



SOUTH DAKOTA
DEPARTMENT OF HEALTH



SOUTH DAKOTA
**INFANT MORTALITY &
PREVENTION REPORT**
2016-2020

DECEMBER 2021

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Executive Summary

- From 2016-2020 there was an average of 77 infant deaths in South Dakota each year for an average infant mortality rate of 6.5 infant deaths per 1,000 live births.
- Although there has been a substantial decline in overall infant mortality rates in the last few decades, recent years show little progress in continuing to decrease the rate.
- Most infant deaths within the neonatal period (0-27 days old) are due to perinatal period conditions and congenital anomalies. Risk factors for these causes are closely related to maternal health including, but not limited to, prenatal exposure to tobacco smoke, alcohol, or drugs; untreated infections; gestational diabetes; insufficient prenatal care; low socioeconomic status; and intimate partner violence.
- Most infant deaths in the postneonatal period (28-364 days old) are related to infant sleep.
- Of the 95 sleep related deaths that occurred post-hospital discharge, nearly 80% occurred in an unsafe sleep environment.
- Wide disparities in infant mortality persist across races. From 2016-2020, White, non-Hispanic infants had an infant mortality rate of 5.5 while American Indian, non-Hispanic infants had a rate of 10.8.
- South Dakota Pregnancy Risk Assessment Monitoring System (PRAMS) data shows opportunities to improve maternal healthcare, decrease medical and behavioral risk factors, and increase protective factors, including the safety and well-being of mothers, which could improve outcomes for mothers and infants.
- South Dakota PRAMS data shows that while most mothers place their infants on their back to sleep, other safe sleep guidelines outlined by the American Academy of Pediatrics, such as sleeping without soft objects or loose bedding, are only being practiced in about half of South Dakota homes.
- The South Dakota Department of Health Office of Child and Family Services offers many programs and services aimed at improving the health of women and infants. These programs include Bright Start Nurse Visiting; Pregnancy Care Program; Family Planning; The Special Supplemental Nutrition Program for Woman, Infants, and Children; and Sexual Violence Prevention.

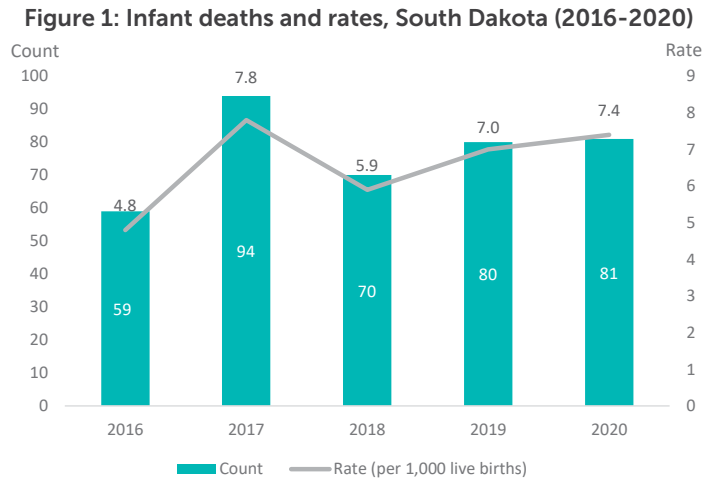
Of the **95** sleep-related deaths
that occurred post-hospital discharge,
nearly **80%** occurred in an
unsafe sleep environment

- South Dakota Department of Health conducts infant/child and maternal death reviews to understand the root causes of these deaths and inform data-driven prevention strategies.
- South Dakota COVID-19 supplemental PRAMS data shows the experiences of mothers during the COVID-19 pandemic in 2020.

Infant Mortality Rates and Causes

From 2016-2020 in South Dakota, an average of 77 infants died each year before their first birthday. South Dakota's average infant mortality rate per 1,000 live births from 2016-2020 was 6.5 (Figure 1).¹

FROM 2016-2020 IN SOUTH DAKOTA, AN AVERAGE OF 77 INFANTS DIED EACH YEAR BEFORE THEIR FIRST BIRTHDAY.



South Dakota's 2016-2020 infant mortality rate was higher than both the 2019 U.S. rate and the Healthy People 2030 goal (Table 1).

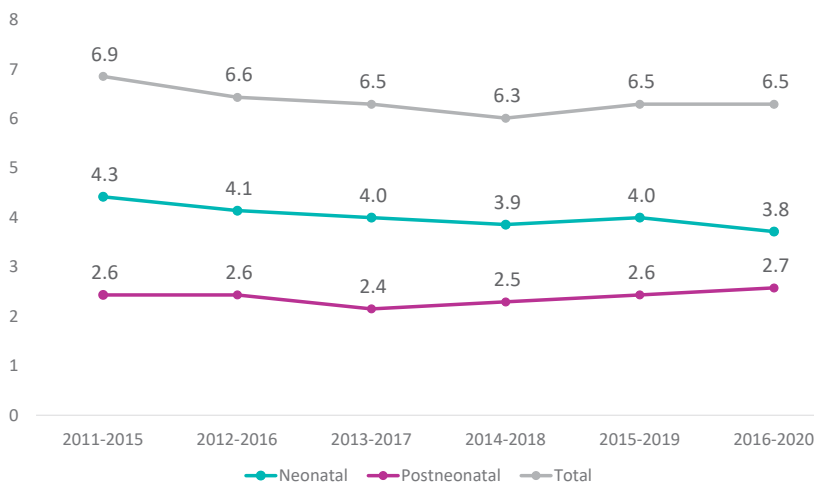
Table 1: South Dakota and United States infant mortality rate and Healthy People 2030 Goal

SD Rate (2016-2020) ¹	U.S. Rate (2019) ²	Healthy People 2030 Goal ³
6.5	5.6	5.0

Neonatal and Postneonatal Mortality

The neonatal mortality rate is the number of deaths to infants aged 0-27 days per 1,000 live births. The postneonatal mortality rate is the number of deaths to infants aged 28-364 days per 1,000 live births. Together, these make up the total infant mortality rate. Five-year averages show that South Dakota's neonatal mortality rate has been gradually decreasing over the last decade, while the postneonatal infant mortality rate has shown a slight increase in the past few years (Figure 2).¹

Figure 2: Neonatal, Postneonatal, and Total Infant Mortality Rates, 5 Year Averages (2011-2020)



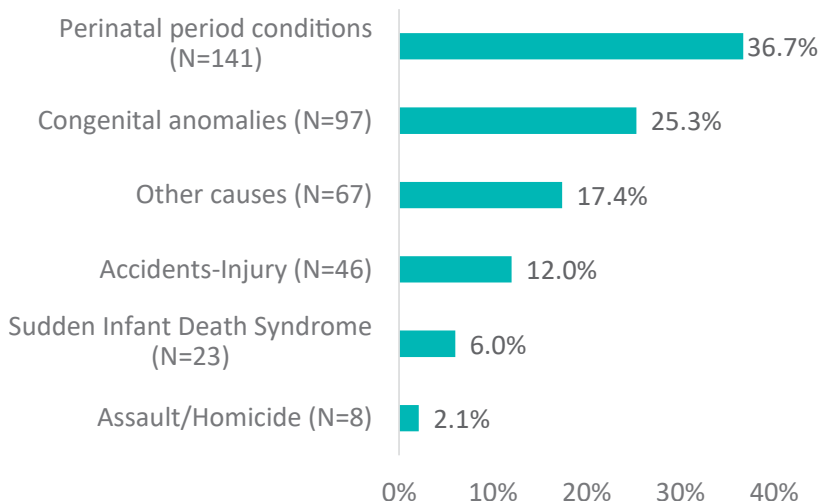
In this report, the infant causes of death are classified into seven broad categories of death. Each category has numerous ICD-10 codes which correspond to individual causes of death within these larger categories. Both the broad cause of death categories and more common specific causes are listed in Table 2. Table 2 also indicates the total number of infant deaths by cause, along with the breakdown of neonatal and postneonatal deaths by cause.

Table 2: Causes of Infant Deaths from (2016-2020)¹

Total Number of Deaths	Neonatal Deaths	Postneonatal Deaths	Cause of Death	Description of Causes
141	138	3	Perinatal period conditions	Most common causes include cardiovascular disorders originating in the perinatal period; disorders related to short gestation and low birth weight; complications of placenta, cord, and membranes; respiratory distress of newborn; and newborn affected by maternal complications of pregnancy.
97	72	25	Congenital anomalies	Most common causes include chromosomal abnormalities and congenital malformations.
67	9	58	Other causes	This category includes causes not found elsewhere such as diseases of the circulatory system, influenza and pneumonia, malignant neoplasms, and ill-defined and unknown causes of mortality.
46	2	44	Accidents-Injuries	Most common causes of injury were accidental suffocation and strangulation in bed and unspecified threat to breathing.
23	1	22	Sudden Infant Death Syndrome (SIDS)	SIDS refers to sudden deaths of an infant under one year of age that cannot be explained even after an investigation and autopsy.
8	1	7	Assault/Homicide	This category includes all assaults where the manner of death was homicide.
2	0	2	Undetermined	These deaths were categorized as "undetermined injury".

For a complete listing of the cause of death descriptions, refer to Cause of Death Explanations and ICD-10 Codes on [page 24](#).

Figure 3: Percent of Infant Deaths by Cause (2016-2020)¹



The percentage of total deaths by cause of death is shown in Figure 3. Perinatal period conditions and congenital anomalies made up the highest percentages of the infant deaths.

- 94% of neonatal deaths were due to conditions originating in the perinatal period and congenital anomalies.
- 35% of deaths described as perinatal period conditions were related to short gestation and low birth weight.
- 74% of accident-injury deaths were due to accidental suffocation and strangulation in bed
- 52% of deaths that were categorized as accidents-injury, Sudden Infant Death Syndrome, and other causes were associated with an unsafe sleep environment.*

*Deaths were assigned an ICD-10 code W75 (accidental suffocation and strangulation in bed) or terms listed under the cause of death on the death certificate included unsafe sleep position/environment, co-sleeping, overlay, or bed sharing.

Racial Disparities in Infant Mortality

Racial disparities in infant mortality exist nationally and within South Dakota. Health disparities are health differences that are closely linked to social, economic, and/or environmental disadvantage. A complex set of factors affect health, including genetics, individual behavior, access to and quality of health services, socioeconomic status, physical environment, discrimination, and health policies, along with others.⁴ The latest 5-year average for infant mortality shows a White, non-Hispanic infant mortality rate that is lower than all other racial and ethnic groups (Table 3).¹

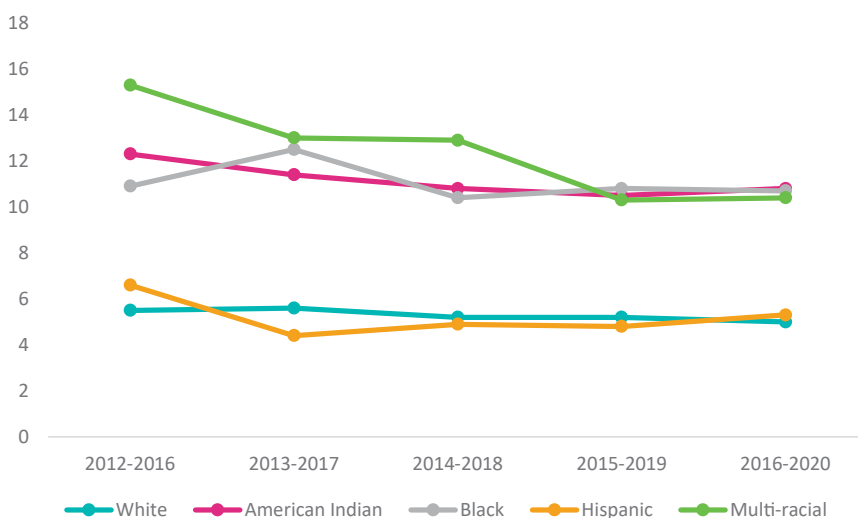
Table 3: Five-Year Infant Mortality Rates by Race (2012-2020)

Year	White, non-Hispanic	American Indian, non-Hispanic	Black, non-Hispanic	Hispanic	Multi-racial, non-Hispanic
2012-2016	5.0	12.3	*10.9	*6.6	15.3
2013-2017	5.2	11.4	12.5	*4.4	13.0
2014-2018	5.2	10.8	*10.4	*4.9	12.9
2015-2019	5.6	10.5	10.8	*4.8	10.3
2016-2020	5.5	10.8	10.7	*5.3	10.4

*Rates based on counts less than 20. Rates considered unstable and should be interpreted with caution.

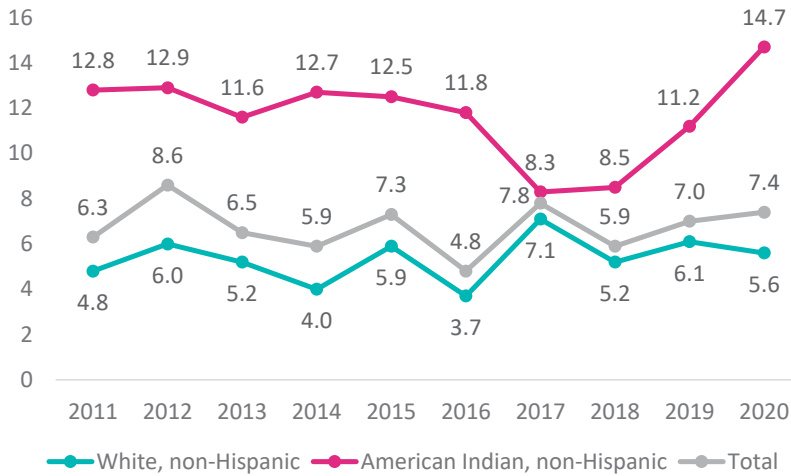
White and Hispanic infants have the lowest 5-year average rates for infant mortality, while American Indian, Black, and infants of two or more races have the highest rates (Figure 4).¹

Figure 4: Five-year Moving Average Infant Mortality Rates by Race, 2012-2020



In South Dakota, infant mortality rates of American Indian, non-Hispanic infants have historically been two to three times higher than that of White, non-Hispanic infants (Figure 5). However, overall trends in American Indian, non-Hispanic and multi-racial infant mortality rates have been decreasing over the past decade (Figure 4).¹

Figure 5: Infant Mortality Rates by Race and Hispanic Origin, 2011-2020



The seven general cause of death categories were further analyzed to dissect specific causes of deaths by race. The top three causes of death for American Indian and White infants are listed below.

Table 4: Top 3 Causes of Death by Race (2016-2020)¹

American Indian, non-Hispanic	White, non-Hispanic
1. Disorders related to short gestation and low birth weight (N=12)	1. Disorders related to short gestation and low birth weight (N=30)
2. Accidental suffocation and strangulation in bed (N=11)	2. Ill- defined and unknown causes of mortality* (N=19) *68% noted an unsafe sleep environment
3. Ill-defined and unknown causes of mortality* (tie with no. 2, N=11) *64% noted an unsafe sleep environment	3. Chromosomal abnormalities (N=18)

*Death records listed unsafe sleep position/environment, co-sleeping, overlay, or bed sharing as one of the preceding cause.

Reducing Infant Mortality in South Dakota: Driving Factors Behind the Leading Causes of Infant Deaths

The top causes of infant mortality are perinatal period conditions and congenital anomalies. While some perinatal period conditions and congenital anomalies cannot be prevented, addressing many of the known risk factors can lower the chance of complications for the newborn. Preventable risk factors for birth defects (a subset of congenital anomalies) and risk factors for intrauterine growth restriction and preterm birth (a major driver of perinatal period conditions) are noted below.

Risk Factors for Birth Defects^{5,6}

- Prenatal exposure to tobacco smoke, alcohol, or drugs
- Untreated infections
- Untreated gestational diabetes
- Insufficient prenatal care

Risk Factors for Intrauterine Growth Restriction and Preterm Birth^{5,7,8}

- Prenatal exposure to tobacco smoke, alcohol, or drugs
- Insufficient weight gain during pregnancy
- Low socioeconomic status
- Intimate partner violence
- Untreated chronic conditions, such as hypertension or diabetes
- Untreated intrauterine infections
- Preeclampsia
- Short (less than an 18-month) interval between pregnancies

Sleep-related circumstances are the leading factor in the other causes of South Dakota infant deaths. Data from the South Dakota Child Death Review shows that 67% of deaths occurring after hospital discharge were sleep related and out of those deaths, nearly 80% occurred in an unsafe sleep environment.⁹

The American Academy of Pediatrics has issued recommendations to reduce the risk of all sleep-related deaths, including Sudden Infant Death Syndrome (SIDS).¹⁰ In addition to four main sleep recommendations outlined on [page 18](#) of this report, other pre and post-natal recommendations include:¹⁰

- Avoiding smoke exposure during pregnancy and after birth
- Avoiding alcohol and illicit drug use during pregnancy and after birth
- Breastfeeding to lower risk of SIDS
- Immunizing infants in accordance with AAP and CDC recommendations

The next section of the report will highlight the South Dakota data behind these risk factors for mother and infant.

Maternal Healthcare

Maternal healthcare has implications for the health of infants. Preconception, prenatal, and postnatal care all make up a comprehensive model for addressing women's health.⁵

PRECONCEPTION CARE

Improving preconception health and access to health care can improve adverse maternal and infant health outcomes. Preconception health care promotes healthy behaviors before pregnancy to increase the chance of having a positive birth outcome and a healthy baby.⁵ In 2019, 72.5% of South Dakota mothers visited a health care worker before pregnancy, but only 22.8% of these mothers talked about preparing for a healthy pregnancy.¹¹

Preconception care is important for all women because many pregnancies are unplanned. In 2019, the overall prevalence of South Dakota mothers who had an intended pregnancy was 56.4% (Figure 6). A higher prevalence of intended pregnancy was associated with mothers who were White, non-Hispanic, between 30-34 years of age, had more years of education, were married and had greater household income compared with their counterparts (Figure 7).¹¹

Figure 6: Percent of South Dakota Mothers Who Had an Intended Pregnancy by Race. (2019)

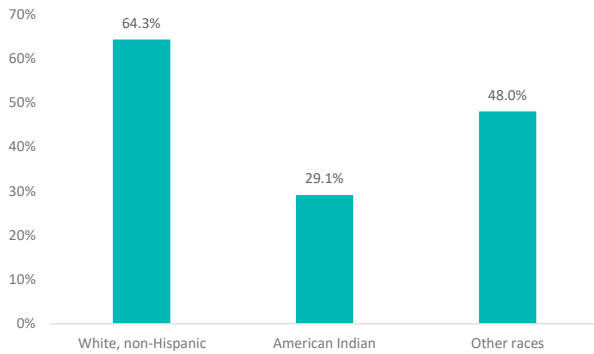
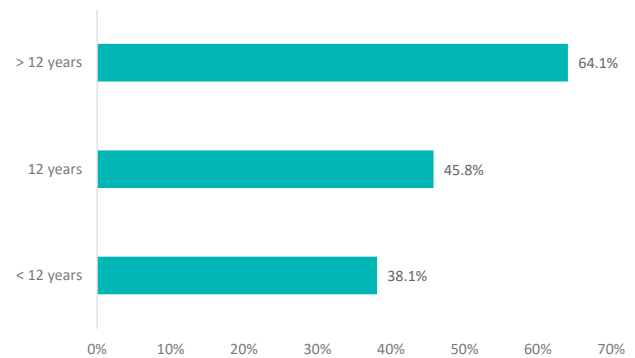
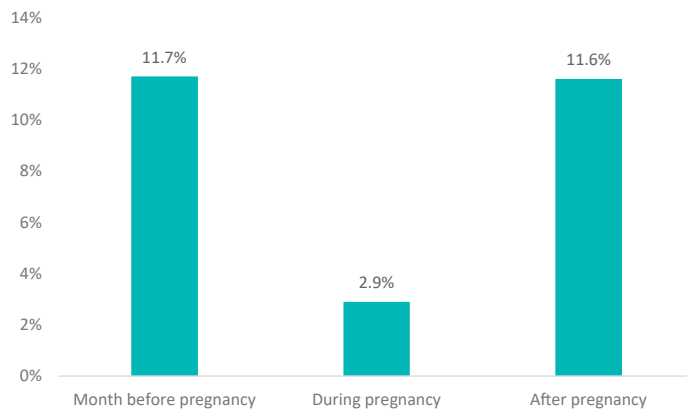


Figure 7: Percent of South Dakota Mothers Who Had an Intended Pregnancy by Education Level. (2019)



Lack of insurance coverage can prohibit some women from seeking care before and during pregnancy. Women who are uninsured before pregnancy are more likely to have preconception health risk factors and less likely to have health-promoting indicators.¹² The graph below shows the percent of South Dakota women who lacked insurance a month before pregnancy, during pregnancy, and after pregnancy (2-4 months postpartum) (Figure 8).¹¹

Figure 8: Percent of South Dakota Mothers Without Insurance Relative to Pregnancy Timing (2019)



Preconception care is an opportunity for women to talk to their providers about the timing of subsequent pregnancies. Short interpregnancy spacing, which is a pregnancy that occurs less than 18 months from one live birth or pregnancy loss to the start of the next pregnancy, increases the risk of preterm birth, low birth weight, still birth and birth anomalies.¹³ In 2019, 32.6% of South Dakota mothers reported 24 months or less from their last child to the birth of their most recent baby, indicating short interpregnancy spacing (Table 5).¹¹

Table 5: Among Women Who Had a Previous Birth, Age Difference Between Last Child and Most Recent Baby

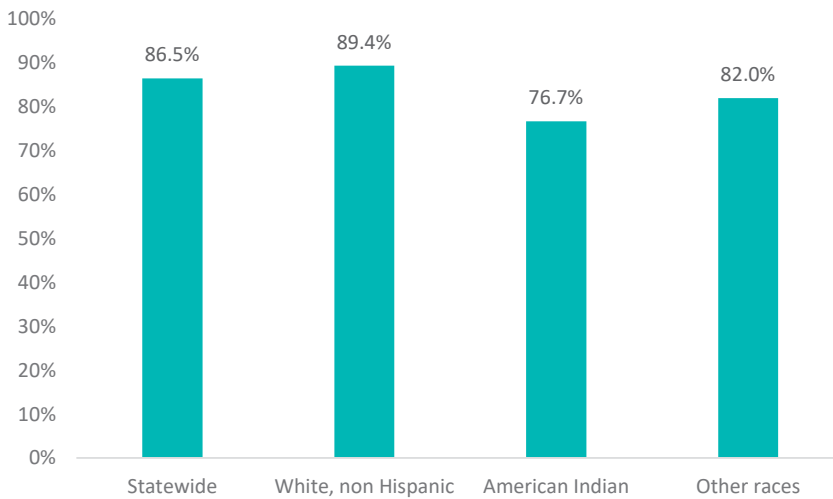
0 to 12 months	2.8%
13 to 18 months	12.2%
19 to 24 months	17.6%
2 to 3 years	24.5%
3 to 5 years	24.6%
More than 5 years	18.2%

PRENATAL CARE

Prenatal care allows healthcare providers to assess a woman's health and provide care that will reduce the risk of complications for the mother and infant.¹⁴ Infants whose mothers had no prenatal care are three times more likely to have a low birth weight and five times more likely to die during infancy.¹⁵

Overall, 86.5% of South Dakota mothers reported accessing prenatal care in the first trimester in 2019. However, this varied by race, with 89.4% of White, non-Hispanic mothers, 76.7% of American Indian mothers, and 82.0% of mothers of other races attending prenatal care (Figure 9).¹¹

Figure 9: Percent of South Dakota Mothers Who Accessed Prenatal Care in the First Trimester, by Race (2019)



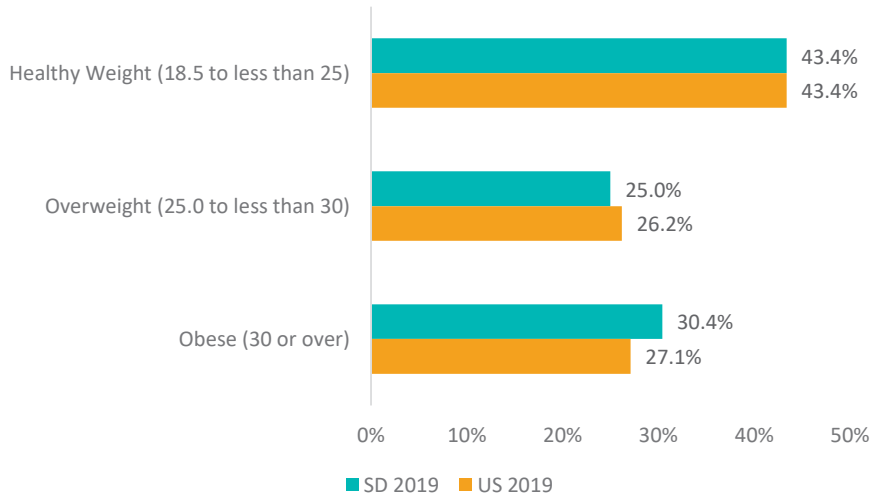
Among women who did not get prenatal care as early as they wanted, the top 6 barriers were:¹¹

1. Did not know she was pregnant (38.4%)
2. Could not get an appointment when she wanted (27.1%)
3. Had too many other things going on (23.9%)
4. Did not have transportation to get to the clinic or doctor's office (22.8%)
5. Doctor or health plan would not start care as early as wanted (22.4%)
6. Did not have enough money or insurance to pay for visits (17.0%)

Medical Risk Factors

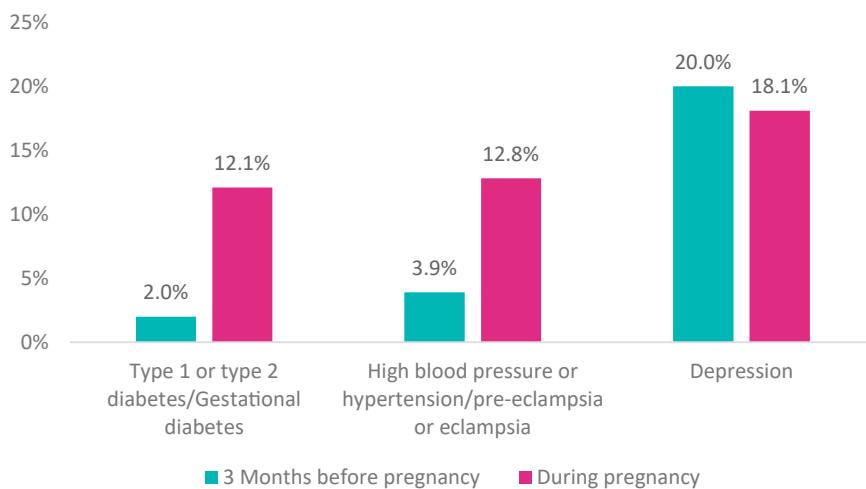
Prenatal care helps identify certain conditions and risk factors that can cause serious complications. One of these conditions, maternal obesity, can increase the risk of congenital malformations in the infant.⁵ Figure 10 shows the pre-pregnancy BMI for mothers in South Dakota.¹¹

Figure 10: Pre-pregnancy BMI in South Dakota Mothers (2019)



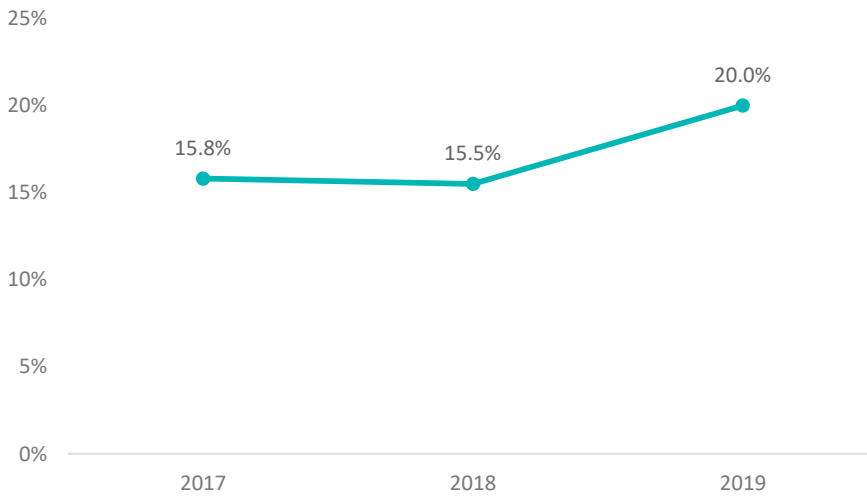
Having a healthy weight before conception can also help prevent gestational diabetes and maternal hypertension. Mothers with gestational diabetes have a higher risk of having infants with large for gestational age, congenital heart disease, and premature birth.⁵ Hypertension during pregnancy is linked to fetal growth restriction and preterm birth.¹⁶ Figure 11 shows the percent of mothers with these medical risk factors before and during pregnancy.¹¹

Figure 11: Percent of Mothers with Medical Risk Factors Before and During Pregnancy (2019)



Untreated depression during pregnancy has been associated with increased risks of preterm birth and low birth weight.¹⁷ Rates of depression have increased over time, from 15.5% in 2017 to 20.0% in 2019 (Figure 12).¹¹

Figure 12: Percent of Mothers with Depression Before Pregnancy (2017-2019).



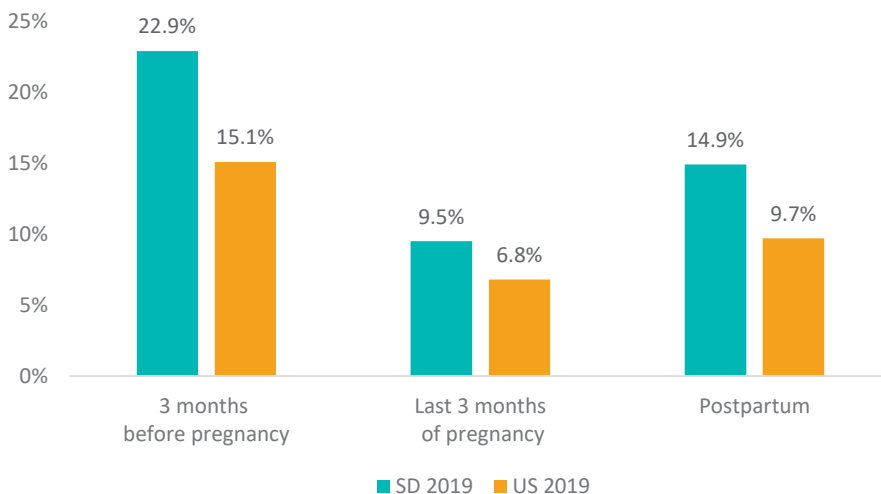
Behavioral Risk and Protective Factors

Some of the risk factors for infant mortality are behavioral and can be prevented, although factors such as substance misuse are complex and require multifaceted approaches.

SMOKING

Smoking during pregnancy increases the risk of preterm birth, low birth weight, and birth defects of the mouth and lip. Smoking during and after pregnancy is also a risk factor for Sudden Infant Death Syndrome.¹⁸ The percentage of South Dakota mothers smoking during the three months before pregnancy, the last three months of pregnancy, and postpartum is higher than the national rates (Figure 13).¹¹

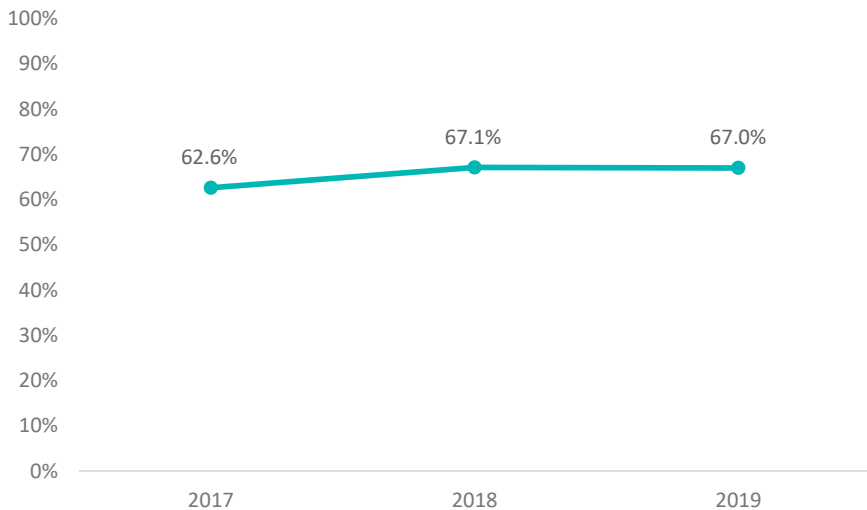
Figure 13: Percentage of Mothers Smoking Before, During, and After Pregnancy (2019)



ALCOHOL

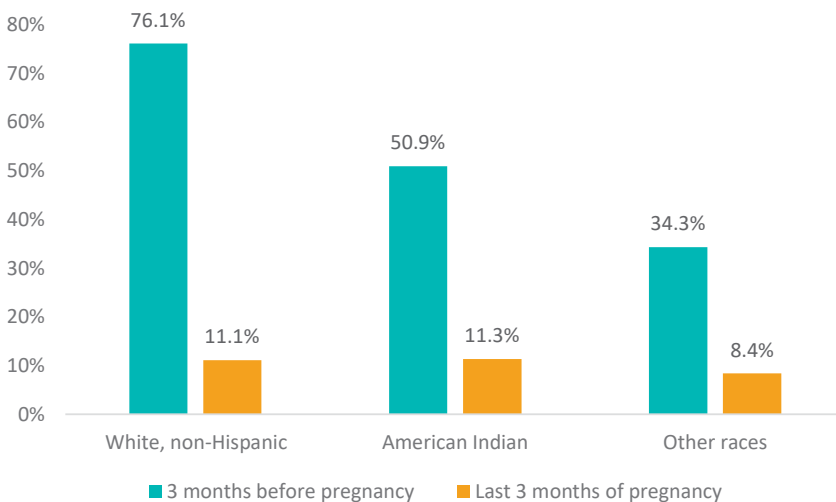
There is no safe amount of alcohol to drink during pregnancy. Drinking alcohol during pregnancy can cause miscarriage, stillbirth, and fetal alcohol spectrum disorders which are physical, behavioral, and intellectual disabilities.^{18,19} Consuming alcohol before pregnancy has also been associated with fetal growth issues.²⁰ The percentage of South Dakota mothers who drank alcohol three months before pregnancy has increased slightly over time (Figure 14).¹¹

Figure 14: Alcohol Use Three Months Before Pregnancy (2019)



Mothers who were White, non-Hispanic, between 30-34 years of age, had more years of education, were married, and had greater household income had a higher prevalence of drinking alcohol the three months before pregnancy (Figure 15). There were no significant differences in alcohol consumption during the last three months of pregnancy by demographic characteristics.¹¹

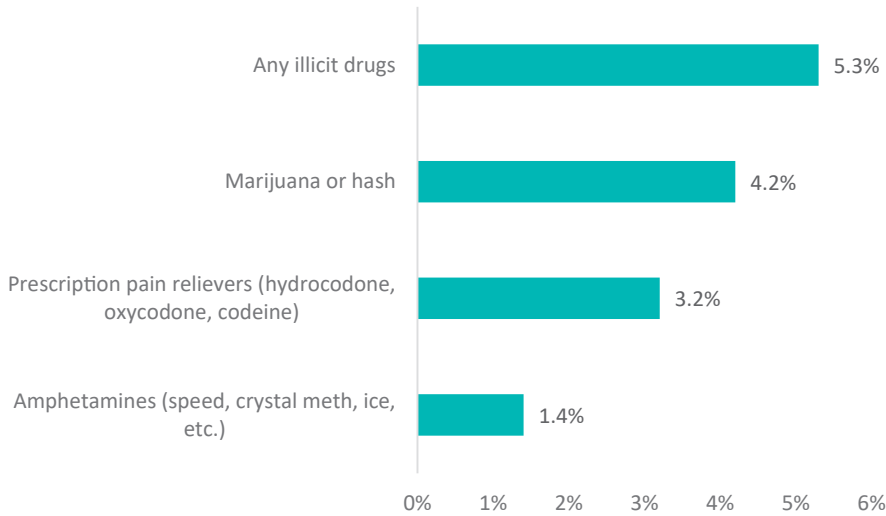
Figure 15: Alcohol Use Before and During Pregnancy by Race (2019)



DRUG USE

Drug use during pregnancy can cause adverse maternal and infant outcomes. 5.3% of South Dakota mothers reported using any illicit drugs during pregnancy. 4.2% reported using marijuana or hash and 3.2% reported using a prescription pain reliever (Figure 16).¹¹ Using prescription pain relievers during pregnancy can cause negative health effects for the infant such as neonatal opioid withdrawal syndrome, preterm birth, poor fetal growth, and stillbirth. It is important for mothers to have a conversation with their providers about the best way to manage pain and how to weigh the risks and benefits of opioid use during pregnancy.¹⁸

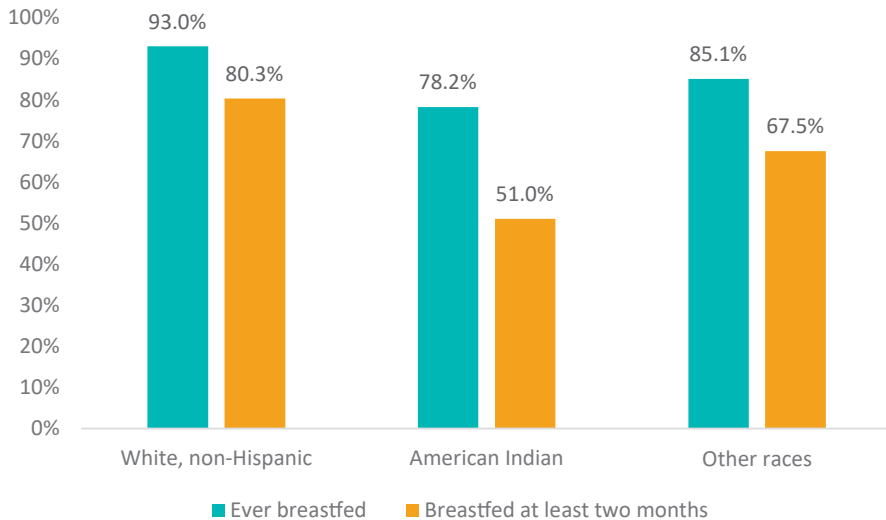
Figure 16: Drug Use During Pregnancy (2019)



BREASTFEEDING

Breastfeeding is a protective factor for adverse infant outcomes. Infants who are breastfed have reduced risks of infections and chronic diseases such as asthma, Type 1 diabetes, severe lower respiratory disease, and ear infections. Breastfeeding also decreases the risk of sudden infant death syndrome.²¹ In 2019, 89.7% of South Dakota mothers reported ever breastfeeding or pumping milk to feed their new baby. The percentage of mothers breastfeeding at least two months is lower for all races (Figure 17).¹¹

Figure 17: Infants Ever Breastfed and Breastfed at Two Months (2019)



Safety and Well-Being

Experiencing intimate partner violence (IPV) during pregnancy is associated with numerous pregnancy-specific behaviors that are risk factors for poor maternal and infant health outcomes. Women experiencing intimate partner violence are more likely to delay prenatal care initiation or miss prenatal visits. Lack of prenatal care has been linked to higher rates of preterm delivery and low birth weight infants. Poor nutrition, inadequate weight gain during pregnancy, and higher rates of smoking, alcohol, and substance use have also been associated with experiencing intimate partner violence during pregnancy.²² Table 6 shows the type of abuse experienced by South Dakota women during pregnancy.¹¹

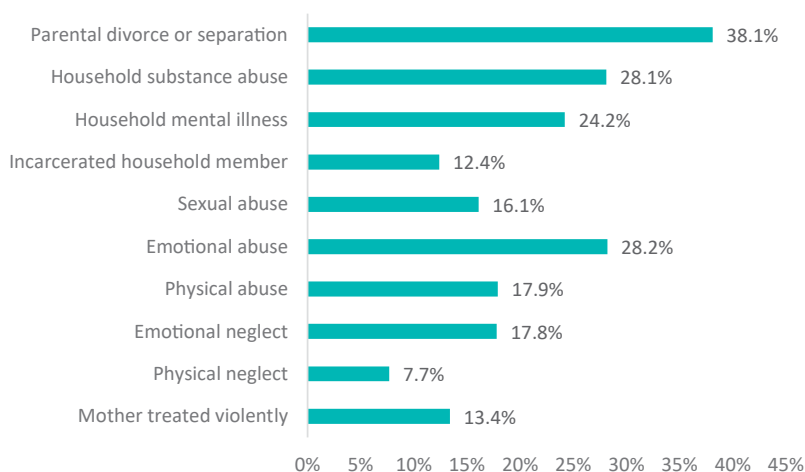
Table 6: Types of Abuse Experienced During Pregnancy (2019)

Types of Abuse	SD	U.S.
Experienced IPV during the 12 months before pregnancy by a husband or partner and/or an ex-husband or partner	2.8%	3.0%
Experienced IPV during pregnancy by a husband or partner and/or an ex-husband or partner	1.7%	2.0%
Experienced sexual abuse during pregnancy	1.6%	N/A
Experienced emotional abuse during pregnancy	6.7%	N/A

ADVERSE CHILDHOOD EXPERIENCES

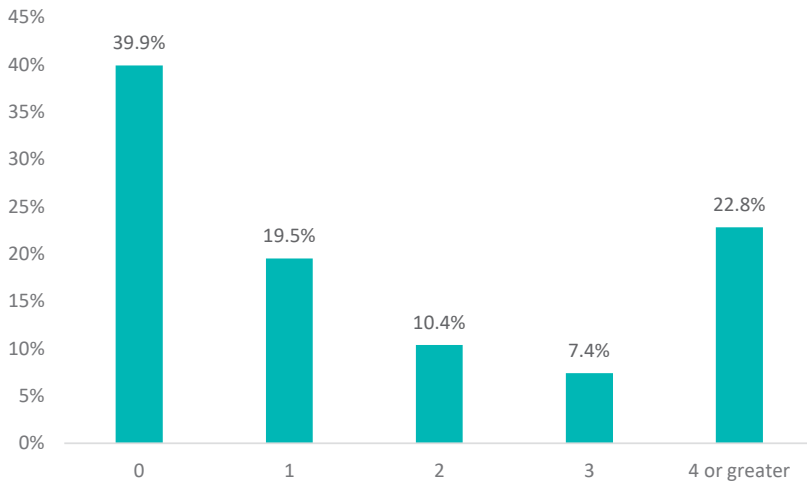
Adverse Childhood Experiences (ACEs) are potentially traumatic events that occur in childhood (0-17 years). Different types of abuse, neglect, and violence are some of the events that make up ACEs. Experiencing ACEs as a child is linked to adult health problems such as chronic health issues, mental illness, and substance use. ACEs also increase the risk for teen pregnancy, pregnancy complications and fetal death.²³ The percent of South Dakota mothers who experienced specific adverse childhood experiences are shown in Figure 18.¹¹

Figure 18: Adverse Childhood Experiences by Type of Event (2019)



Women who experienced 4 or more ACEs are more likely to experience health problems. Research suggests that having a high ACE score (4 or more ACEs) is associated with an increased risk of hypertensive disorders of pregnancy and preterm birth.²⁴ Figure 19 shows that 22.8% of South Dakota mothers had an ACE score of 4 or greater. When compared with mothers who did not have a high ACE score, mothers with a high ACE score were more likely to report that they were uninsured before pregnancy (17.8% vs. 9.6%), they smoked three months before pregnancy (46.2% vs. 16.3%), they attended fewer than 80% of their prenatal visits (21.4% vs. 14.2%) and they had diabetes, hypertension, or depression diagnosed during pregnancy (48.5% vs. 29.8%).¹¹

Figure 19: Cumulative ACE Scores Among Pregnant Women (2019)

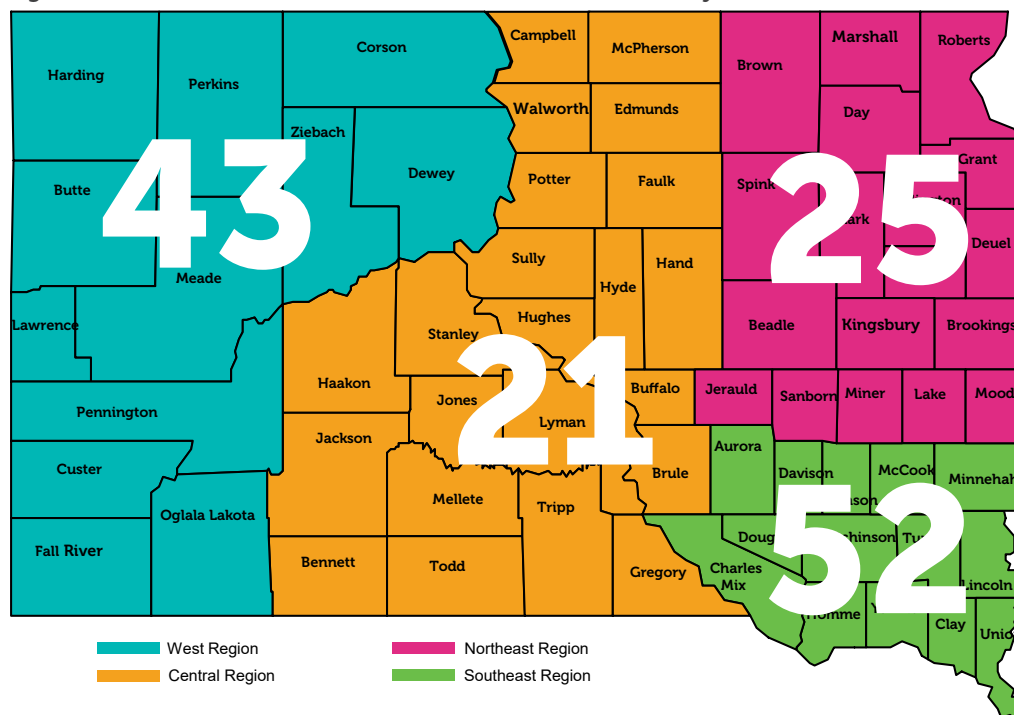


Sleep-Related Infant Deaths: Data from the South Dakota Child Death Review

In 2013, a statewide infant death review initiative was launched. Two multi-disciplinary teams, one east river and one west river, assemble every four months to review post-hospital discharge deaths of infants under the age of one. In 2020, the team expanded to review child deaths through the age of 12. Infant death findings from the committee are explained below.

From 2016-2020, 141 infants died after hospital discharge and 95 were found to be sleep-related.⁹ See numbers by OCFS region in Figure 20 .

Figure 20: Number of Deaths in each Office of Child and Family Services Public Health Service Areas (N=141)

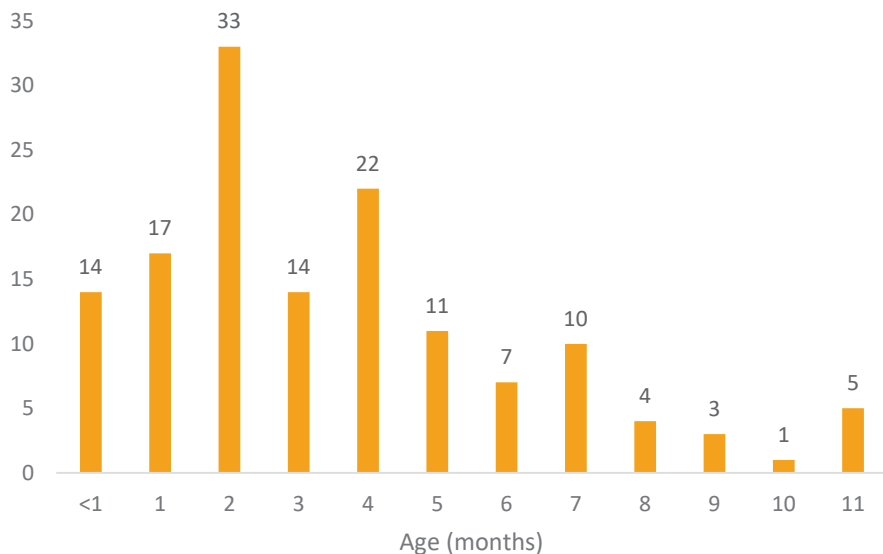


Of the 95 sleep related deaths:

- 55 babies were found in an adult bed
- 11 babies were in a crib
- 10 babies were on a couch
- 19 were in other locations such as car seats, bassinets, bouncy chairs, the floor, Rock ‘n Play, changing mat wedge, or rocker chair.

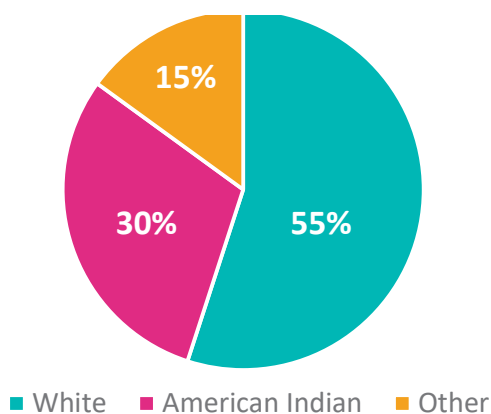
Most post-hospital discharge infant deaths occur in the first seven months of life. Figure 21 shows the infant deaths by age in months.⁹

Figure 21: Number of Post-Hospital Discharge Infant Deaths by Age (2016-2020)



Thirty percent of the post-hospital discharge infant deaths are American Indian infants, while approximately 14% of total births are to American Indian mothers (Figure 22).⁹

Figure 22: Percent of Post-Hospital Discharge Infant Deaths by Race (2016-2020)



***“Other” denotes infants of all other races, including multi-racial.*

Safe Sleep Practices in South Dakota

Many of the recommendations coming from the South Dakota Child Death Review Committee focus on safe sleep education and following safe sleep practices. The American Academy of Pediatrics gives recommendations to reduce the risk of sleep-related deaths in infants. These recommendations include placing the infant on their back to sleep, using a firm sleep surface, room-sharing with the infant on a separate sleep surface, and a sleep surface free of soft objects and bedding.¹⁰ The figures below show the percent of South Dakota mothers following these four recommendations.¹¹

**NEARLY 8 OUT OF 10
INFANT DEATHS
OCCURRED IN AN UNSAFE
SLEEP ENVIRONMENT**

Figure 23: Mothers Who Laid Their Infant to Sleep on Their Back (2019)

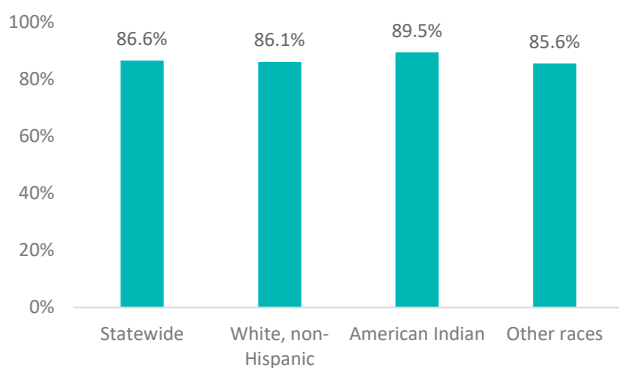


Figure 24: Mothers Who Placed Their Infant on an Approved Sleep Surface (2019)

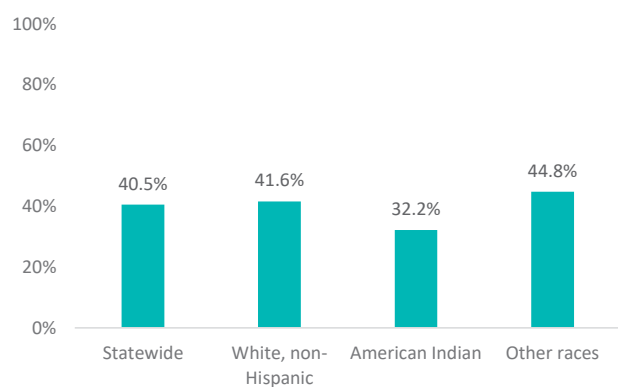


Figure 25: Mothers Whose Infant Slept Without Soft Objects or Loose Bedding (2019)

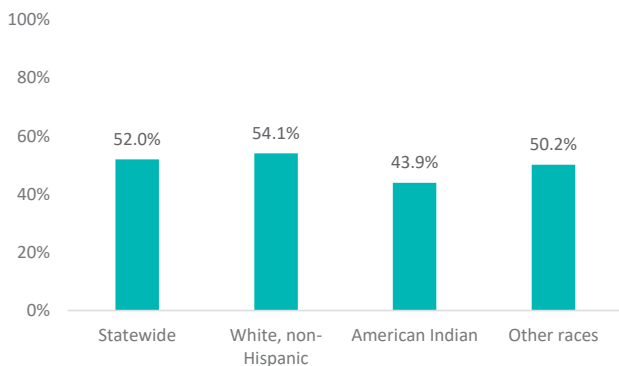
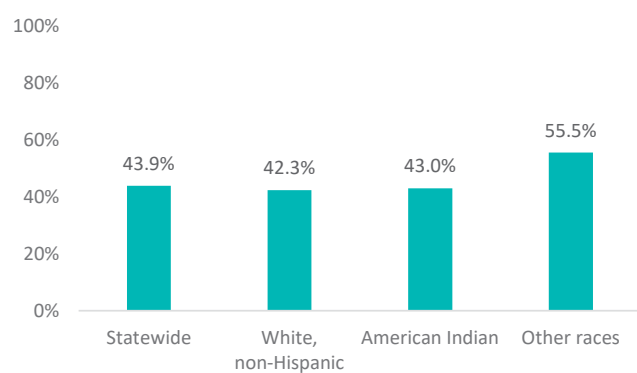


Figure 26: Mothers Whose Infant Room-Shared Without Bed-Sharing (2019)



Moving Data to Action

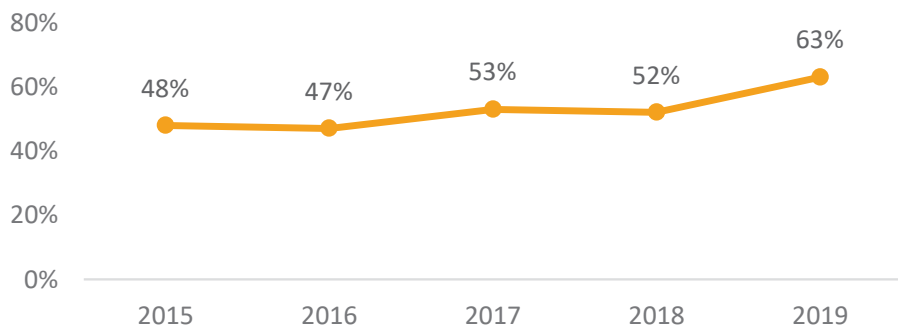
Stories from the Child Death Review (CDR)

Story #1: CDR data shows that almost 80% of infant deaths occurred when the infant was in the care of mom, dad, or mom's partner. The Maternal Child Health Safe Sleep workgroup decided to target safe sleep education to these caregivers by partnering with the National Cribs for Kids program and all SD birthing hospitals to promote safe sleep certification within their system (bronze, silver, or gold level). The certification ensures that all families hear the safe sleep message before leaving the hospital after birth.

Story #2: Based on CDR data regarding racial disparities, the Maternal Child Health Safe Sleep workgroup's strategy was to disseminate culturally appropriate safe sleep educational materials, resources, and messages via social media, print, and radio. The safe sleep messages were promoted in reservation communities and used Native American families in Facebook posts (example below).



Story #3: CDR data shows an increase in percentage of infant deaths occurring in an adult bed.



This increase prompted the creation of the following Facebook post linked to discussion of safe sleep on For Baby's Sake website.



It's good for baby to share your room, but NOT your bed. Research shows parents and caregivers CAN help reduce the risk of SIDS and other sleep-related infant deaths by following established safe sleep guidelines. For more, visit ForBabySakeSD.com/safe-sleep-guidelines.

Office of Child and Family Services Program Highlights

BRIGHT START NURSE VISITING

In South Dakota, the Office of Child and Family Services' Bright Start program supports families during pregnancy and their child's first three years. Bright Start pairs specially trained nurses with new families to work to improve pregnancy outcomes, child health and development, and family self-sufficiency. Nurses and families meet during home, community-based, or telehealth visits about every other week throughout their 2.5-3 year participation in the program. Nurses implement the evidence-based Nurse-Family Partnership curriculum and interventions. In July of 2014, JAMA Pediatrics published a study that found for participants in Nurse-Family Partnership, there were lower rates of preventable causes of death among children from birth to age 20. Nurses work with parents to identify and decrease the risk of a wide variety of child safety concerns, as well as educate families on child development. Improved caregiver understanding of a child's developmental capabilities can decrease both unintentional injuries and child maltreatment.

PREGNANCY CARE PROGRAM

The SD Department of Health's Pregnancy Care Perinatal Services Program provides risk assessment of women and subsequent modified case management for those women found eligible for services. The risk assessment is comprised of chronic, and pregnancy induced risk factors as well as social determinants of health. Modified case management involves RN's providing ongoing assessment, perinatal education, and support throughout the pregnancy and up to three months postpartum. Other services include screening for depression, safe sleep education, breastfeeding education and referrals to community-based resources based on the mother's identified risks and factors as they arise in pregnancy.

FAMILY PLANNING

SD Family Planning Program (SDFPP) delivers statewide through a network of 22 sites. Quality Family Planning services are provided but are not limited to: Contraceptive services for clients who want to prevent pregnancy and space births; Pregnancy testing and counseling; Assistance to achieving pregnancy; Basic infertility services; Preconception health (includes screening for obesity, smoking, and mental health); and sexually transmitted disease services (including HIV/AIDS). Services are offered to clients on a sliding fee scale, and if the client makes at or below

100% of the Federal Poverty Guidelines, the services will be at no cost. In addition, the SDFPP encourages family participation in the minor's decision to seek assistance and counsels clients on resisting attempts to coerce them into engaging in sexual activities. In the 2020 grant year, the SDFPP provided services to over 4500 clients statewide.

THE SPECIAL SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS, AND CHILDREN (WIC)

WIC is a nutrition and breastfeeding education and counseling program that helps to improve healthy lifestyle choices, promote sound food buying habits, and provide referrals to community agencies, social programs, and preventative health. The supplemental food quantities and types are designed to address inadequate and excessive nutrient intake, contribute to an overall dietary pattern consistent with national nutrition guidelines for adults, toddlers, and infants, and deliver priority nutrients to participants to meet their supplemental nutrition needs.

WIC improves the health of mothers, children and babies and reduces health care costs. In South Dakota, WIC is administered by the Department of Health and the Office of Child and Family Services. This partnership allows WIC clinics to be co-located with other health services, which promotes collaboration with essential health services and immediate referrals to services. Other benefits of WIC include healthy birth outcomes, increased breastfeeding rates, adequate growth and development, increased consumption of key nutrients/increased density in diet, decreased prevalence of anemia, and improved likelihood of immunization.



SEXUAL VIOLENCE PREVENTION

The Rape Prevention Education (RPE) program provides education, programming and training aimed at preventing sexual violence before it occurs. The target populations for the program are youth, adolescents, and young adults. The programming that youth receive not only contains sexual violence prevention, but also healthy relationships, boundaries, and consent education. By teaching and fostering these protective factors early, it lessens the likelihood of violence and poor health outcomes later in life.

CRIB DISTRIBUTION IN COMMUNITY HEALTH OFFICES

The South Dakota Department of Health partners with the National Cribs for Kids program to distribute safe sleep kits (includes a Pack 'n Play) through their Community Health Offices and partners. Over 1,000 kits are distributed each year to families in need of a safe place for baby to sleep.

CHILD DEATH REVIEW

The South Dakota Child Death Review looks at cases of statewide infant deaths that occur post-hospital discharge with the goal of understanding why infants die to prevent future deaths. There are currently two review teams in the state, East River Team (reviews deaths that occur in the 44 counties east of the Missouri River) and the West River Team (reviews deaths that occur in the 22 counties west of the Missouri River). The teams are multidisciplinary and are comprised of volunteers from law enforcement, Child Protection Services, hospital staff, fire departments, emergency medical services, public health, behavioral health, forensic pathology, the Bureau of Indian Affairs, Indian Health Services, Great Plains Tribal Leader's Health Board, and States Attorney office.

MATERNAL MORTALITY REVIEW COMMITTEE

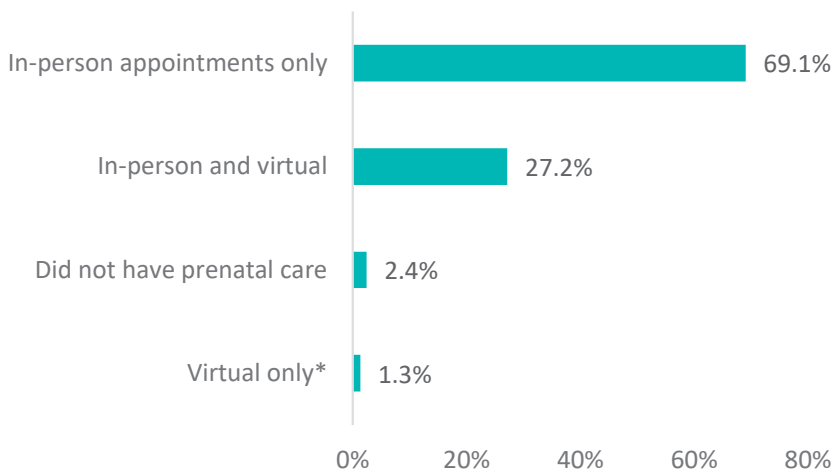
The South Dakota Maternal Mortality Review Committee is a multi-disciplinary group of volunteer health care providers and public health practitioners who review maternal deaths (deaths that occur up to one year after pregnancy). Vital records, hospital and law enforcement records, and informant interviews give a complete picture of the circumstances surrounding the maternal deaths. The committee discusses prevention strategies and recommendations to improve maternal health and prevent future morbidity and mortality.

Experiences of Mothers During the COVID-19 Pandemic

SD PRAMS collected supplemental data from July through December 2020 on mothers' experiences during the COVID-19 pandemic.

Mothers were asked what types of prenatal care appointments they attended. A majority (69%) attended in-person appointments only, while 27.2% of mothers attended both in-person and virtual appointments (Figure 27).¹¹

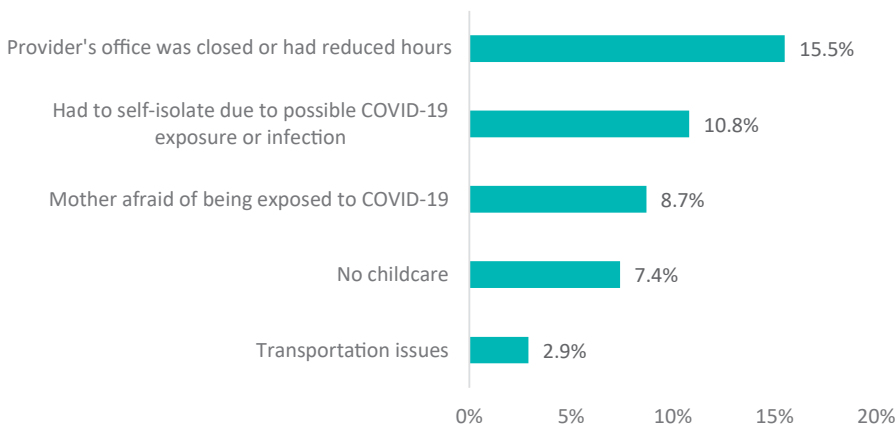
Figure 27: Types of Prenatal Care Appointments Attended During the COVID-19 Pandemic (2020)



**too few cases to meet precision standard. Interpret with caution.*

Mothers who indicated that prenatal care appointments were delayed or canceled responded that this was most often because the provider's office was closed or had reduced hours (Figure 28).¹¹

Figure 28: Reasons for Prenatal Care Appointments Being Canceled or Delayed During the COVID-19 Pandemic (2020)



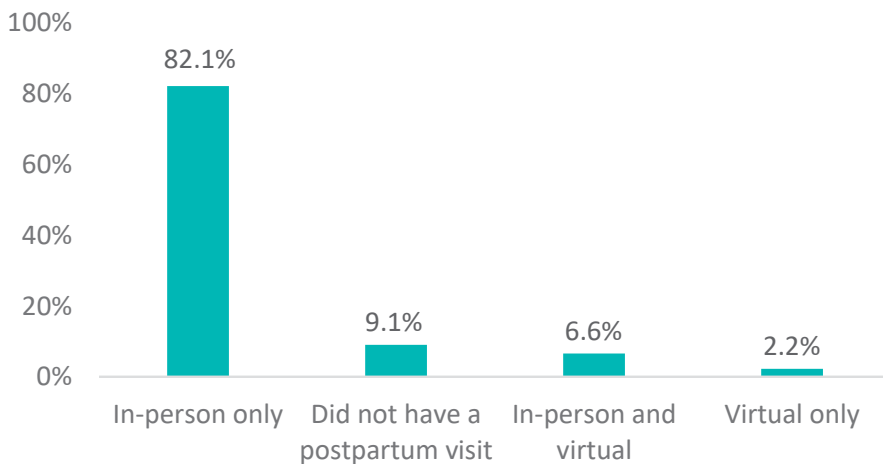
Mothers were asked about how the COVID-19 pandemic affected the baby’s routine health care. 8.8% of mothers said that immunizations were postponed and 6.6% said that well visits or checkups were canceled or delayed (Table 7).¹¹

Table 7: Ways that the COVID-19 Pandemic Affected the Baby’s Routine Health Care (2020)

Well visits or checkups were canceled or delayed	6.6%
Well visits or checkups were changed to virtual	4.4%
Immunizations were postponed	8.3%

Mothers were asked what type of postpartum appointments they attended during the COVID-19 pandemic. 82.1% responded that they had in-person only appointments and 9.1% did not attend a postpartum visit (Figure 29).¹¹

Figure 29: Types of Postpartum Appointments Attended (2020)



Mothers were asked about a variety of experiences and situations that they faced due to the COVID-19 pandemic. 53.0% of mothers reported that they experienced anxiety, 30.4% reported spending more time caring for children or family, and 26.4% reported depression (Table 8).¹¹

Table 8: Experiences of Mothers Due to the COVID-19 Pandemic (2020)

Anxiety	53.0%
More time caring for children or family	30.4%
Depression	26.4%
Lost job or pay	23.2%
Problems paying bills	22.4%
Increase in verbal arguments	18.9%
Difficulties due to loss of childcare	18.0%
Food insecurity	17.9%
Other members of household lost job or pay	16.2%
Received unemployment	15.6%
Had to move	6.8%
Increase in physical, sexual, and emotional aggression	4.7%

Data Sources and Methodology

South Dakota Department of Health Vital Statistics Data: The mortality rates and cause of death data used in this report comes from the Office of Health Statistics vital statistics data. Cause of death categories may be different from those produced for the Vital Statistics Reports due to the use of different International Classification of Diseases (ICD-10) code groupings. Vital statistics prenatal care data may be different than the data presented in this report from PRAMS due to differences in data collection methods.

South Dakota Child Death Review Data: Abstracted from birth and death certificates, hospital and clinic records, law enforcement, and social service records.

Pregnancy Risk Assessment Monitoring System (PRAMS): South Dakota Pregnancy Risk Assessment Monitoring System (PRAMS) is a surveillance project of the Centers for Disease Control and Prevention (CDC) and state health departments. It collects state-specific, population-based data on maternal attitudes and experiences before, during, and shortly after pregnancy. For more information on South Dakota PRAMS, visit: <https://doh.sd.gov/statistics/prams.aspx>

Table 9: Cause of Death Explanations and ICD-10 Codes

Cause of Death	Explanation	ICD-10 Codes
Conditions originating in the perinatal period	Referred to as “perinatal period conditions” throughout the report for ease of reading. This category includes respiratory distress of newborn, disorders related to short gestation and low birth weight (not elsewhere classified), newborn affected by maternal complications of pregnancy, pulmonary hemorrhage and cardiovascular disorders originating in the perinatal period, hydrops fetalis not due to hemolytic disease, atelectasis, neonatal aspiration syndromes, congenital viral diseases, bacterial sepsis of newborn, necrotizing enterocolitis of newborn, hematological disorders, intrauterine hypoxia and birth asphyxia, slow fetal growth and fetal malnutrition, newborn affected by complications of placenta, cord, and membranes, neonatal hemorrhage, complications of labor and delivery, neonatal cerebral ischemia, and other complications of maternal disorders.	P00-P96
Congenital malformations, deformations, and chromosomal abnormalities	Referred to as “congenital anomalies” throughout the report for ease of reading. This category includes congenital malformation unspecified, chromosomal abnormalities, congenital malformations of the digestive system, nervous system, heart, or respiratory system. Congenital malformations and deformations of the musculoskeletal system, limbs, and integument.	Q00-Q99
Accidents (unintentional injuries)	This category includes accidental suffocation and strangulation in bed, transport accident, unspecified threat to breathing, fall, drowning, accidental inhalation and ingestion of food or other objects causing obstruction of respiratory tract, and exposure to animate mechanical forces.	V01-X59
Sudden Infant Death Syndrome (SIDS)	SIDS is the sudden death of an infant under the age of one that cannot be explained even after a full investigation and autopsy.	R95
Assault (homicide)	This category includes types of assaults that result in a homicide.	X85-Y09
Undetermined	This category includes deaths that were categorized as “undetermined injury” deaths. The manner of death could not be determined.	Y20-Y34

Cause of Death	Explanation	ICD-10 Codes
Other	This category includes all other causes not listed in the five categories above. Other causes include ill-defined and unknown causes of mortality, malignant neoplasm, hepatic failure, meningitis, influenza and pneumonia, viral infection, diarrhea and gastroenteritis of infectious origin, encephalopathy, disease of the circulatory system, anoxic brain damage, pulmonary collapse, other hypoglycemia, glycogen storage disease, volume depletion, disorders of fluid, electrolyte and acid-base balance, gastritis, duodenitis, and noninfective enteritis and colitis, and septicemia.	All other codes not used in categories above

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