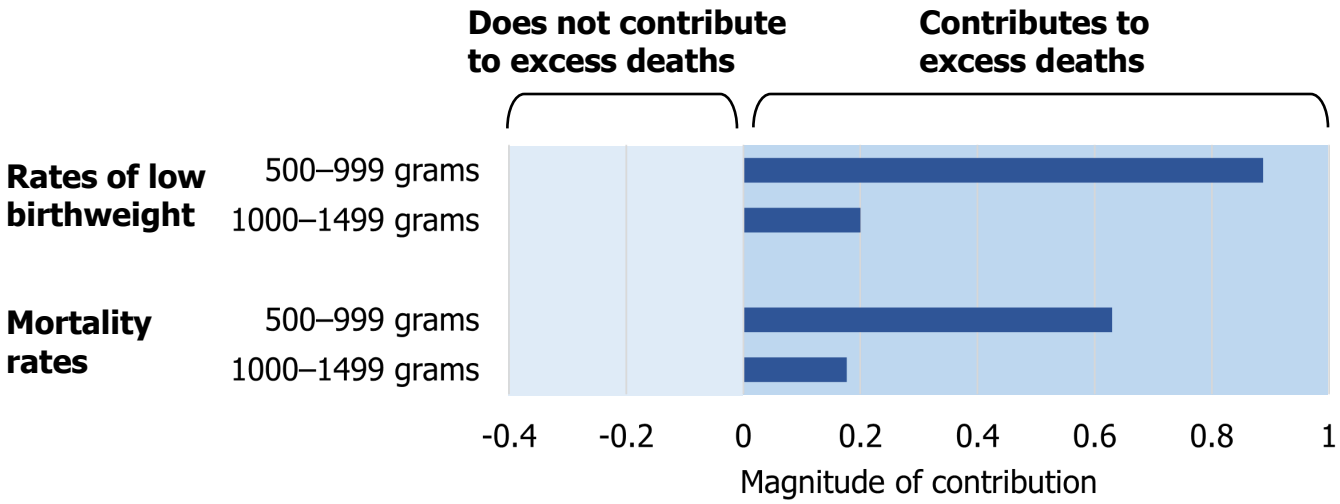
Per 1,000 live births and fetal deaths, among deaths within Maternal Health/Prematurity period



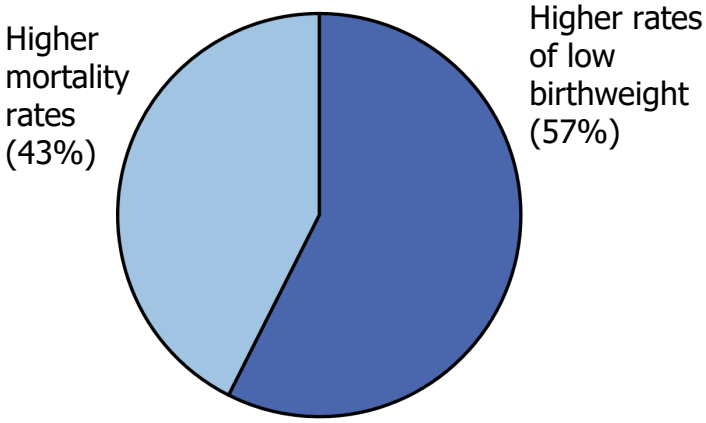

The graph on the left shows us that American Indian/Alaska Native infants are more likely to be born at a very low birthweight (less than 1,500 grams) than infants in the comparison group. The graph on the right shows that, among infants born at very low birthweights, American Indian/Alaska Native infants also experience higher mortality rates compared to infants in the comparison group.

# Phase II for Maternal Health/Prematurity Period

## Contribution to excess American Indian/Alaska Native deaths within Maternal Health/Prematurity period




The leading cause of **excess** deaths within the **Maternal Health/Prematurity** period is having higher rates of very low birthweight among the American Indian/Alaska Native population. Rates of low birthweight account for 57% of excess Maternal Health/ Prematurity period deaths (7 excess deaths from 2015–2019). Having higher mortality rates also contributed to excess deaths within this period, accounting for 6 excess deaths from 2015–2019 (43%). Prevention efforts should focus on increasing birthweight and preventing deaths among low birthweight infants. These efforts may help to reduce excess deaths within the Maternal Health/ Prematurity period and overall disparities in infant mortality.




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

# Using PPOR Findings

The PPOR analysis helped to identify **three key prevention areas: SUID, low birthweight, and mortality among low birthweight infants**. Focusing on these areas may help to reduce excess fetal and infant deaths and inequities impacting American Indian/Alaska Native 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 a lack of representation in data, research, and health care settings, as noted by Dr. Katy Kozhimannil.[5] Data on inequities experienced by American Indian/Alaska Native communities are not consistently reported as data systems often fail to collect representative samples.[5] Community voices and expertise are also often missing from policy-making settings and the health care workforce.[5] These systemic factors ultimately impact the resources and care that American Indian/Alaska Native individuals receive.

It is necessary to recognize past and current systemic harms and their impacts on health. Prevention efforts to reduce SUID, low birthweight, and mortality among low birthweight babies must be trauma-informed. They must include voices and leadership from the communities they are aiming to help. It is also important to recognize that American Indian/Alaska Native communities are diverse in their cultures, needs, and solutions.

The remaining sections of the report explore in depth how prevention efforts may address SUID, low birthweight, and mortality among low birthweight infants for American Indian/Alaska Native communities.

# Prevention Area: SUID

Preventing SIDS and SUID for American Indian/Alaska Native 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. Cradleboards are a culturally appropriate sleep surface for some families.
- 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

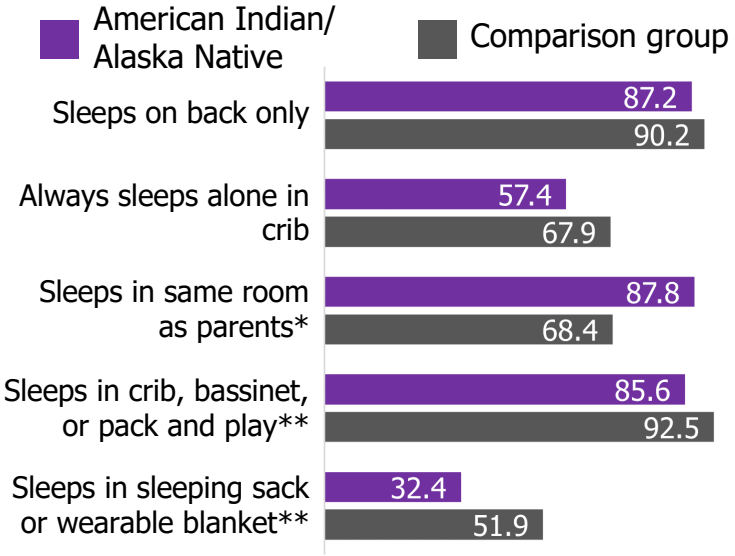
Babies sleeping in an unsafe environment or in an unsafe way are at increased risk of SUID. Data tell us that although many American Indian/Alaska Native babies sleep safely, there are still opportunities for improvement.

Aligning with recommendations, American Indian/Alaska Native infants usually sleep in the same room as their parents and are more likely to do so than infants in the comparison group. About nine in 10 American Indian/Alaska Native infants are also placed to sleep on their backs only.

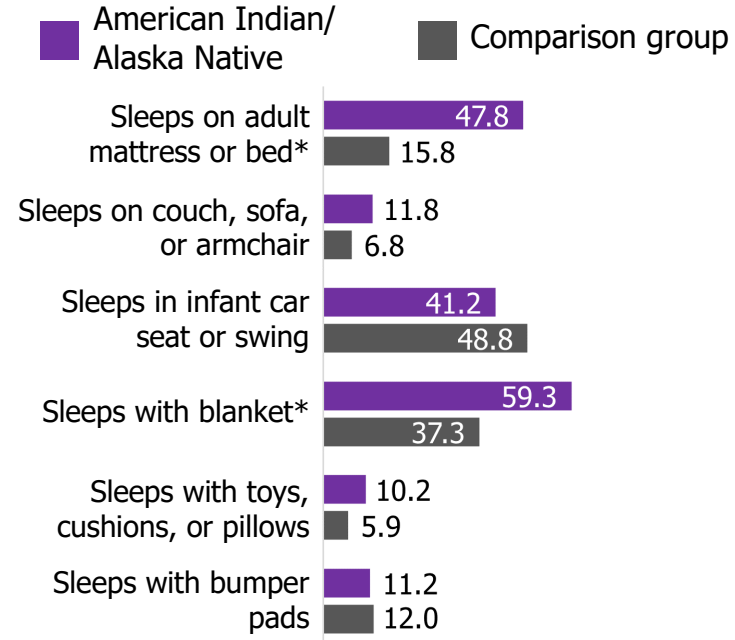
American Indian/Alaska Native infants are less likely to sleep in a crib, bassinet, or pack and play than comparison group infants. (It is important to note that this survey question did not ask about other safe, firm sleeping surfaces.) They are also more likely to sleep on an adult mattress or bed. Over half of American Indian/Alaska Native infants usually sleep with a loose blanket, and they are less likely to sleep in a sleeping sack or wearable 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, the majority of American Indian/Alaska Native 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. These 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 American Indian/Alaska Native population at α = 0.05
** Significantly higher for comparison group at α = 0.05

# Prevention Area: SUID

## Smoke exposure during pregnancy and after birth

**30.1%** of American Indian/Alaska Native birthing parents smoked cigarettes during pregnancy.*

**33.2%** of American Indian/Alaska Native birthing parents lived with someone who smoked cigarettes at the time of birth.*

**31.3%** of American Indian/Alaska Native birthing parents smoked cigarettes during the months following birth.*

(2015–2019)

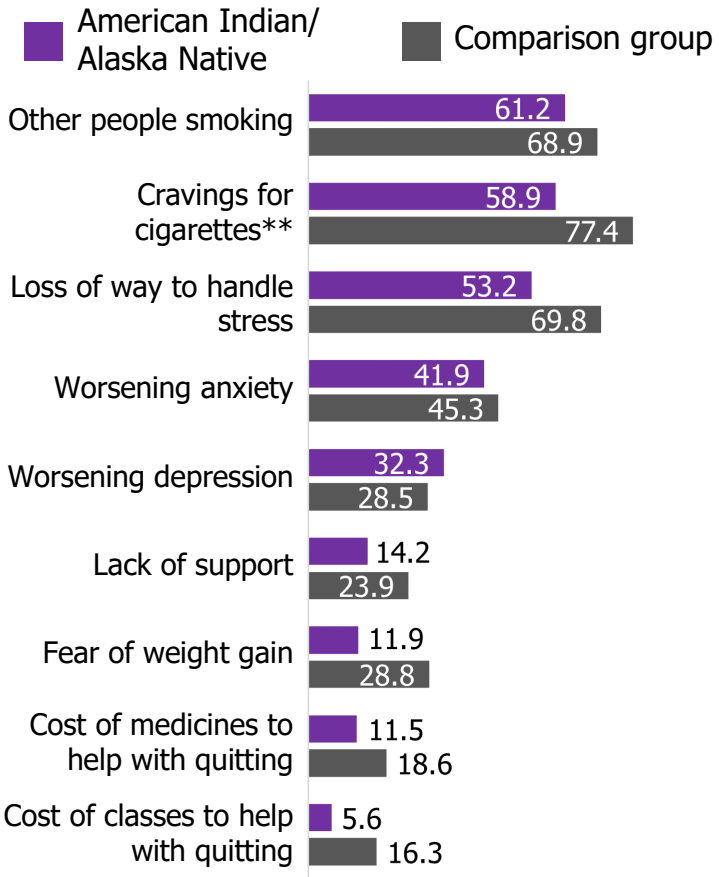
Reducing smoke exposure during pregnancy and after birth can help to reduce the risk of SUID. American Indian/Alaska Native birthing parents were more likely to smoke cigarettes during or after pregnancy or live with someone who smoked cigarettes than those in the comparison group.

Among American Indian/Alaska Native birthing parents who smoked prior to pregnancy, 48.1% of them quit during pregnancy. There was no difference between groups in the proportion who quit during pregnancy. American Indian/Alaska Native 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 other people around them smoking. (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. Interventions should also be culturally appropriate and honor relationships with traditional tobacco.

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

Among those who smoked during three months before pregnancy




* Significantly higher for American Indian/Alaska Native 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, about one in 10 American Indian/Alaska Native birthing parents reported marijuana use for any reason during pregnancy, greater than reported use for those in the comparison group. Also, some American Indian/Alaska Native birthing parents reported using prescription pain relievers during pregnancy for any reason.

The majority of American Indian/Alaska Native 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


**98.6%** of American Indian/Alaska Native birthing parents were asked if they were using alcohol by a health care provider during a prenatal care visit.

**87.9%** of American Indian/Alaska Native birthing parents were asked if they were using substances by a health care provider during a prenatal care visit.

(2016–2019)

* Significantly higher for American Indian/Alaska Native 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.)

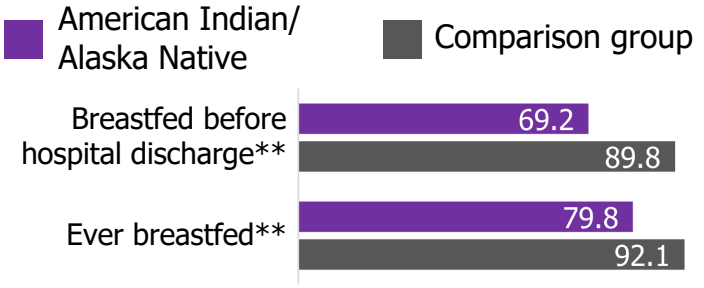
American Indian/Alaska Native birthing parents were less likely to breastfeed their infant prior to hospital discharge or at any time.

Hospitals or birthing facilities may help to support feeding practices. American Indian/Alaska Native birthing parents are more likely to be provided with a breast pump than those in the comparison group. However, American Indian/Alaska Native birthing parents are less likely to be given information on breastfeeding. Despite the potential for support, American Indian/Alaska Native birthing parents are less likely to breastfeed while at the hospital after birth.

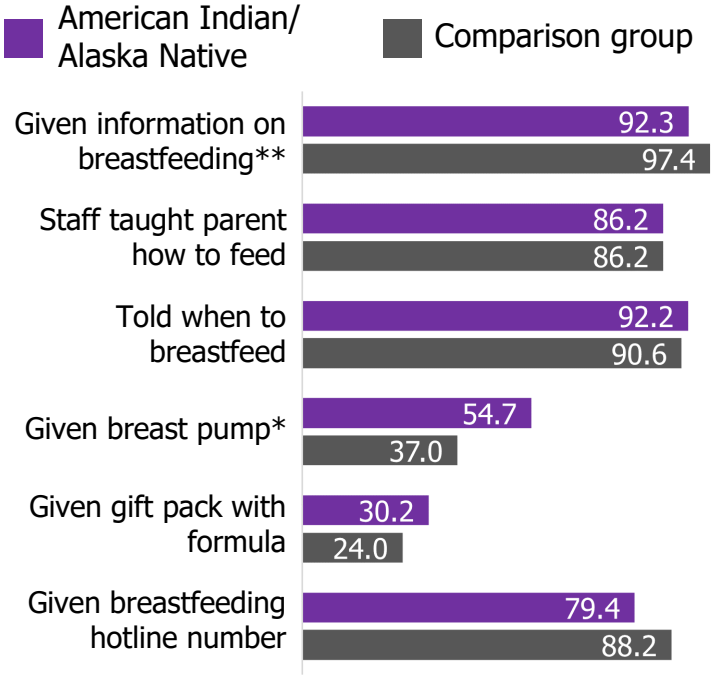
American Indian/Alaska Native birthing parents received information on breastfeeding from various sources. The most common source was their own doctor, with 83.5% receiving information from this source. Many also received information from their baby's doctor, a lactation specialist, a nurse, a midwife, a doula, family, or friends. Few American Indian/Alaska Native birthing parents received breastfeeding information from a support group or hotline.

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 American Indian/Alaska Native 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

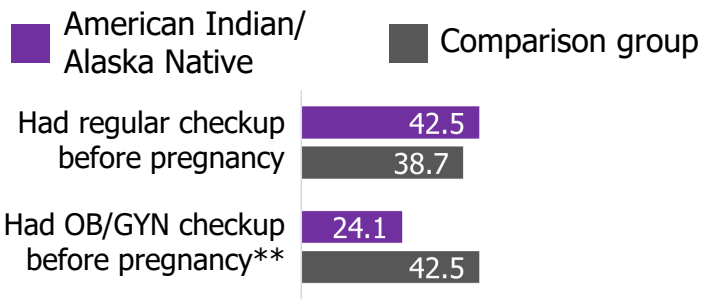
Preconception care, or care that occurs before pregnancy, can help to promote overall health prior to pregnancy. People should be able to not just access preconception care but also receive care that is high-quality and culturally appropriate.

During the year before pregnancy, American Indian/Alaska Native birthing parents were just as likely to have had a regular checkup as those in the comparison group. However, they were less likely to have had an obstetrics and gynecology (OB/GYN) checkup. Referrals to OB/GYN care prior to pregnancy may help to improve preconception care access.

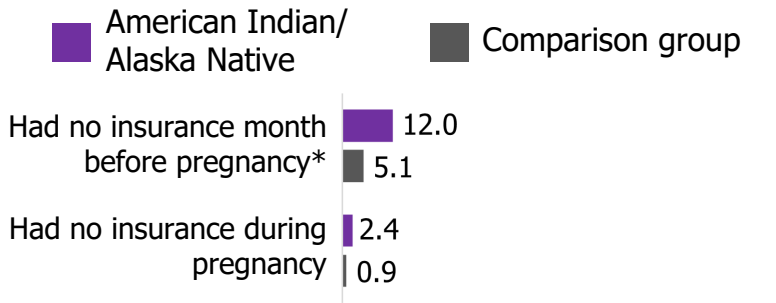
Insurance coverage impacts health outcomes, as having health insurance can help facilitate access to health care. Prior to pregnancy, 12.0% of American Indian/Alaska Native birthing parents did not have health insurance, nearly twice that of comparison group birthing parents. There was no significant difference in health insurance coverage between American Indian/Alaska Native and comparison group birthing parents during pregnancy.

### Percent with preconception care, 2016–2019

During year before pregnancy




### Percentage without health insurance, 2015–2019




* Significantly higher for American Indian/Alaska Native 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

**64.7%** of American Indian/Alaska Native birthing parents received adequate prenatal care (based on Kotelchuck index of prenatal care adequacy; see Data Notes for further details).**

**21.1%** of American Indian/Alaska Native birthing parents did not receive prenatal care as early as they wanted.*

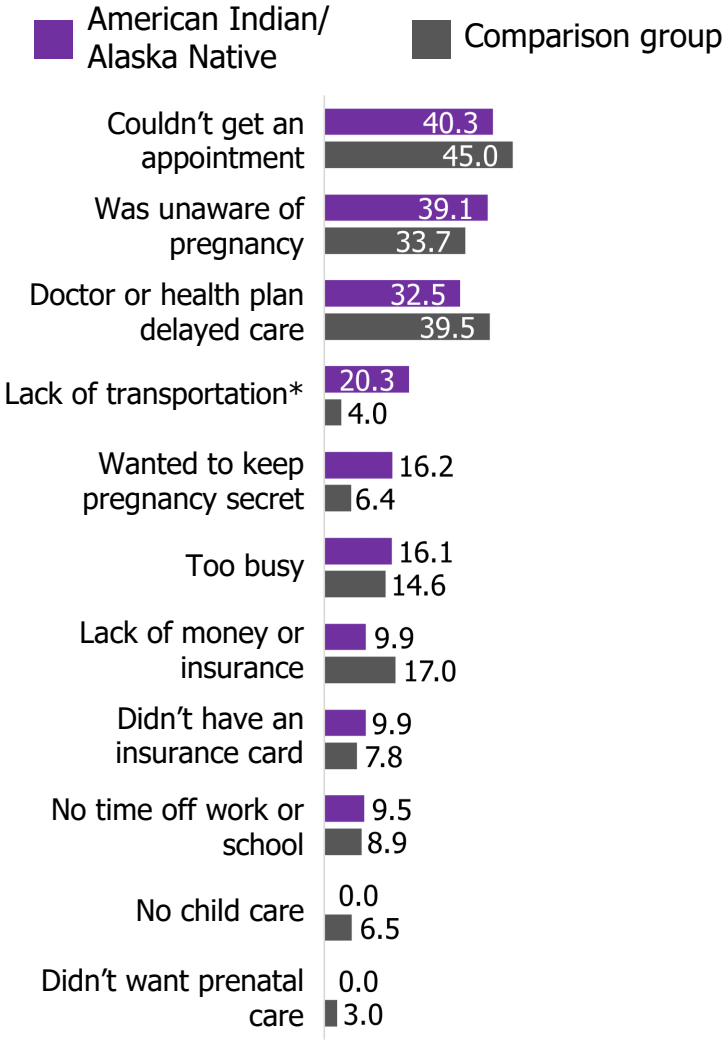
(2015–2019)

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. American Indian/Alaska Native 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).

About one in five American Indian/Alaska Native birthing parents reported not receiving prenatal care as early as they wanted. These parents most commonly reported an inability to get a prenatal care appointment, being unaware of the pregnancy, or having doctors or health plans delaying their care as barriers to receiving early prenatal care. Compared to the comparison group, they were much more likely to report a lack of transportation as a barrier to receiving prenatal care as early as they wanted.

### 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 American Indian/Alaska Native population at α = 0.05
** Significantly higher for comparison group at α = 0.05

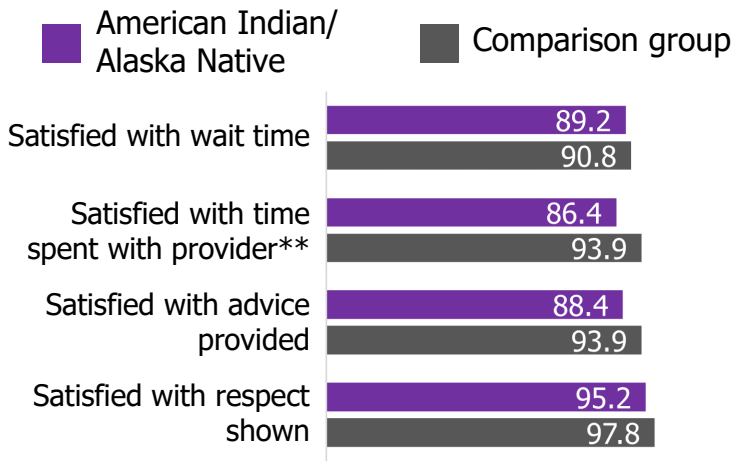
# Prevention Area: SUID

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

One study interviewed American Indian women from a Northern Plains Tribe who had at least one previous pregnancy to better understand their experiences with prenatal care at Indian Health Service facilities.[9] Although it is important to note that the study only collected information from members of one tribe, it's findings could begin to provide insights into the experiences of others. Many of the women reported poor communication impacting their prenatal care experiences and leading to provider and health system distrust.[9] Some distrust was perpetuated with a lack of continuity of care and some women seeing different physicians for each appointment.[9] Ultimately these communication and institutional issues prevent strong patient-provider relationships.

**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. Indigenous people are underrepresented in the health care workforce, including for perinatal care.[5] Improving workforce diversity should be a priority for educational and health care systems, and investment in Indigenous workforce development programs may be one step.[5] It is also important that workforce diversity extend beyond physicians and include midwives, nurses, doulas, counselors, lactation consultants, and more.[5]

From 2015–2019, many American Indian/Alaska Native 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 amount of time spent with their provider. 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 American Indian/Alaska Native 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

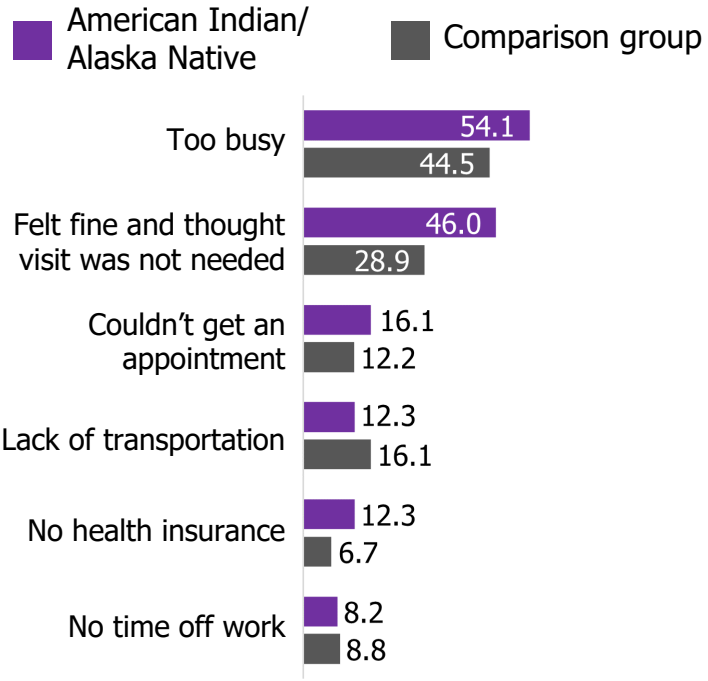
**83.4%** of American Indian/Alaska Native birthing parents received postpartum care.** (2015–2019)

Postpartum care provides an opportunity to promote parent and infant health following birth. Most American Indian/Alaska Native birthing parents receive postpartum care. However, fewer are able to receive care than parents in the comparison group.

Among American Indian/Alaska Native 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. Similar to a barrier reported for accessing prenatal care, some American Indian/Alaska Native birthing parents said that they were unable to get a postpartum care appointment. Some parents reported factors related to social determinants of health (such as lack of transportation 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 American Indian/Alaska Native 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.

American Indian/Alaska Native 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 American Indian/Alaska Native parents have the resources they want and need to care for their children.

**62.3%**

of American Indian/Alaska Native birthing parents were living below the federal poverty level at the time of birth.*

## Prematurity and low birthweight

**11.1%** of American Indian/Alaska Native infants were born preterm (less than 37 gestational weeks).*

**7.9%** of American Indian/Alaska Native 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. American Indian/Alaska Native 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 American Indian/Alaska Native 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 American Indian/Alaska Native population at α = 0.05
** Significantly higher for comparison group at α = 0.05

# Prevention Area: Low Birthweight

Reducing low birthweight for American Indian/Alaska Native 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]

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]

In 2016, one study identified risk factors for preterm birth that contribute inequities impacting American Indian/Alaska Native communites.[11] Both historical and current stress impacts overall health and preterm birth. Stress includes lifetime experiences of violence and abuse that are more prevalent among American Indian/Alaska Native women than the overall population.[11] Chronic and gestational medical conditions may increase the risk of preterm birth.[11] Thus, access to preconception and prenatal care is important for addressing such conditions and promoting the health of parent and child. Access to care is often related to geography and the distribution of resources. Many American Indian/Alaska Native families live in rural areas that may be medically underserved or where there may be shortages in specialty care.[11] Those living in more urban areas may not have access to resources and care that are affordable and culturally competent.[11]

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*

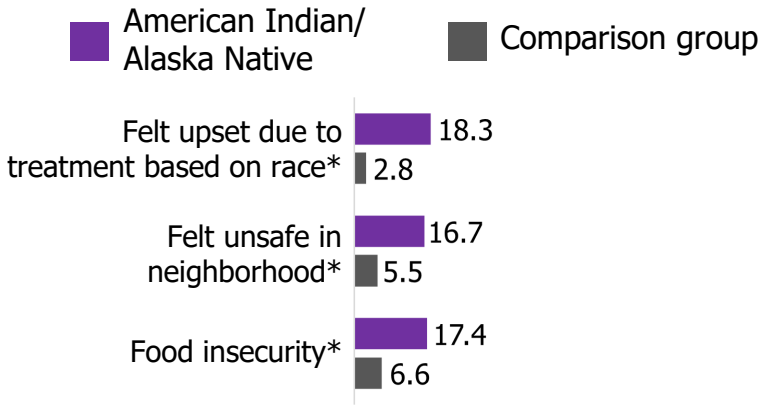
# Prevention Area: Low Birthweight

## Stressful events and experiences

Stressful events and experiences can increase the risk of low birthweight by impacting hormone levels and leading to preterm birth.[12] 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.[12] Stress and other risk factors occurring during crucial stages of development can impact health outcomes later in life.[12] Risk factors across the lifespan also accumulate to impact health.[12]

### 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. American Indian/Alaska Native birthing parents were more likely to experience several adverse social determinants of health than parents in the comparison group. Many American Indian/Alaska Native 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 American Indian/Alaska Native birthing parents experienced physical abuse before or during their pregnancy. Fourteen percent of American Indian/Alaska Native birthing parents experienced emotional or sexual abuse during their pregnancy. American Indian/Alaska Native 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.

**9.9%** of American Indian/Alaska Native birthing parents experienced physical abuse before or during pregnancy.*

**14.0%** of American Indian/Alaska Native birthing parents experienced emotional or sexual abuse during pregnancy.*

(2015–2019)

* Significantly higher for American Indian/Alaska Native population at α = 0.05
** Significantly higher for comparison group at α = 0.05

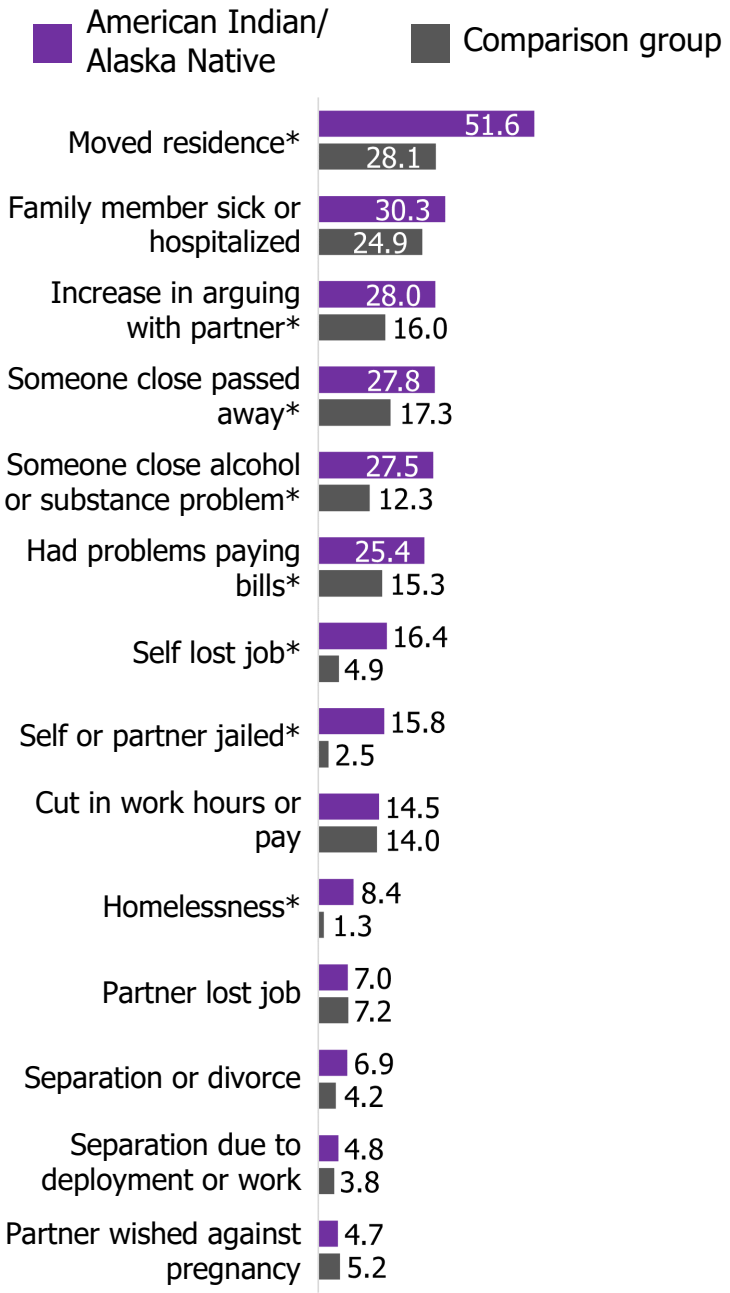
# Prevention Area: Low Birthweight

The most commonly reported stressful event during the year before birth among American Indian/Alaska Native birthing parents was moving residence, with over half reporting this experience. Other commonly reported stressors included having a family member sick or hospitalized, increasing arguing with their partner, having someone close to them pass away, having someone close to them with an alcohol or substance use problem, and having problems paying bills. Many stressors were more frequently experienced by American Indian/Alaska Native 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.[12] 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 American Indian/Alaska Native population at α = 0.05
** Significantly higher for comparison group at α = 0.05

# Prevention Area: Low Birthweight

## Chronic disease

**89.6%** of American Indian/Alaska Native 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, most American Indian/Alaska Native birthing parents said their general health was good, very good, or excellent. Pre-pregnancy diabetes and hypertension were not common for American Indian/Alaska Native birthing parents; however, they were slightly more common than for the comparison group.

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

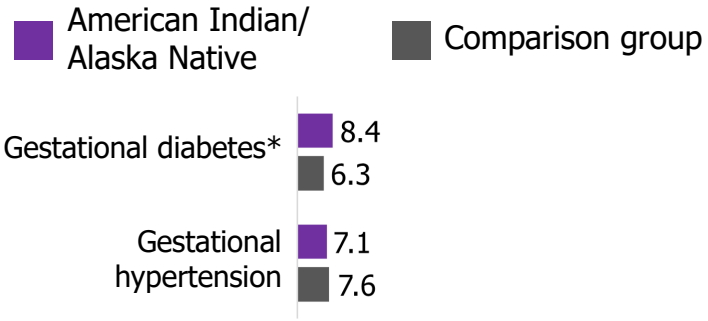

Lifetime stressors and risk factors lead to inequities in chronic disease. To address this, preventive approaches need to be implemented as early as the childhood years. Additionally, trust building with health care systems, elimination of bias in health care, prioritization of strategies to involve more American Indian/Alaska Native 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 American Indian/Alaska Native birthing parents while gestational hypertension was diagnosed at similar rates between groups.

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 American Indian/Alaska Native 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

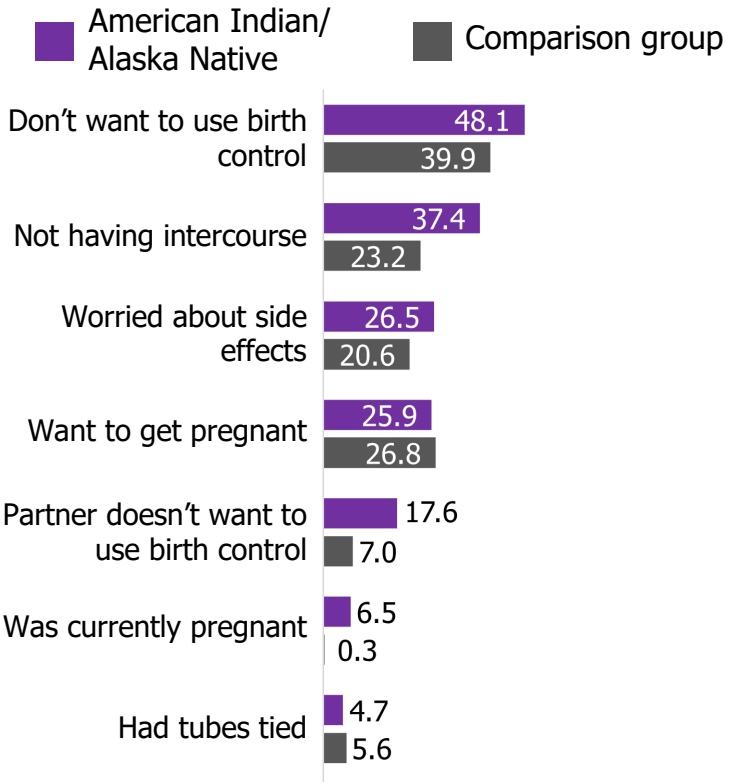
**29.6%** of American Indian/Alaska Native birthing parents discussed their desire to have or not have children during preconception care.**

(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."[13] American Indian/Alaska Native communities have historically had their right to reproductive justice attacked by means of diminished tribal sovereignty, forced sterilization, family separation, and laws prohibiting federal funds to be used for abortion services (limiting the care provided by the Indian Health Service).[14] Lack of reproductive justice impacts birthweight through marginalization, stress, reproductive planning, and timing between successive pregnancies.

### Percent reporting reasons for not using contraception, 2015–2019

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




Among American Indian/Alaska Native birthing parents who had a health care visit before pregnancy, about 30% 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, 17.2% of American Indian/Alaska Native 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.

There are many American Indian/Alaska Native activists and organizations working to restore reproductive justice for their communities. One such organization, Indigenous Women Rising, works towards reproductive justice through improved access to reproductive health care, environmental justice, culturally sensitive resources, and comprehensive sex education.[15]

* Significantly higher for American Indian/Alaska Native population at α = 0.05
** Significantly higher for comparison group at α = 0.05

# Prevention Area: Mortality Among Low Birthweight Infants

Preventing mortality among American Indian/Alaska Native infants born at a low birthweight is important for reducing inequities in infant mortality. Factors impacting mortality among low birthweight infants are complex and not well understood.

Gestational disease may impact outcomes for infants born at a low birthweight. Thus, access to quality and culturally appropriate prenatal care is important to promote health of people during pregnancy. Prenatal care can also be an opportunity to identify risks to the infant during pregnancy so that patients may be connected with specialty care.

Medical complications during delivery may contribute to mortality among infants born at a low birthweight. Complications may cause health risks for the parent or infant, and it is important that care is available to mitigate these risks.

When infants are born at a low birthweight, it is crucial that they have access to health care that can mitigate any risks. However, access to care is often impacted by geographic location. American Indian/Alaska Native people live all across the state of Wisconsin. Many people live in rural areas where there may be provider shortages or challenges in finding specialty care.[11] Needing to travel long distances may also be a barrier to accessing care for those living in rural areas. American Indian/Alaska Native individuals living in urban areas may also experience difficulties accessing care. Costs and lower availability of care through the Indian Health Service may be barriers to accessing care for those living in urban areas.[11] Regardless of geographic location, health systems must work to provide culturally competent care and build trust with communities to help facilitate access.

The ability of birthing facilities to provide high-risk, specialty treatment is assessed through the assignment of neonatal and obstetric levels of care. Patients may seek facilities with a level of care that matches their medical needs. In Wisconsin, not all birthing facilities have completed a level of care assessment. Universal level of care assessment across birthing facilities may increase transparency about the care provided at each facility and aid in patient transfers.

Prenatal care and gestational disease may impact mortality among low birthweight infants, and these factors have been described in previous sections of this report. (Go to pages 18–19 to learn more about access to quality and culturally appropriate prenatal care. Go to page 25 to learn more about gestational disease.) The subsequent section explores data on complications during labor for Wisconsin communities.

# Prevention Area: Mortality Among Low Birthweight Infants

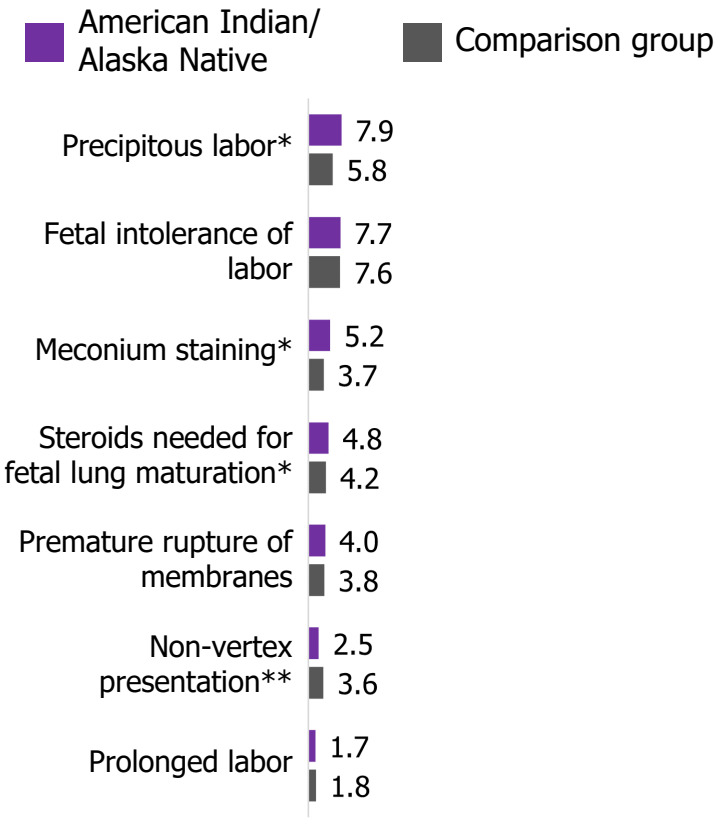
## Delivery complications

Medical complications during delivery may contribute to mortality among low birthweight infants.

Diagnosed conditions during delivery were not common. Precipitous labor, or rapid labor lasting under three hours, was the most common diagnosis and was more prevalent among American Indian/Alaska Native birthing parents than those in the comparison group. Fetal intolerance of labor was just as commonly diagnosed and was equally prevalent between populations.

When complications occur during delivery, it is important for parents to have access to necessary treatment and care to mitigate any risks to themselves or the infant.

### Percent diagnosed with conditions during delivery, 2015–2019




* Significantly higher for American Indian/Alaska Native 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 American Indian/Alaska Native 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, both having higher rates of low birthweight and higher mortality rates among low birthweight infants causes of excess deaths. **Focusing on preventing SUID, low birthweight, and mortality among low birthweight infants may help to reduce excess fetal and infant deaths and inequities impacting American Indian/Alaska Native communities in Wisconsin.**

When working to improve health outcomes, it is important to understand that 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 American Indian/Alaska Native 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.

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# 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 American Indian/Alaska Native population included those who identified as Hispanic and those who identified as American Indian/ Alaska Native and another 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 the American Indian/Alaska Native population across all categories and for the reference group for cause of death categories with the lowest rates. Caution should be exercised when interpreting estimates for each cause of death category.

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 not met for the American Indian/Alaska Native population. Caution should be exercised when interpreting birthweight distribution and birthweight-specific mortality rate estimates for the American Indian/ Alaska Native population.

# 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 |
| 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.[16] 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, 2011–2020**
By self-identified race and ethnicity of the parent that gave birth
*Data source: Wisconsin Linked Birth/Infant Death File*

| Year | Wisconsin statewide | American Indian/Alaska Native |
|---|---|---|
| | Rate (per 1,000 live births) | Rate (per 1,000 live births) |
| 2011–2013 | 6.0 | 7.4 |
| 2012–2014 | 5.8 | 5.6 |
| 2013–2015 | 5.8 | 8.4 |
| 2014–2016 | 5.9 | 8.7 |
| 2015–2017 | 6.1 | 12.0 |
| 2016–2018 | 6.2 | 9.8 |
| 2017–2019 | 6.1 | 10.0 |
| 2018–2020 | 6.0 | 6.9 |

**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 | American Indian/Alaska Native |
|---|---|---|
| | Percent | Percent |
| Birth defects | 20.5 | 10.1 |
| Short gestation or low birthweight | 19.5 | 15.9 |
| Maternal pregnancy complications | 5.6 | 4.4 |
| Unintentional injuries | 5.1 | 4.4 |
| Placenta, cord, or membrane causes | 4.0 | 2.9 |
| Circulatory | 2.2 | 5.8 |
| Other causes | 43.1 | 56.5 |

**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 | American Indian/Alaska Native | Comparison group[a] |
|---|---|---|
| | Rate (per 1,000 births and fetal deaths) | Rate (per 1,000 births and fetal deaths) |
| Total rate[b] | 11.0 | 4.7 |
| Maternal Health/Prematurity | 3.6 | 1.7 |
| Maternal Care | 1.7 | 1.2 |
| Newborn Care | 1.8 | 0.9 |
| Infant Health | 3.9 | 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

# Appendix

**Excess mortality rates and deaths for each perinatal period of risk among American Indian/Alaska Native 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 | Excess number of deaths |
|---|---|---|
| Total[b] | 6.3 | 42 |
| Maternal Health/Prematurity | 1.9 | 13 |
| Maternal Care | 0.4 | 3 |
| Newborn Care | 0.9 | 6 |
| Infant Health | 3.1 | 20 |

[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] | American Indian/Alaska Native | Comparison group[a] |
|---|---|---|
| | Rate (per 1,000 births and fetal deaths) | Rate (per 1,000 births and fetal deaths) |
| Sudden unexpected infant death (SUID) | 1.7 | 0.3 |
| Injuries | 0.6 | 0.1 |
| Infections | 0.3 | 0.1 |
| Birth defects | 0.3 | 0.2 |
| Other causes | 1.1 | 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 American Indian/Alaska Native 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 | Excess number of deaths |
|---|---|---|
| Sudden unexpected infant death (SUID) | 1.4 | 9 |
| Injuries | 0.6 | 4 |
| Infections | 0.2 | 2 |
| Birth defects | 0.1 | 1 |
| Other causes | 0.9 | 6 |

[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

| Birthweight grouping (grams) | American Indian/Alaska Native | Comparison group[a] |
|---|---|---|
| | Percent within birthweight grouping | Percent within birthweight grouping |
| 500–999 | 0.6 | 0.3 |
| 1,000–1,499 | 0.7 | 0.5 |

[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) | American Indian/Alaska Native | Comparison group[a] |
|---|---|---|
| | Rate (per 1,000 births and fetal deaths) | Rate (per 1,000 births and fetal deaths) |
| 500–999 | 0.5 | 0.3 |
| 1,000–1,499 | 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 American Indian/Alaska Native 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 | 500–999 | 0.89 |
| | 1,000–1,499 | 0.20 |
| Birthweight-specific mortality rates | 500–999 | 0.63 |
| | 1,000–1,499 | 0.18 |

[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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Baby most often placed to sleep on back only | 87.2 | (80.2–94.2) | 90.2 | (88.6–91.8) |
| Baby always slept alone in their crib or bed during past two weeks[c] | 57.4 | (45.1–69.7) | 67.9 | (65.1–70.7) |
| Baby crib or bed was placed in the same room where parents slept[c] | 87.8 | (79.4–96.2) | 68.4 | (65.6–71.2) |
| Baby usually slept in a crib, bassinet, or pack and play during past two weeks[c] | 85.6 | (77.3–93.8) | 92.5 | (91.0–94.1) |
| Baby usually slept in a sleeping sack or wearable blanket during past two weeks[c] | 32.4 | (21.7–43.0) | 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*

| | American Indian/Alaska Native | | 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 | 47.8 | (35.3–60.4) | 15.8 | (13.6–18.0) |
| Baby usually slept on couch, sofa, or armchair during past two weeks | 11.8 | (3.6–19.9) | 6.8 | (5.2–8.3) |
| Baby usually slept in infant car seat or swing during past two weeks | 41.2 | (28.9–53.5) | 48.8 | (45.8–51.8) |
| Baby usually slept with blanket during past two weeks | 59.3 | (47.0–71.7) | 37.3 | (34.4–40.3) |
| Baby usually slept with toys, cushions, or pillows (including nursing pillows) during past two weeks | 10.2 | (3.2–17.1) | 5.9 | (4.5–7.4) |
| Baby usually slept with mesh or non-mesh crib bumper pads during past two weeks | 11.2 | (3.4–19.0) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Told to place baby on back to sleep | 96.3 | (92.1–100.0) | 97.3 | (96.3–98.3) |
| Told to place baby in crib, bassinet, or pack and play | 89.7 | (82.2–97.2) | 92.0 | (90.3–93.6) |
| Told to place baby's crib or bed in room with parents | 45.9 | (33.5–58.2) | 53.2 | (50.3–56.1) |
| Told what things should and should not go in bed with baby | 91.5 | (84.6–98.3) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Percent | 95% C.I.[b] | Percent | 95% C.I.[b] |
| Smoked cigarettes at any time during pregnancy | 30.1 | (29.0–31.3) | 5.7 | (5.6–5.8) |
| Lived with someone who smoked cigarettes at time of birth | 33.2 | (32.1–34.4) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Smoked cigarettes during months following birth | 31.3 | (21.0–41.6) | 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–**

Among parents who smoked during the three months before pregnancy

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Quit smoking cigarettes during pregnancy | 48.1 | (31.9–64.3) | 46.0 | (39.3–52.6) |

[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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Other people around smoking | 61.2 | (42.7–79.8) | 68.9 | (61.8–76.0) |
| Cravings for cigarettes | 58.9 | (40.7–77.2) | 77.4 | (70.9–83.8) |
| Loss of way to handle stress | 53.2 | (34.4–72.0) | 69.8 | (62.7–76.9) |
| Worsening anxiety | 41.9 | (23.0–60.8) | 45.3 | (37.5–53.1) |
| Worsening depression | 32.3 | (14.7–49.9) | 28.5 | (21.3–35.7) |
| Lack of support from others to quit | 14.2 | (0.7–27.7) | 23.9 | (17.4–30.4) |
| Fear of gaining weight | 11.9 | (0.2–23.6) | 28.8 | (21.8–35.8) |
| Cost of medicines or products to help with quitting | 11.5 | (0.1–23.0) | 18.6 | (12.4–24.7) |
| Cost of classes to help with quitting | 5.6 | (0.0–13.9) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Marijuana or hash | 9.5 | (2.5–16.4) | 3.9 | (2.6–5.1) |
| Prescription pain relievers | 9.0 | (2.4–15.5) | 5.6 | (4.2–7.0) |
| Methadone, naloxone, subutex, or Suboxone | 1.8 | (0.0–5.2) | 0.8 | (0.2–1.4) |
| Heroin | 0.0 | (0.0–0.0) | 0.2 | (0.0–0.5) |
| Amphetamines | 0.0 | (0.0–0.0) | 0.5 | (0.1–0.9) |
| Cocaine | 0.0 | (0.0–0.0) | 0.4 | (0.0–0.9) |
| Tranquilizers | 0.0 | (0.0–0.0) | 0.2 | (0.0–0.6) |
| Hallucinogens | 0.0 | (0.0–0.0) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Asked if drinking alcohol | 98.6 | (95.8–100.0) | 97.1 | (96.1–98.2) |
| Asked if using substances such as marijuana, cocaine, crack, or meth | 87.9 | (79.7–96.1) | 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*

| | American Indian/Alaska Native | | 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) | 69.2 | (68.0–70.3) | 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*

| | American Indian/Alaska Native | | 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) | 79.8 | (70.8–88.8) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Hospital staff gave information about breastfeeding | 92.3 | (84.7–99.9) | 97.4 | (96.3–98.4) |
| Hospital staff helped parent learn how to breastfeed | 86.2 | (76.8–95.5) | 86.2 | (83.9–88.4) |
| Hospital staff told parent to breastfeed whenever baby wanted | 92.2 | (85.9–98.4) | 90.6 | (88.8–92.4) |
| Hospital gave a breast pump to use | 54.7 | (40.6–68.8) | 37.0 | (34.0–40.0) |
| Hospital gave a gift pack with formula | 30.2 | (16.9–43.6) | 24.0 | (21.3–26.6) |
| Hospital gave a telephone number to call for help with breastfeeding | 79.4 | (67.6–91.2) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Their doctor | 83.5 | (74.5–92.5) | 89.8 | (77.5–82.2) |
| A nurse, midwife, or doula | 70.8 | (59.4–82.1) | 79.2 | (76.8–81.6) |
| A breastfeeding or lactation specialist | 73.1 | (62.6–83.6) | 75.8 | (73.2–78.4) |
| Baby's doctor or health care provider | 75.4 | (64.7–86.2) | 70.2 | (67.5–73.0) |
| Breastfeeding support group | 24.9 | (13.9–36.0) | 20.6 | (18.1–23.0) |
| Breastfeeding hotline or toll-free number | 4.4 | (0.0–9.4) | 7.2 | (5.6–8.7) |
| Family or friends | 68.2 | (56.5–79.9) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Had a regular checkup at family doctor's office | 42.5 | (31.6–53.4) | 38.7 | (35.9–41.6) |
| Had checkup at OB/GYN's office | 24.1 | (14.1–34.1) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| No health insurance during month before pregnancy | 12.0 | (4.4–19.6) | 5.1 | (3.9–6.4) |
| No health insurance for prenatal care[c] | 2.4 | (0.0–5.6) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Percent | 95% C.I.[b] | Percent | 95% C.I.[b] |
| Adequate plus | 35.5 | (34.3–36.7) | 48.0 | (47.8–48.2) |
| Adequate | 29.2 | (28.1–30.3) | 40.6 | (40.4–40.8) |
| Intermediate | 8.3 | (7.6–8.9) | 3.1 | (3.0–3.2) |
| Inadequate | 25.0 | (23.9–26.0) | 8.1 | (8.0–8.2) |
| None | 2.1 | (1.7–2.4) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Did not get prenatal care as early as wanted | 21.1 | (12.1–30.2) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Couldn't get appointment when wanted | 40.3 | (17.9–62.7) | 45.0 | (36.5–53.5) |
| Didn't know that they were pregnant | 39.1 | (16.4–61.8) | 33.7 | (25.5–42.0) |
| Doctor or health plan would not start care as early as wanted | 32.5 | (7.4–57.6) | 39.5 | (31.4–47.6) |
| Didn't have any transportation to get to the clinic or doctor's office | 20.3 | (0.0–41.3) | 4.0 | (0.7–7.2) |
| Didn't want anyone else to know about pregnancy | 16.2 | (0.0–35.2) | 6.4 | (2.0–10.8) |
| Had too many other things going on | 16.1 | (0.0-–35.3) | 14.6 | (8.3–20.9) |
| Didn't have enough money or insurance to pay for visits | 9.9 | (0.0–20.3) | 17.0 | (10.6–23.3) |
| Didn't have Medicaid or BadgerCare Plus (ForwardHealth) card | 9.9 | (0.0–20.3) | 7.8 | (3.1–12.5) |
| Couldn't take time off from work or school | 9.5 | (0.0–27.6) | 8.9 | (3.9–13.9) |
| Didn't have anyone to take care of children | 0.0 | (0.0–0.0) | 6.5 | (2.2–10.9) |
| Didn't want prenatal care | 0.0 | (0.0–0.0) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Satisfied with wait time | 89.2 | (82.2–96.3) | 90.8 | (89.3–92.4) |
| Satisfied with the amount of time spent with the doctor, nurse, or midwife | 86.4 | (78.5–94.4) | 93.9 | (92.7–95.2) |
| Satisfied with the advice on how to take care of self | 88.4 | (81.0–95.9) | 93.9 | (92.6–95.2) |
| Satisfied with the understanding and respect shown toward them as a person | 95.2 | (90.3–100.0) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Had postpartum checkup 4–6 weeks after birth | 83.4 | (75.5–91.4) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Had too many things going on | 54.1 | (25.7–82.4) | 44.5 | (30.4–58.6) |
| Felt fine and did not think visit was needed | 46.0 | (18.0–74.1) | 28.9 | (16.4–41.4) |
| Couldn't get an appointment when wanted | 16.1 | (3.4–28.8) | 12.2 | (2.7–21.7) |
| Didn't have any transportation to get to clinic or doctor's office | 12.3 | (0.0–30.6) | 16.1 | (5.1–27.1) |
| Didn't have health insurance to cover the cost of the visit | 12.3 | (0.0–30.6) | 6.7 | (0.1–13.3) |
| Couldn't take time off from work | 8.2 | (0.0–24.3) | 8.8 | (1.4–16.3) |

[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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Living below federal poverty level at time of birth | 62.3 | (51.3–73.3) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Percent | 95% C.I.[b] | Percent | 95% C.I.[b] |
| Born preterm (< 37 gestational weeks) | 11.1 | (10.3–11.8) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Percent | 95% C.I.[b] | Percent | 95% C.I.[b] |
| Born at low birthweight (< 2,500 grams) | 7.9 | (7.2–8.5) | 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*

| | American Indian/Alaska Native | | 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 | 18.3 | (9.8–26.7) | 2.8 | (1.9–3.8) |
| Always, often, or sometimes felt unsafe in the neighborhood where they lived | 16.7 | (8.4–25.1) | 5.5 | (4.3–6.7) |
| Ate less than they felt they should because there wasn't enough money to buy food[c] | 17.4 | (7.8–27.1) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Moved to a new address | 51.6 | (41.0–62.1) | 28.1 | (25.7–30.5) |
| Argued with husband or partner more than usual | 28.0 | (18.4–37.6) | 16.0 | (14.0–18.1) |
| Someone very close to them passed away | 27.8 | (18.2–37.4) | 17.3 | (15.3–19.3) |
| Had problems paying the rent, mortgage, or other bills | 25.4 | (16.2–34.5) | 15.3 | (13.3–17.3) |
| Had a close family member who was very sick and had to go to the hospital | 30.3 | (20.7–40.0) | 24.9 | (22.7–27.2) |
| Lost their job even though they wanted to keep working | 16.4 | (8.5–24.2) | 4.9 | (3.7–6.1) |
| Husband or partner or themselves had a cut in work hours or pay | 14.5 | (6.7–22.3) | 14.0 | (12.1–15.8) |
| Someone very close to them had a problem with alcohol or substance use | 27.5 | (17.4–37.7) | 12.3 | (10.5–14.1) |
| Husband or partner lost their job | 7.0 | (1.2–12.7) | 7.2 | (5.7–8.7) |
| Husband or partner said they didn't want the birthing parent to be pregnant | 4.7 | (0.0–9.5) | 5.2 | (4.0–6.5) |
| Separated or divorced from husband or partner | 6.9 | (1.9–11.8) | 4.2 | (3.1–5.4) |
| Husband or partner or themselves went to jail | 15.8 | (7.6–24.1) | 2.5 | (1.6–3.3) |
| Was homeless or had to sleep outside in a car or in a shelter | 8.4 | (2.2–14.6) | 1.3 | (0.7–2.0) |
| Was apart from husband or partner due to military deployment or extended work-related travel | 4.8 | (0.6–9.0) | 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*

| | American Indian/Alaska Native | | 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 | 9.9 | (3.7–16.0) | 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 | 14.0 | (5.1–22.8) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Good, very good, or excellent general health before pregnancy | 89.6 | (83.5–95.6) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Percent | 95% C.I.[b] | Percent | 95% C.I.[b] |
| Diabetes | 2.4 | (2.0–2.7) | 0.7 | (0.7–0.8) |
| Hypertension[c] | 2.6 | (2.3–3.0) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Percent | 95% C.I.[b] | Percent | 95% C.I.[b] |
| Gestational diabetes | 8.4 | (7.7–9.1) | 6.3 | (6.2–6.4) |
| Gestational hypertension | 7.1 | (6.5–7.7) | 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*

| | American Indian/Alaska Native | | 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 | 29.6 | (16.2–43.0) | 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*

| | American Indian/Alaska Native | | 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 | 17.2 | (9.5–25.0) | 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*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Did not want to use birth control | 48.1 | (21.7–74.6) | 39.9 | (33.9–45.9) |
| Was not having intercourse | 37.4 | (13.0–61.8) | 23.2 | (17.9–28.4) |
| Worried about the side effects of birth control | 26.5 | (3.0–49.9) | 20.6 | (15.8–25.4) |
| Wanted to get pregnant | 25.9 | (4.3–47.5) | 26.8 | (21.4–32.2) |
| Husband or partner didn't want to use anything | 17.6 | (0.2–35.0) | 7.0 | (3.9–10.2) |
| Was currently pregnant | 6.5 | (0.0–19.1) | 0.3 | (0.0–0.9) |
| Had tubes tied | 4.7 | (0.0–14.1) | 5.6 | (2.7–8.6) |
| Had problems paying for birth control | 0.0 | (0.0–0.0) | 0.0 | (0.0–0.0) |

[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 were diagnosed with conditions during delivery by population, 2016–2019**

*Data source: Wisconsin Birth File*

| | American Indian/Alaska Native | | Comparison group[a] | |
|---|---|---|---|---|
| | Weighted percent | 95% C.I.[b] | Weighted percent | 95% C.I.[b] |
| Precipitous labor | 7.9 | (7.3–8.6) | 5.8 | (5.6–5.9) |
| Fetal intolerance of labor | 7.7 | (7.1–8.4) | 7.6 | (7.5–7.7) |
| Medium or heavy meconium staining | 5.2 | (4.7–5.8) | 3.7 | (3.7–3.8) |
| Required steroids for fetal lung maturation | 4.8 | (4.3–5.3) | 4.2 | (4.1–4.3) |
| Premature rupture of membranes | 4.0 | (3.5–4.5) | 3.8 | (3.7–3.9) |
| Non-vertex presentation | 2.5 | (2.1–2.9) | 3.6 | (3.5–3.7) |
| Prolonged labor | 1.7 | (1.4–2.0) | 1.8 | (1.7–1.9) |

[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