Introduction

Quotes from 2018 SD PRAMS mothers:

“Thank you for worrying about others. Regarding my pregnancy, I feel that everything went well, I didn’t have any complications, and although it wasn’t planned, I was very happy when I found out.”

“I was excited to see such research being conducted. I think there is a lot of awareness about alcohol/drugs while pregnant, but minimal on other factors, such as healthy diet and exercise. I’d love to see more information shared and available about ways to encourage a healthy pregnancy.”

The health status of South Dakotans is commonly reported from public health surveillance surveys. Surveys such as the Behavioral Risk Factor Surveillance System (BRFSS) and the Youth Risk Behavior Surveillance System (YRBSS) provide information that is used by policy makers, public health professionals, advocacy groups, health care organizations, and others to develop initiatives to improve the health of the population. South Dakota has one of the highest infant mortality rates in the U.S. yet there are little data available on factors that influence health behaviors and attitudes of mothers that can ultimately influence birth outcomes. The Pregnancy Risk Assessment Monitoring System (PRAMS) survey is a Centers for Disease Control and Prevention (CDC) recommended surveillance tool that is used to provide this type of information.

The CDC established the PRAMS in 1987 to obtain information about maternal behavior and experiences that may be associated with adverse birth outcomes. The survey is disseminated to women who have recently given birth to live-born infants. In 2018, 47 states (including South Dakota), New York City, Puerto Rico, and the District of Columbia participated in PRAMS.

A random sample of South Dakota residents who delivered a live-born infant in 2018 was selected from birth certificate files to complete the survey through mail or by telephone. American Indian and other race infants were oversampled to ensure sufficient numbers to obtain reliable estimates. Data were collected on a variety of topics that included: intendedness of pregnancy, access to prenatal care, health insurance, infant sleeping positions, medical problems during pregnancy, delivery of the infant, and health-related behaviors of the mother (e.g., smoking and alcohol use). The majority of the questions came from the CDC PRAMS core and standardized questions. In addition, questions about illicit drug use and adverse childhood experiences (ACEs) were added due to the increasing prevalence of drug use and the recognition of the role of stress in early life on adult behaviors and health.

The 2018 PRAMS survey provides information for South Dakota to assess overall pregnancy experiences and maternal health behaviors, and data may be used to develop, modify, or evaluate programs for new mothers and their children. Furthermore, the PRAMS survey will provide useful data to assess future trends in problematic areas. The current report includes data from the 2017 and 2018 PRAMS surveys for trend analysis.

In each chapter a table of statewide prevalence rates of various characteristics is provided, along with trends over time and prevalence rates by demographic characteristics (race, ethnicity, age, education, marital status, annual income and region of the state). It also was determined whether the various characteristics were associated with risk factors, or specific attitudes, behaviors, or outcomes (unintended pregnancy, no insurance before pregnancy, smoking or drinking before pregnancy, illicit drug use before pregnancy, maternal obesity, delay or no prenatal care, attending less than 80% of prenatal visits, teeth not cleaned during pregnancy, emotional abuse during pregnancy, medical conditions [diabetes, hypertension, depression] diagnosed during pregnancy, caesarean section, low or high birthweight, preterm birth, NICU admission, never breastfeeding, not sleeping alone in room with the mother, the infant being exposed to smoke, and ACE score of 4 or greater). The associations between
the outcomes and demographic characteristics and risk factors are summarized in the Appendix. The statistical significance of these associations that are presented does not account for relationships with other characteristics. Such interconnected relationships better describe the roles of potential risk factors, but the necessary evaluations are complex. The diagram below shows the associations among four of the seven demographic characteristics that are described. Ethnicity, marital status and insurance status also were associated with these four characteristics as well as each other.

In order to determine which demographic characteristics or risk factors are independently associated with a specific outcome, a more complex statistical approach needs to be taken, which is beyond the scope of this report. However, it is important to consider these interrelationships when interpreting associations between the behaviors and attitudes that are presented and the demographic characteristics and risk factors. For example, there are racial disparities in factors known to be associated with smoking (young maternal age, lack of education, poverty) and race differences that may be observed in smoking rates may be explained by racial disparities in these other factors. In fact, that is what we found with the South Dakota 2014 PRAMS-like survey (1). Once the influence of maternal age, lack of education, and poverty were controlled for statistically, race differences in cigarette smoking were no longer apparent.

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Map: Defining regions within the state

Map of health regions of South Dakota:

In addition to describing the prevalence of various behaviors and attitudes by demographic characteristics (maternal race, ethnicity, age, education, marital status, household income), the prevalence is also given by region of the state that the mother resides. The map above defines the counties that are included in each region.
Executive Summary

The 2018 PRAMS survey gave South Dakota women an opportunity to share their experiences as part of an effort to improve the health of mothers, babies, and families in South Dakota. The data presented are meant to be used in efforts to reduce infant mortality and improve maternal health by describing needs, focusing interventions, influencing clinical practice, and shaping policy and budget development. Below is a summary of prevalence rates associated with various behaviors and health factors. Demographic characteristics and risk factors/outcomes associated with some of these behaviors and health factors are summarized in the Data Tables section of this report.

Preconception care

- 69% of mothers visited a health care worker the 12 months before pregnancy.
- 16% of mothers visited a health care worker the 12 months before pregnancy and talked with a health care worker about improving their health before pregnancy. The rate is below the Healthy People 2020 target of 27%.

Preconception health

- 44% of mothers exercised three or more days/week for fitness the 12 months before pregnancy.
- Prevalence of other health-related activities done the 12 months before pregnancy included talking to a health care worker about family medical history (31%), dieting to lose weight (28%), regularly taking prescription medicines other than birth control (22%) and being checked for diabetes (14%).
- Among women with a previous birth, 14% had their current infant within 18 months of the previous child.

Pregnancy intention & birth control use

- 44% of mothers had an intended pregnancy, this is below the Healthy People 2020 target of 56%.
- Among women who were not trying to get pregnant, 66% were not using birth control at conception.

Nutrition & weight

- 39% of mothers were taking a vitamin daily the month before pregnancy, which is above the Healthy People 2020 target of 33%.
- Among women not taking vitamins daily, the top two reasons for not taking vitamins daily were that the mother was not planning on becoming pregnant (54%) and she did not think she needed vitamins (36%).
- 47% of mothers had a healthy body mass index before pregnancy.
- 50% of South Dakota mothers were overweight or obese.

Medical risk factors (depression and gestational diabetes)

- 16% of mothers reported having depression the three months before pregnancy.
- 17% of mothers reported having depression during pregnancy.
- 10% of mothers had gestational diabetes.

Prenatal care: entry, adequacy and barriers

- 83% of mothers began prenatal care in the first trimester, the Healthy People 2020 target is 78%.
- 82% of mothers attended 80% or more of their prenatal care visits, a slight decrease from the 2017 rate of 86%. The Healthy People 2020 target is 78%.
- 74% of mothers received adequate or greater than adequate prenatal care based on the Kotelchuck Index.
- 88% of mothers started prenatal care as early as they wanted.
- 94% self-reported going to all their recommended prenatal visits.
- The top two reasons mothers reported for not getting prenatal care as early as they wanted included that they did not know they were pregnant (44%) and they could not get an appointment when they wanted (36%).
Top two barriers to not going to all the recommended visits included having too many other things going on (42%) and not having transportation to get to the clinic or office (31%).

**Flu vaccinations**

- 75% of mothers received a flu vaccine the 12 months before the delivery of the infant (13% before pregnancy and 62% during pregnancy). The Healthy People 2020 recommendation is 80%.

**Oral health**

- 49% of mothers had their teeth cleaned during their most recent pregnancy. The Healthy People 2020 recommendation is 49%.
- The top two barriers to dental care were not being able to afford to go (20%) and not thinking it was safe to go to the dentist during pregnancy (11%).

**Abuse**

- Less than 3% of mothers reported being physically abused before and during pregnancy by their partner or husband.
- Less than 2% of mothers reported being sexually abused during pregnancy by their partner or husband.
- 7% of mothers were emotionally abused during pregnancy.

**Tobacco, quit status and infant environmental smoke exposure**

- 25% of mothers smoked the three months before pregnancy. The Healthy People 2020 target is 12%.
- 10.4% of mothers smoked the last three months of pregnancy, the Healthy People 2020 target is 1%.
- 6.2% of mothers used e-cigarettes or other electronic nicotine products in the two years before pregnancy.
- Among mothers who smoked the three months before pregnancy, 63% quit smoking before or during pregnancy and 76% were advised by their health care provider to quit smoking.
- The top two barriers to quitting included cravings for a cigarette (66%) and the loss of a way to handle stress (58%).
- Among mothers who smoked prior to pregnancy and quit during pregnancy, the relapse rate (restarted smoking at the time the survey was completed) was 46%. The Healthy People 2020 target is 38%.
- 97% of mothers stated that their infant was not in an enclosed space with someone who smoked in the previous week.

**Alcohol & Drug Use**

- 67% of mothers drank in the three months before pregnancy, a slight increase from the 2017 rate of 63%. The Healthy People 2020 target is 44%.
- Among women who drank in the three months before pregnancy, 38% drank four alcoholic drinks or more in a 2-hour time span (binge drinking) at least one time.
- 8.2% of mothers drank the last three months of pregnancy. The Healthy People 2020 target is 2%.
- 8.6% of mothers used an illicit drug before pregnancy.
- 5.1% of mothers used an illicit drug during pregnancy, a slight increase from the 2017 rate of 3.3%.

**Breastfeeding**

- 92% of mothers ever breastfed. The Healthy People 2020 target is 82%.
- 76% of mothers breastfed at least two months.
- Mothers reported that the top two sources of helpful information about breastfeeding included the mother’s doctor (84%) and a nurse, midwife, or doula (77%).
- The top two reasons for stopping breastfeeding included the mother thinking she was not producing enough milk (53%) and that breast milk alone did not satisfy the baby (33%).

**Infant health**

- 7.5% of all mothers had a preterm birth, which is less than the Healthy People 2020 target of 9.9%.
- 6.1% of mothers had a singleton infant that was born preterm.
• 3.4% of mothers had a singleton infant with a low birth weight infant (< 2,500 grams).
• 67% of infants stayed in the hospital two days or less following birth.

Infant safe sleep
• 87% of mothers placed their infant on his or her back to sleep. The Healthy People 2020 target is 76%.
• 41% of mothers placed their infants on an approved sleep surface.
• 46% of mothers most often laid their infant to sleep without soft objects or loose bedding.
• 43% of mothers’ infants room-shared without bed-sharing.

Postpartum health and birth control use
• 89% of mothers attended a postpartum visit, less than the Healthy People 2020 target of 91%.
• 13% of mothers had indications of postpartum depression.
• Among women who were not pregnant or trying to get pregnancy at the time of the survey, 21% were not using birth control, 22% were using the least effective contraceptives, 25% were using moderately effective contraceptives, and 33% were using the most effective contraceptives.
• The top two reasons for not using birth control as reported by the mother was not wanting to use birth control (45%) and being worried about side effects from birth control (26%).

Adverse Childhood Experiences (ACEs)
• 22% of mothers had a high ACE score (4+).

Health insurance
• 13% of mothers were uninsured before pregnancy.
• 2.5% of mothers were uninsured during pregnancy and 12% of mothers had no insurance after the delivery.

Household income and poverty
• 29% of mothers had household incomes at or below 100% of the Federal Poverty Level (FPL).
Acknowledgments

The South Dakota PRAMS project was carried out in 2018-2019. The following acknowledgments recognize the organizations and individuals that made this project successful.

Organizations

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- Women, Infants and Children (WIC) Offices throughout the state.
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Data Tables
Chapter 1: Preconception care

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preconception care</strong></td>
<td></td>
</tr>
<tr>
<td>Visited a health care worker the 12 months before pregnancy</td>
<td>69.2 (66.0-72.4, 7583)</td>
</tr>
<tr>
<td>Visited a health care worker the 12 months before pregnancy and talked about preparing for a healthy pregnancy</td>
<td>16.2 (13.8-19.1, 1756)</td>
</tr>
<tr>
<td><strong>Among those women who visited a health care worker the 12 months before pregnancy, the visit was a:</strong></td>
<td></td>
</tr>
<tr>
<td>Visit to have teeth cleaned by a dentist or dental hygienist</td>
<td>65.2 (61.1-69.3, 5074)</td>
</tr>
<tr>
<td>Regular checkup at OB/GYN office</td>
<td>48.7 (44.4-53.1, 3790)</td>
</tr>
<tr>
<td>Regular checkup at family doctor’s office</td>
<td>39.1 (34.9-43.3, 3040)</td>
</tr>
<tr>
<td>Visit for an illness or chronic condition</td>
<td>19.8 (16.3-23.2, 1541)</td>
</tr>
<tr>
<td>Visit for family planning or birth control</td>
<td>15.8 (12.6-19.0, 1234)</td>
</tr>
<tr>
<td>Visit for depression or anxiety</td>
<td>12.4 (9.6-15.1, 964)</td>
</tr>
<tr>
<td>Visit for an injury</td>
<td>7.8 (5.5-10.1, 610)</td>
</tr>
<tr>
<td><strong>Among those women who visited a health care worker the 12 months before pregnancy, the healthcare provider: preconception care topics included:</strong></td>
<td></td>
</tr>
<tr>
<td>Asked if mother was smoking</td>
<td>81.6 (78.1-85.0, 6066)</td>
</tr>
<tr>
<td>Asked if mother was feeling down or depressed</td>
<td>67.9 (63.8-72.1, 5082)</td>
</tr>
<tr>
<td>Asked if mother was being emotionally or physically abused</td>
<td>67.6 (63.5-71.8, 5078)</td>
</tr>
<tr>
<td>Asked the mother about the kind of work she did</td>
<td>66.4 (62.2-70.5, 5003)</td>
</tr>
<tr>
<td>Talked about mother’s desire to have/not have more children</td>
<td>41.1 (36.7-45.5, 3079)</td>
</tr>
<tr>
<td>Told the mother to take a vitamin with folic acid</td>
<td>38.3 (34.0-42.7, 2874)</td>
</tr>
<tr>
<td>Talked about using birth control to prevent pregnancy</td>
<td>35.7 (31.5-39.9, 2665)</td>
</tr>
<tr>
<td>Talked about maintaining healthy weight</td>
<td>33.7 (29.5-37.8, 2504)</td>
</tr>
<tr>
<td>Talked about how to improve health before pregnancy</td>
<td>23.6 (19.9-27.3, 1756)</td>
</tr>
<tr>
<td>Tested the mother for HIV</td>
<td>22.9 (19.2-26.5, 1696)</td>
</tr>
<tr>
<td>Talked about STDs such as chlamydia, gonorrhea, syphilis</td>
<td>20.9 (17.3-24.4, 1551)</td>
</tr>
<tr>
<td>Talked about controlling medical conditions such as diabetes, high blood pressure</td>
<td>9.9 (7.4-12.3, 737)</td>
</tr>
</tbody>
</table>

**Significance**

Preconception health and care is an important component of Healthy People 2020. Preconception care focuses on management of behavioral risk factors and chronic diseases that can lead to increased risk of adverse birth outcomes such as still births, birth defects, low birthweight, preterm birth, infant death, and sudden infant death syndrome (SIDS) (1,2).

**PRAMS asked women:**

Q10 In the 12 months before you got pregnant with your new baby, did you have any health care visits with a doctor, nurse, or other health care worker, including a dental or mental health worker?

Q11 What type of health care visit did you have in the 12 months before you got pregnant with your new baby? [List]

Q12 During any of your health care visits in the 12 months before you got pregnant, did a doctor, nurse, or other health care worker do any of the following things? [List]

**Healthy People 2020 Objectives**

- **MICH-16** Increase the proportion of women delivering a live birth who received preconception care services and practiced key recommended preconception health behaviors.
- **MICH-16.1** Increase the proportion of women delivering a live birth who discussed preconception health with a health care worker prior to pregnancy to 27%.
Visited a Health Care Worker the 12 Months Before Pregnancy

Prevalence and Trends (Figure 1.1)
The percentage of South Dakota mothers who visited a health care worker the 12 months before pregnancy has not changed (p-value for linear trend greater than 0.05).

Figure 1.1: Mothers who visited a health care worker the 12 months before pregnancy by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 1.2)
- Overall prevalence of South Dakota mothers who visited a health care worker the 12 months before pregnancy was 69.2%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with visiting a health care worker the 12 months before pregnancy included maternal race, ethnicity, age, education, marital status, household income, and region.
- Mothers who were white, non-Hispanic, older, had more years of education, married, and had a higher household income had higher prevalence of visiting a health care worker the 12 months before pregnancy compared with their counterparts. Mothers who resided in the Sioux Falls had the highest proportion of mothers who visited a health care worker the 12 months before pregnancy.

Risk Behaviors and Outcomes (Figure 1.3)
Mothers who visited a health care worker the 12 months before pregnancy, compared to mothers who did not visit a health care worker, were significantly (p-value less than 0.05) more likely to report that:
- They drank alcohol the 3 months before pregnancy (72.7% vs. 53.0%).
- Their infant does not sleep alone in the mother’s room (59.7% vs. 50.1%).

Mothers who visited a health care worker the 12 months before pregnancy, compared to mothers who did not visit a health care worker, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (8.9% vs. 21.4%).
- They smoked the 3 months before pregnancy (20.3% vs. 34.7%).
- They used illicit drugs the 3 months before pregnancy (7.0% vs. 11.3%).
- They started prenatal care after the first trimester or had no prenatal care (12.4% vs. 27.4%).
- They attended less than 80% of their prenatal visits (13.8% vs. 26.7%).
- They did not have their teeth cleaned during pregnancy (39.2% vs. 78.2%).
- They never breastfed their infant (4.7% vs. 15.6%).
- Their baby is exposed to smoke (1.9% vs. 4.6%; interpret these percentages with caution).
Figure 1.2: Percentage of mothers who visited a health care worker the 12 months before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

- **: p-value < 0.01, based on Rao-Scott chi-square test
- ++: p-value < 0.01, based on logistic regression results for linear trend

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>** Race **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, Non-Hisp.</td>
<td>75.5</td>
<td></td>
</tr>
<tr>
<td>Amer. Indian</td>
<td>53.2</td>
<td></td>
</tr>
<tr>
<td>Other Races</td>
<td>53.1</td>
<td></td>
</tr>
<tr>
<td>** Ethnicity **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hisp.</td>
<td>53.8</td>
<td></td>
</tr>
<tr>
<td>Non-Hisp.</td>
<td>70.2</td>
<td></td>
</tr>
<tr>
<td>** Age ++</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 yrs</td>
<td>48.6</td>
<td></td>
</tr>
<tr>
<td>20-24 yrs</td>
<td>53.1</td>
<td></td>
</tr>
<tr>
<td>25-29 yrs</td>
<td>74.1</td>
<td></td>
</tr>
<tr>
<td>30-34 yrs</td>
<td>75.6</td>
<td></td>
</tr>
<tr>
<td>&gt;=35 yrs</td>
<td>71.4</td>
<td></td>
</tr>
<tr>
<td>** Education ++</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;12 yrs</td>
<td>52.2</td>
<td></td>
</tr>
<tr>
<td>12 yrs</td>
<td>51.6</td>
<td></td>
</tr>
<tr>
<td>&gt;12 yrs</td>
<td>78.9</td>
<td></td>
</tr>
<tr>
<td>** Marital Status **</td>
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<td></td>
</tr>
<tr>
<td>Not Married</td>
<td>51.8</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>78.7</td>
<td></td>
</tr>
<tr>
<td>** Annual Income ++</td>
<td></td>
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</tr>
<tr>
<td>&lt;$16K</td>
<td>43.0</td>
<td></td>
</tr>
<tr>
<td>$16,001-$28K</td>
<td>59.6</td>
<td></td>
</tr>
<tr>
<td>$28,001-$48K</td>
<td>66.4</td>
<td></td>
</tr>
<tr>
<td>$48,001-$73K</td>
<td>79.9</td>
<td></td>
</tr>
<tr>
<td>$73,001+</td>
<td>90.0</td>
<td></td>
</tr>
<tr>
<td>** Region **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sturgis</td>
<td>57.5</td>
<td></td>
</tr>
<tr>
<td>Pierre</td>
<td>59.1</td>
<td></td>
</tr>
<tr>
<td>Aberdeen</td>
<td>71.9</td>
<td></td>
</tr>
<tr>
<td>Watertown</td>
<td>73.3</td>
<td></td>
</tr>
<tr>
<td>Sioux Falls</td>
<td>76.5</td>
<td></td>
</tr>
<tr>
<td>Mitchell</td>
<td>61.5</td>
<td></td>
</tr>
<tr>
<td>Rapid City</td>
<td>64.2</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1.3: Significant risk behaviors and outcomes by mother visiting a health care worker the 12 months before pregnancy, South Dakota, 2018 (weighted)

<table>
<thead>
<tr>
<th>Risk Behavior</th>
<th>Visited Health Care Worker</th>
<th>Did not Visit Health Care Worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Insured Before Preg.**</td>
<td>8.9</td>
<td>21.4</td>
</tr>
<tr>
<td>Smoke 3-Mo. Before Preg.**</td>
<td>20.3</td>
<td>34.7</td>
</tr>
<tr>
<td>Alcohol 3-Mo. Before Preg.**</td>
<td>7.0</td>
<td>11.3</td>
</tr>
<tr>
<td>Illicit Drugs 3-Mo. Before Preg.*</td>
<td>12.4</td>
<td>27.4</td>
</tr>
<tr>
<td>Attended &lt;80% of PNC Visits **</td>
<td>13.8</td>
<td>26.7</td>
</tr>
<tr>
<td>Teeth Not Cleaned During Preg.**</td>
<td>39.2</td>
<td>78.2</td>
</tr>
<tr>
<td>Never Breast-Fed **</td>
<td>4.7</td>
<td>15.6</td>
</tr>
<tr>
<td>Does Not Sleep Alone in Room w/Mother*</td>
<td>4.7</td>
<td>15.6</td>
</tr>
<tr>
<td>Baby Exposed to Smoke**^</td>
<td>1.9</td>
<td>4.6</td>
</tr>
</tbody>
</table>

* p-value < 0.05   ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care

Visited Health Care Provider 12 Months Before Pregnancy About Improving Health Before Pregnancy Prevalence and Trends (Figure 1.4)
The percentage of South Dakota mothers who visited a health care worker the 12 months before pregnancy and who talked with health care worker about improving their health before pregnancy has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 27% has not been achieved in any year.
Figure 1.4: Mothers who visited a health care worker the 12 months before pregnancy and who talked with health care worker about improving their health before pregnancy by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 1.5)
- Overall prevalence of South Dakota mothers who visited a health care worker the 12 months before pregnancy and who talked with health care worker about improving their health before pregnancy was 16.2%.
- Demographic characteristic that were significantly (p-value less than 0.05) associated with talking with a health care worker about improving health before pregnancy included education, marital status, and household income.
- Mothers who had more years of education, were married, and had a higher household income had higher prevalence of visiting a health care worker the 12 months before pregnancy and talking with them about improving their health before pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 1.6)
Mothers who visited a health care provider the 12 months before pregnancy about improving their health before pregnancy, compared to mothers who did not visit with a provider or talk about improving their health before pregnancy, were significantly (p-value less than 0.05) more likely to report that:
- Their infant was low birth weight (<2500 grams) (9.9% vs. 4.0%).

Mothers who visited a health care provider the 12 months before pregnancy about improving their health before pregnancy, compared to mothers who did not visit with a provider or talk about improving their health before pregnancy, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (7.2% vs. 14.2%; interpret these percentages with caution).
- They smoked the 3 months before pregnancy (13.9% vs. 27.2%).
- They used illicit drugs the 3 months before pregnancy (3.2% vs. 9.7%; interpret these percentages with caution).
- They started prenatal care after the first trimester or had no prenatal care (9.3% vs. 17.9%).
- They did not have their teeth cleaned during pregnancy (34.4% vs. 54.8%).
- They suffered emotional abuse during pregnancy (3.3% vs. 8.0%).
- They never breastfed their infant (3.2% vs. 9.3%; interpret these percentages with caution).
Figure 1.5: Percentage of mothers who visited a health care worker the 12 months before pregnancy and talked with health care worker about improving health before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

* p-value < 0.05, ** p-value < 0.01 based on Rao-Scott chi-square.
+ p-value < 0.05, ++ p-value <0.01 based on logistic regression results for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

---

**Healthy People 2020 (27%)**
Figure 1.6: Significant risk behaviors and outcomes by mother visiting a health care worker about improving her health before pregnancy, South Dakota, 2018 (weighted)

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Visited</th>
<th>Did not visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Insured Before Preg.**^</td>
<td>7.2%</td>
<td>14.2%</td>
</tr>
<tr>
<td>Smoke 3-Mo. Before Preg.**</td>
<td>3.2%</td>
<td>9.7%</td>
</tr>
<tr>
<td>Illicit Drugs 3-Mo. Before Preg.**^</td>
<td>3.2%</td>
<td>9.7%</td>
</tr>
<tr>
<td>Delayed or No PNC*</td>
<td>9.3%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Teeth Not Cleaned During Preg.**</td>
<td>3.3%</td>
<td>8.0%</td>
</tr>
<tr>
<td>Emotional Abuse During Preg.**</td>
<td>4.0%</td>
<td>9.9%</td>
</tr>
<tr>
<td>Low Birth Weight (&lt;2500)**</td>
<td>3.2%</td>
<td>9.3%</td>
</tr>
</tbody>
</table>

* p-value < 0.05   ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

References


## Chapter 2: Preconception health

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health-related activities done during the 12 months before pregnancy</td>
<td></td>
</tr>
<tr>
<td>Was exercising 3 or more days/week for fitness outside of regular job</td>
<td>43.8 (40.2-47.4, 4867)</td>
</tr>
<tr>
<td>Talked to a health care worker about family medical history</td>
<td>31.4 (28.2-34.7, 3470)</td>
</tr>
<tr>
<td>Was dieting to lose weight</td>
<td>27.5 (24.3-30.7, 3050)</td>
</tr>
<tr>
<td>Was regularly taking prescription medicines other than birth control</td>
<td>22.0 (19.0-24.9, 2439)</td>
</tr>
<tr>
<td>Was checked for diabetes</td>
<td>14.2 (12.1-16.3, 1562)</td>
</tr>
</tbody>
</table>

### Among women who had a previous birth, age difference between last child and most recent baby

<table>
<thead>
<tr>
<th>Age Difference</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 12 months</td>
<td>3.7 (2.0-5.4, 279)</td>
</tr>
<tr>
<td>13 to 18 months</td>
<td>9.8 (7.3-12.4, 735)</td>
</tr>
<tr>
<td>19 to 24 months</td>
<td>16.3 (13.1-19.5, 1218)</td>
</tr>
<tr>
<td>2 to 3 years</td>
<td>24.6 (20.8-28.4, 1841)</td>
</tr>
<tr>
<td>3 to 5 years</td>
<td>26.5 (22.8-30.2, 1983)</td>
</tr>
<tr>
<td>More than 5 years</td>
<td>19.0 (15.6-22.5, 1424)</td>
</tr>
</tbody>
</table>

### Significance

Preconception health is important for healthy birth outcomes. A national action plan for promoting preconception health notes the importance of participation in recommended levels of physical activity, having a routine checkup during the 12 months before pregnancy, being a healthy weight and being screened for diabetes (1). Interpregnancy intervals shorter than 18 months are associated with adverse pregnancy outcomes, especially among women aged 35 years and older (2).

### PRAMS asked women:

**Q5** What is the age difference between your new baby and the child you delivered just before your new one?

**Q6** At any time during the 12 months before you got pregnant with your new baby, did you do any of the following things? [List]

### Healthy People 2020 Objective

- **MICH-16** Increase the proportion of women delivering a live birth who received preconception care services and practiced key recommended preconception health behaviors.

### Exercised 3 or More Days/Week for Fitness the 12 Months Before Pregnancy

**Prevalence and Trends (Figure 2.1)**

The percentage of South Dakota mothers who were exercising 3 or more days/week for fitness the 12 months before pregnancy has not changed ((p-value for linear trend greater than 0.05)).
Demographic Characteristics (Figure 2.2)
- Overall prevalence of South Dakota mothers who were exercising 3 or more days/week for fitness the 12 months before pregnancy was 43.8%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with exercising 3 or more days/week for fitness the 12 months before pregnancy included maternal race, education, and household income.
- Mothers who were white, had more years of education, and had greater household incomes had a higher prevalence of exercising 3 or more days/week for fitness the 12 months before pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 2.3)
Mothers who exercised 3 or more days of the week, compared to mothers who did not exercise 3 or more days of the week, were significantly (p-value less than 0.05) less likely to report that:
- They smoked the 3 months before pregnancy (19.3% vs. 29.6%).
- They used illicit drugs the 3 months before pregnancy (5.3% vs. 11.3%).
- They did not have their teeth cleaned during pregnancy (44.6% vs. 56.9%).
Figure 2.2: Percentage of mothers who were exercising three or more days/week for fitness the 12 months before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

- **Statewide**: 43.8%
- **Race**
  - White, Non-Hisp.: 45.7%
  - Amer. Indian: 41.8%
  - Other Races: 34.7%
- **Ethnicity**
  - Hisp.: 35.9%
  - Non-Hisp.: 44.2%
- **Age**
  - <20 yrs: 40.4%
  - 20-24 yrs: 37.2%
  - 25-29 yrs: 45.9%
  - 30-34 yrs: 43.2%
  - >=35 yrs: 51.6%
- **Education**
  - <12 yrs: 36.3%
  - 12 yrs: 37.2%
  - >12 yrs: 47.7%
- **Marital Status**
  - Not Married: 40.1%
  - Married: 45.8%
- **Annual Income**
  - <$16K: 35.9%
  - $16,001-$28K: 43.2%
  - $28,001-$48K: 41.2%
  - $48,001-$73K: 40.4%
  - $73,001+: 55.5%
- **Region**
  - Sturgis: 47.8%
  - Pierre: 42.0%
  - Aberdeen: 29.1%
  - Watertown: 38.5%
  - Sioux Falls: 47.9%
  - Mitchell: 41.2%
  - Rapid City: 46.8%

* p-value < 0.05, based on Rao-Scott chi-square test.
++ p-value < 0.01, based on logistic regression results for linear trend.
Figure 2.3: Risk behaviors and outcomes by mothers who exercised three or more days per week the 12 months before pregnancy, South Dakota, 2018 (weighted)

** p-value < 0.01
p-value based on Rao-Scott chi-square test.

References


Chapter 3: Pregnancy intentions and birth control use prior to pregnancy

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
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<tbody>
<tr>
<td>Maternal intention and timing of pregnancy</td>
<td></td>
</tr>
<tr>
<td>Later \textit{(mistimed)}</td>
<td>18.0 (15.1-20.9, 1965)</td>
</tr>
<tr>
<td>Sooner \textit{(mistimed)}</td>
<td>16.7 (14.1-19.4, 1829)</td>
</tr>
<tr>
<td>Then \textit{(intended)}</td>
<td>44.2 (40.6-47.8, 4834)</td>
</tr>
<tr>
<td>Did not want then or in the future \textit{(unintended)}</td>
<td>5.3 (3.7-6.8, 574)</td>
</tr>
<tr>
<td>Was not sure \textit{(unsure)}</td>
<td>15.8 (13.2-18.4, 1725)</td>
</tr>
<tr>
<td>Women who were trying to get pregnant at conception</td>
<td></td>
</tr>
<tr>
<td>Among women who were not trying to get pregnant, those who were not using birth control at conception</td>
<td>56.2 (52.7-59.8, 6169)</td>
</tr>
</tbody>
</table>

Significance

Data on the intendedness of pregnancy is sparse. Researchers at the Guttmacher Institute released an article in 2019 stating that 4.5% of pregnancies in 2011 among women aged 15-44 years in the United States were unintended (1). While the actual definition of unintended pregnancy is debatable, the argument of the adverse public health implications of unintended pregnancies is not. The cost burden for publicly funded pregnancies was estimated to be $21.4 billion in 2010 (2). An estimate for South Dakota’s total public cost for the estimated 2,400 publicly funded unintended births was $49.4 million in 2010, with $35 million from federal funds and $14.4 million from state funds (2).

PRAMS asked women:

Q16 Thinking back to \textit{just before} you got pregnant with your new baby, how did you feel about becoming pregnant? [I wanted to be pregnant sooner, I wanted to be pregnant later, I wanted to be pregnant then, I didn’t want to be pregnant then or at any time in the future, I was not sure]

Q17 When you got pregnant with your new baby, were you trying to get pregnant?

Q18 When you got pregnant with your new baby, were you or your husband or partner doing anything to keep from getting pregnant?

Healthy People 2020 Objective

• FP-1 Increase the proportion of pregnancies that are intended to 56%.

Intended Pregnancy

Prevalence and Trends (Figure 3.1)

The percentage of South Dakota mothers who had an intended pregnancy has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 56% has not been achieved in any year.
Demographic Characteristics (Figure 3.2)
- Overall prevalence of South Dakota mothers who had an intended pregnancy was 44.2%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with having an intended pregnancy included maternal race, age, education, marital status, and household income.
- Mothers who were white, older, had more years of education, married, and had greater household income had a higher prevalence of having an intended pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 3.3)
Mothers who had an intended pregnancy, compared to mothers who did not have an intended pregnancy, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (8.9% vs. 16.2%).
- They smoked the 3 months before pregnancy (16.8% vs. 31.3%).
- They used illicit drugs the 3 months before pregnancy (5.2% vs. 11.6%).
- They started prenatal care after the first trimester or had no prenatal care (12.4% vs. 20.3%).
- They attended less than 80% of their prenatal visits (13.2% vs. 21.1%).
- They did not have their teeth cleaned during pregnancy (46.6% vs. 54.9%).
- They suffered emotional abuse during pregnancy (3.7% vs. 9.8%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (25.5% vs. 36.1%).
- They had a high ACE score (4+) (16.6% vs. 26.8%).
Figure 3.2: Percentage of South Dakota mothers who had an intended pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
+ p-value < 0.05, ++ p-value <0.01 based on logistic regression results for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher). — Healthy People 2020 (56%)
Figure 3.3: Risk behaviors and outcomes by mothers with an intended pregnancy, South Dakota, 2018 (weighted)

- Not Insured Before Preg.**
  - Intended pregnancy: 8.9%
  - Not an intended pregnancy: 16.2%
- Smoke 3-Mo. Before Preg.**
  - Intended pregnancy: 16.8%
  - Not an intended pregnancy: 31.3%
- Illicit Drugs 3-Mo. Before Preg.**
  - Intended pregnancy: 5.2%
  - Not an intended pregnancy: 11.6%
- Delayed or No PNC **
  - Intended pregnancy: 12.4%
  - Not an intended pregnancy: 20.3%
- Attended <80% of PNC Visits **
  - Intended pregnancy: 13.2%
  - Not an intended pregnancy: 21.1%
- Teeth Not Cleaned During Preg.*
  - Intended pregnancy: 46.6%
  - Not an intended pregnancy: 54.9%
- Emotional Abuse During Pregnancy**
  - Intended pregnancy: 3.7%
  - Not an intended pregnancy: 9.8%
- Diabetes, Hypertension, or Depression During Preg.**
  - Intended pregnancy: 25.5%
  - Not an intended pregnancy: 36.1%
- ACE Score 4+ **
  - Intended pregnancy: 16.6%
  - Not an intended pregnancy: 26.8%

* p-value < 0.05  ** p-value < 0.01  p-value based on Rao-Scott chi-square test.  
PNC = prenatal care; ACE = adverse childhood experiences

References
2. Sonfield A and Kost K, Public Costs from Unintended Pregnancies and the Role of Public Insurance Programs in Paying for Pregnancy-Related Care: National and State Estimates for 2010, New York: Guttmacher Institute, 2015,  
Chapter 4: Nutrition and maternal weight (body mass index)

<table>
<thead>
<tr>
<th>Measure</th>
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<td>Vitamin use the <em>month before</em> pregnancy</td>
<td></td>
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<tr>
<td>No vitamin use</td>
<td>45.0 (41.5-48.6, 4956)</td>
</tr>
<tr>
<td>1 to 3 times per week</td>
<td>8.1 (6.0-10.1, 886)</td>
</tr>
<tr>
<td>4 to 6 times per week</td>
<td>7.9 (5.9-9.8, 865)</td>
</tr>
<tr>
<td>Daily use</td>
<td>39.0 (35.5-42.5, 4294)</td>
</tr>
</tbody>
</table>

*Among women who did not take daily vitamins, reasons include*

- Not planning to get pregnant: 54.3 (49.1-59.5, 2796)
- Did not think they needed vitamins: 36.4 (31.4-41.3, 1874)
- Did not want to take vitamins: 16.2 (12.3-20.1, 832)
- Vitamins were too expensive: 5.2 (2.7-7.6, 266)
- Vitamins gave side effects: 7.1 (4.5-9.8, 368)
- Was not told to take a vitamin: 15.1 (11.5-18.7, 778)

**Pre-pregnancy Body Mass Index (BMI) – National Heart, Blood and Lung**

*Institute definition**

- Underweight (<18.5): 2.9 (1.8-4.1, 326)
- Healthy weight (18.5 to less than 25): 46.9 (43.3-50.5, 5205)
- Overweight (25.0 to less than 30): 27.1 (23.9-30.3, 3006)
- Obese (30 or over): 23.1 (20.1-26.0, 2562)

** Body mass index calculated from pre-pregnancy height and weight based on birth certificate data. NHBLI uses BMI-for-age percentiles to define weight category for girls under age 20.

**Significance**

A low intake of micronutrients and of vitamins like folate may increase the risk of adverse pregnancy outcomes including preterm birth and low birthweight births (1). Additionally, a high body mass index (BMI) prepregnancy and excessive weight gain during pregnancy are associated with adverse pregnancy outcomes including increased risk of maternal hypertension and increased rates of cesarean section (2).

**PRAMS asked women:**

Q8 During the *month before* you got pregnant with your new baby, how many times a week did you take a multivitamin, a prenatal vitamin or a folic acid vitamin? [List]

Q9 During the *month before* you got pregnant with your new baby, what were your reasons for not taking multivitamins, prenatal vitamins, or folic acid vitamins? [List]

**Healthy People 2020 Objectives**

- **MICH-16.2** Increase the proportion of women delivering a live birth who took multivitamins/folic acid prior to pregnancy to 33%.
- **MICH-16.5** Increase the proportion of women delivering a live birth who had a healthy weight (BMI of 18.5-24.9) prior to pregnancy to 58%.

**Definitions**

*Folic acid* is a B vitamin present in leafy green vegetables, legumes, citrus, whole grains, poultry, pork, shellfish, and liver. Taken before and during pregnancy, folic acid can prevent the neural tube defects spina bifida and anencephaly (3).

*Body Mass Index (BMI)* is a measure of the relationship between weight and height (BMI = weight [kg] / height [m]^2) that is associated with body fat and health risk.
Taking a Vitamin Daily the Month Before Pregnancy

Prevalence and Trends (Figure 4.1)
The percentage of South Dakota mothers who took a vitamin daily the month before has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 33% has been achieved for all years.

Figure 4.1: Mothers who took a daily vitamin the month before pregnancy by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 4.2)
- Overall prevalence of South Dakota mothers who were taking a vitamin daily the month before pregnancy was 39.0%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with the percentage of mothers taking a vitamin daily the month before pregnancy included maternal race, ethnicity, age, education, marital status, and household income.
- Mothers who were white, non-Hispanic, older, had more years of education, married, and had greater household income had a higher prevalence of taking a vitamin daily the month before pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 4.3)
Mothers who took a vitamin daily, compared to mothers who did not take a vitamin daily, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (5.4% vs. 18.4%).
- They smoked the 3 months before pregnancy (10.2% vs. 35.1%).
- They used illicit drugs the 3 months before pregnancy (2.8% vs. 12.5%).
- They did not have their teeth cleaned during pregnancy (36.2% vs. 61.4%).
- They suffered emotional abuse during pregnancy (2.7% vs. 9.9%).
- They never breastfed their infant (3.4% vs. 11.5%).
- Their baby is exposed to smoke (1.4% vs. 3.5%; interpret these percentages with caution).
- They had a high ACE score (4+) (13.6% vs. 27.9%).
Figure 4.2: Percentage of mothers who were taking a daily vitamin the month before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value <0.01 based on logistic regression results for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

Healthy People 2020 (33%)

---
Figure 4.3: Risk behaviors and outcomes by mothers who took a daily vitamin the month before pregnancy, South Dakota, 2018 (weighted)

- **Not Insured Before Preg.**
  - Takes vitamins daily: 5.4%
  - Does not take vitamins daily: 18.4%
- **Smoke 3-Mo. Before Preg.**
  - Takes vitamins daily: 10.2%
  - Does not take vitamins daily: 35.1%
- **Illicit Drugs 3-Mo. Before Preg.**
  - Takes vitamins daily: 2.8%
  - Does not take vitamins daily: 12.5%
- **Teeth Not Cleaned During Preg.**
  - Takes vitamins daily: 36.2%
  - Does not take vitamins daily: 61.4%
- **Emotional Abuse During Pregnancy**
  - Takes vitamins daily: 2.7%
  - Does not take vitamins daily: 9.9%
- **Never Breast-Fed**
  - Takes vitamins daily: 3.4%
  - Does not take vitamins daily: 11.5%
- **Baby Exposed to Smoke**
  - Takes vitamins daily: 1.4%
  - Does not take vitamins daily: 3.5%
- **ACE Score 4+**
  - Takes vitamins daily: 13.6%
  - Does not take vitamins daily: 27.9%

**p-value < 0.01**
p-value based on Rao-Scott chi-square test.
Healthy BMI

Prevalence and Trends (Figure 4.4)
The percentage of South Dakota mothers who had a healthy BMI before pregnancy has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 58% has not been achieved in any year.

Figure 4.4: Mothers who had a healthy BMI before pregnancy by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 4.5)
- Overall prevalence of South Dakota mothers with a healthy BMI (18.5 - 24.9 kg/m²) before pregnancy was 46.9%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with the percentage of mothers who had a healthy BMI before pregnancy included maternal race, ethnicity, and age.
- Mothers who were white or of other races, non-Hispanic, and younger had a higher prevalence of being a healthy weight compared with their counterparts.

Risk Behaviors and Outcomes (Figure 4.6)
Mothers who had a healthy BMI, compared to mothers who did not have a healthy BMI, were significantly (p-value less than 0.05) less likely to report that:
- They had diabetes, hypertension, or depression diagnosed during pregnancy (24.4% vs. 37.7%).
- They had a cesarean section delivery (17.7% vs. 30.4%).
Figure 4.5: Percentage of mothers who had a healthy BMI before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

- ** Race
  - White, Non-Hisp.: 49.3%
  - Amer. Indian: 37.2%
  - Other Races: 45.9%

- ** Ethnicity
  - Hisp.: 35.5%
  - Non-Hisp.: 47.5%

- ** Age
  - <20 yrs: 41.9%
  - 20-24 yrs: 46.4%
  - 25-29 yrs: 49.5%
  - 30-34 yrs: 42.0%
  - >=35 yrs: 40.5%

- ** Education
  - <12 yrs: 42.4%
  - 12 yrs: 50.6%
  - >12 yrs: 46.4%

- ** Marital Status
  - Not Married: 42.9%
  - Married: 49.1%

- ** Annual Income
  - <$16K: 43.3%
  - $16,001-$28K: 48.6%
  - $28,001-$48K: 46.4%
  - $48,001-$73K: 41.9%
  - $73,001+: 51.8%

- ** Region
  - Sturgis: 47.4%
  - Pierre: 46.8%
  - Aberdeen: 36.4%
  - Watertown: 43.9%
  - Sioux Falls: 49.7%
  - Mitchell: 42.4%
  - Rapid City: 51.2%

** p-value < 0.01 based on Rao-Scott chi-square test.
+ p-value <0.05 based on logistic regression results for linear trend.

---

Healthy People 2020 (58%)
Figure 4.6: Risk behaviors and outcomes by mothers who had a healthy BMI before pregnancy, South Dakota, 2018 (weighted)

** p-value < 0.01
p-value based on Rao-Scott chi-square test.

References
Chapter 5: Medical risk factors

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
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<tbody>
<tr>
<td><strong>Medical risk factors three months before pregnancy</strong></td>
<td></td>
</tr>
<tr>
<td>Type 1 or type 2 diabetes</td>
<td>1.5 (0.6-2.3, 164)</td>
</tr>
<tr>
<td>High blood pressure/hypertension</td>
<td>2.7 (1.7-3.8, 303)</td>
</tr>
<tr>
<td>Depression</td>
<td>15.5 (12.9-18.2, 1738)</td>
</tr>
<tr>
<td><strong>Medical risk factors during pregnancy</strong></td>
<td></td>
</tr>
<tr>
<td>Gestational diabetes (diabetes that started during this pregnancy)</td>
<td>9.7 (7.7-11.6, 1077)</td>
</tr>
<tr>
<td>High blood pressure (that started during this pregnancy), pre-eclampsia</td>
<td>12.6 (10.1-15.1, 1396)</td>
</tr>
<tr>
<td>Depression</td>
<td>16.7 (13.9-19.5, 1850)</td>
</tr>
<tr>
<td><strong>Received weekly shots of progesterone to prevent preterm birth</strong></td>
<td>4.3 (2.9-5.6, 450)</td>
</tr>
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</table>

**Significance**

An infant’s health at birth can be greatly affected by the mother’s health during pregnancy. Health risks such as diabetes, hypertension, and depression pose threats to the health of the infant and mother. Although physical ailments are more obvious, mental health is also a factor to consider because of the potential adverse effects for the mother and infant.

Type 1 or type 2 diabetes, as well as gestational diabetes, can lead to health concerns for the mother and baby not only during pregnancy and delivery but also for a lifetime. Women with diabetes have an increased risk of high blood pressure and preterm labor. Possible complications for the baby at delivery include low blood sugar, respiratory distress and birth trauma due to increased birthweight. In addition, the long-term concern is that gestational diabetes increases the future risk of developing type 2 diabetes in both the mother and her infant (1).

Preeclampsia, a type of hypertension that affects pregnant mothers, is a major factor in maternal and fetal mortality. Mild preeclampsia is characterized by a blood pressure greater than 140/90 mmHg (2). Along with hypertension, preeclampsia can be diagnosed by excessive protein loss in the urine, liver and kidney dysfunction, and issues with the central nervous system such as headaches and vision problems. Preeclampsia is associated with intrauterine growth retardation (IUGR), placental abruption, and oligohydramnios (low amniotic fluid levels).

Mental health disorders such as depression, anxiety, or perceived stress can contribute to negative birth outcomes. About 23% of pregnant women in the US suffer from minor or major depression. Depression may affect the mother, developing fetus, birthing process and infant development (3). Depression can also lead to physiological complications such as intra-uterine growth restriction, low birth weight, and preterm birth (4), making it an important disorder to screen for in pregnant women.

**PRAMS asked women:**

Q7  During the 3 months before you got pregnant with your new baby, did you have any of the following health conditions... diabetes, high blood pressure or depression?

Q27 During your most recent pregnancy, did you have any of the following health conditions... gestational diabetes, high blood pressure or depression?

Q28 During your most recent pregnancy, did a doctor, nurse, or other health care worker give you a series of weekly shots of medicine called progesterone, Makena®, or 17P (17 alpha-hydroxyprogesterone) to try to keep your new baby from being born too early?
Gestational Diabetes  
Prevalence and Trends (Figure 5.1)  
The percentage of South Dakota mothers who had gestational diabetes has not changed (p-value for linear trend greater than 0.05).

Figure 5.1: Mothers who had gestational diabetes by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 5.2)  
- Overall prevalence of South Dakota mothers who had gestational diabetes was 9.7%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with gestational diabetes included maternal age and marital status.
- Mothers who were older and married had a higher prevalence of gestational diabetes compared with their counterparts.

Risk Behaviors and Outcomes (Figure 5.3)  
Mothers who reported having gestational diabetes, compared to mothers who did not report having gestational diabetes, were significantly (p-value less than 0.05) more likely to report that:
- They were obese prior to pregnancy (42.5% vs. 21.2%).
- They had a cesarean section delivery (47.3% vs. 22.2%).
- Their infant was admitted to the NICU (18.4% vs. 7.7%).
Figure 5.2: Percentage of mothers who reported gestational diabetes by demographic characteristics, South Dakota, 2018 (weighted)

* p-value < 0.05 based on Rao-Scott chi-square test.
+ -value < 0.05 based on logistic regression results for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
Figure 5.3: Risk behaviors and outcomes by mothers who reporting having gestational diabetes, South Dakota, 2018 (weighted)

- Maternal Obesity Before Preg.**: 21.2% (No gestational diabetes) vs. 42.5% (Gestational diabetes)
- C-Section Delivery**: 22.2% (No gestational diabetes) vs. 47.3% (Gestational diabetes)
- NICU Admission**: 7.7% (No gestational diabetes) vs. 18.4% (Gestational diabetes)

** p-value < 0.01
p-value based on Rao-Scott chi-square test.

Depression Before Pregnancy
Prevalence and Trends (Figure 5.4)
The percentage of South Dakota mothers with depression the three months before pregnancy has not changed (p-value for linear trend greater than 0.05).

Figure 5.4: Mothers with depression before pregnancy by year, South Dakota, 2017–2018 (weighted)
Demographic Characteristics (Figures 5.5)

- Overall prevalence of South Dakota mothers who reported having depression the three months before pregnancy was 15.5%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with depression the three months before pregnancy included maternal race, age, education, marital status, and household income.
- Mothers who were American Indian, less than 20 years of age, had less years of education, were not married, and resided in households with less income had a greater prevalence of depression the three months before pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 5.6)

Mothers who had depression three months before pregnancy, compared to mothers who did not have depression three months before pregnancy, were significantly (p-value less than 0.05) more likely to report that:

- They smoked the 3 months before pregnancy (48.2% vs. 20.6%).
- They used illicit drugs the 3 months before pregnancy (20.5% vs. 6.5%).
- They were obese prior to pregnancy (31.9% vs. 21.5%).
- They did not have their teeth cleaned during pregnancy (63.9% vs. 48.9%).
- They suffered emotional abuse during pregnancy (18.9% vs. 4.7%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (78.5% vs. 22.9%).
- They had a cesarean section delivery (33.1% vs. 23.0%).
- Their infant was admitted to the NICU (18.4% vs. 6.8%).
- They had a high ACE score (4+) (53.3% vs. 16.7%).
Figure 5.5: Percentage of mothers who reported depression the three months before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

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<th>**</th>
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<th>+</th>
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<td>White, Non-Hisp.</td>
<td>14.4</td>
<td>24.1</td>
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<td>Amer. Indian</td>
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<td>Other Races</td>
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<td>20-24 yrs</td>
<td>24.2</td>
<td></td>
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<td>25-29 yrs</td>
<td>13.8</td>
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<td>30-34 yrs</td>
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<td>&gt;=35 yrs</td>
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<td>&lt;12 yrs</td>
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<td>$16,001-$28K</td>
<td>17.9</td>
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<td></td>
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<td>$28,001-$48K</td>
<td>15.4</td>
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<td></td>
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<tr>
<td>$48,001-$73K</td>
<td>12.3</td>
<td></td>
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<tr>
<td>$73,001+</td>
<td>10.6</td>
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<tr>
<td>Sturgis^</td>
<td>7.0</td>
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<td>Pierre</td>
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<td>Rapid City</td>
<td>19.9</td>
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** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01; + p-value < 0.05 based on logistic regression results for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
Figure 5.6: Risk behaviors and outcomes by mothers who had depression the three months before pregnancy, South Dakota, 2018 (weighted)

- No depression before pregnancy
- Depression three months before pregnancy

* p-value < 0.05      ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
ACE = adverse childhood experiences
Depression During Pregnancy
Prevalence and Trends (Figure 5.7)
The percentage of South Dakota mothers with depression during pregnancy has not changed (p-value for linear trend greater than 0.05).

Figure 5.7: Mothers with depression during pregnancy by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figures 5.8)
- Overall prevalence of South Dakota mothers who reported having depression during pregnancy was 16.7%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with depression during pregnancy included maternal race, age, education, marital status, and household income.
- Mothers who were American Indian, less than 25 years of age, had less years of education, were not married, and resided in households with less income had a greater prevalence of depression before pregnancy compared with their counterparts.

Risk Behaviors and Outcomes – Depression During Pregnancy (Figure 5.9)
Mothers who had depression during pregnancy, compared to mothers who did not have depression during pregnancy, were significantly (p-value less than 0.05) more likely to report that:
- They smoked the 3 months before pregnancy (46.0% vs. 20.8%).
- They used illicit drugs the 3 months before pregnancy (16.7% vs. 6.9%).
- They suffered emotional abuse during pregnancy (15.4% vs. 5.3%).
- They had a cesarean section delivery (32.3% vs. 23.1%).
- Their infant was admitted to the NICU (16.3% vs. 7.3%).
- They had a high ACE score (4+) (50.0% vs. 16.9%).
Figure 5.8: Percentage of mothers who reported depression during pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01, + p-value < 0.05 based on logistic regression to test for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
Figure 5.9: Risk behaviors and outcomes by mothers who had depression during pregnancy, South Dakota, 2018 (weighted)

<table>
<thead>
<tr>
<th>Behavior</th>
<th>No depression during pregnancy</th>
<th>Depression during pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke 3-Mo. Before Preg.**</td>
<td>20.8</td>
<td>46.0</td>
</tr>
<tr>
<td>Illicit Drugs 3-Mo. Before Preg.**</td>
<td>6.9</td>
<td>16.7</td>
</tr>
<tr>
<td>Emotional Abuse During Pregnancy**</td>
<td>5.3</td>
<td>15.4</td>
</tr>
<tr>
<td>C-Section Delivery*</td>
<td>23.1</td>
<td>32.3</td>
</tr>
<tr>
<td>NICU Admission**</td>
<td>7.3</td>
<td>16.3</td>
</tr>
<tr>
<td>ACE Score 4+ **</td>
<td>16.9</td>
<td>50.0</td>
</tr>
</tbody>
</table>

* p-value < 0.05   ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
NICU = neonatal intensive care unit; ACE = adverse childhood experiences

References
Chapter 6: Prenatal care: entry and adequacy

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
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<tbody>
<tr>
<td><strong>Entry into prenatal care</strong></td>
<td></td>
</tr>
<tr>
<td>Early entry (within first trimester) *</td>
<td>83.3 (80.6-86.0, 9191)</td>
</tr>
<tr>
<td>Late entry (after first trimester)</td>
<td>15.6 (13.0-18.2, 1721)</td>
</tr>
<tr>
<td>No prenatal care</td>
<td>1.1 (0.3-1.9, 122)^</td>
</tr>
<tr>
<td><strong>Percent of visits attended</strong></td>
<td></td>
</tr>
<tr>
<td>Less than 50% or no prenatal care</td>
<td>4.8 (3.4-6.1, 533)</td>
</tr>
<tr>
<td>50-79%</td>
<td>12.9 (10.7-15.1, 1435)</td>
</tr>
<tr>
<td>80% or greater</td>
<td>82.3 (79.9-84.8, 9180)</td>
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<tr>
<td><strong>Adequacy of prenatal care (Kotelchuck Index)</strong>*</td>
<td></td>
</tr>
<tr>
<td>Inadequate</td>
<td>14.3 (12.0-16.6, 1591)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>11.7 (9.6-13.9, 1309)</td>
</tr>
<tr>
<td>Adequate</td>
<td>50.6 (47.0-54.1, 5637)</td>
</tr>
<tr>
<td>More than adequate</td>
<td>23.4 (20.4-26.5, 2611)</td>
</tr>
</tbody>
</table>

* Trimester is defined as 13 weeks in length for this report. Data obtained from survey and vital records.

** Adjusted for when prenatal care began.

*** Kotelchuck Index of adequacy or prenatal care is calculated from birth certificate data, see Methods.

^ Too few cases to meet precision standard, interpret with caution.

Significance

Prenatal care, beginning in the first trimester, is essential for detecting problems early in fetal development. Women who receive no prenatal care are more likely to have stillbirths, preterm births, and low birthweight infants (1). For this reason, the U.S. Healthy People 2020 has set a target rate for the percent of infants born to women who begin receiving prenatal care in the first trimester at 78% (2).

**PRAMS asked women:**

Q19  How many weeks or months pregnant were you when you had your first visit for prenatal care?

**Healthy People 2020 Objectives**

- MICH-10.1 Increase prenatal care beginning in the first trimester to 78% of live births.
- MICH-10.2 Increase early and adequate prenatal care to 78% of live births.

**Definitions**

A trimester is any of three periods, approximately three months each, into which a human pregnancy is divided.

**Prenatal Care Entry**

**Prevalence and Trends (Figure 6.1)**

The percentage of South Dakota mothers who began prenatal care in the first trimester has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 78% has been achieved for all years.
Figure 6.1: Mothers who began prenatal care in the first trimester by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 6.2)
- Overall prevalence of South Dakota mothers who began prenatal care in the first trimester was 83.3%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with beginning prenatal care in the first trimester included maternal race, education, marital status, and household income.
- Mothers who were white, had more years of education, were married, and had greater household income had higher prevalences of beginning prenatal care in the first trimester compared with their counterparts.

Risk Behaviors and Outcomes by Starting PNC in First Trimester (Figure 6.3)
Mothers who started PNC in the 1st trimester, compared to mothers who did not start PNC in the 1st trimester, were significantly (p-value less than 0.05) more likely to report that:
- They drank alcohol the 3 months before pregnancy (69.5% vs. 53.4%).

Mothers who started PNC in the 1st trimester, compared to mothers who did not start PNC in the 1st trimester, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (10.4% vs. 25.8%).
- They used illicit drugs the 3 months before pregnancy (7.0% vs. 16.8%).
- They attended less than 80% of their prenatal visits (15.6% vs. 29.0%).
- They did not have their teeth cleaned during pregnancy (47.2% vs. 70.5%).
- They never breastfed their infant (6.4% vs. 17.8%).
Figure 6.2: Percentage of mothers who began prenatal care in the first trimester by demographic characteristics, South Dakota, 2018 (weighted)

- **Race**: White, Non-Hisp. 85.1, Amer. Indian 76.3, Other Races 82.3
- **Ethnicity**: Hisp. 82.7, Non-Hisp. 83.4
- **Age**: <20 yrs 70.6, 20-24 yrs 84.5, 25-29 yrs 84.3, 30-34 yrs 84.8, >=35 yrs 79.5
- **Education**: <12 yrs 66.1, 12 yrs 79.5, >12 yrs 90.3
- **Marital Status**: Not Married 75.1, Married 87.7
- **Annual Income**: <$16K 66.1, $16,001-$28K 78.6, $28,001-$48K 88.7, $48,001-$73K 89.4, $73,001+ 93.3
- **Region**: Sturgis 79.0, Pierre 79.8, Aberdeen 80.7, Watertown 84.8, Sioux Falls 87.3, Mitchell 77.3, Rapid City 81.5

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.

Healthy People 2020 (78%)
Figure 6.3: Risk behaviors and outcomes by mothers who began prenatal care in the first trimester, South Dakota, 2018 (weighted)

- ** Not Insured Before Preg.**: 10.4% began PNC, 25.8% did not begin PNC.
- ** Alcohol 3-Mo. Before Preg.**: 53.4% began PNC, 69.5% did not begin PNC.
- ** Illicit Drugs 3-Mo. Before Preg.**: 16.8% began PNC, 7.0% did not begin PNC.
- ** Attended <80% of PNC Visits**: 29.0% began PNC, 15.6% did not begin PNC.
- ** Teeth Not Cleaned During Preg.**: 70.5% began PNC, 47.2% did not begin PNC.
- ** Never Breast-Fed**: 17.8% began PNC, 6.4% did not begin PNC.

** p-value < 0.01
p-value based on Rao-Scott chi-square test.
Prenatal Care Adequacy (attended greater than 80% of prenatal care visits)

Prevalence and Trends (Figure 6.4)
The percentage of South Dakota mothers who attended 80% or more of their prenatal care visits has decreased slightly over time (p-value for linear trend equal to 0.05). The Healthy People 2020 goal of 78% has been achieved for all years.

Figure 6.4: Mothers who attended 80% or more of their prenatal visits by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 6.5)
- Overall prevalence of South Dakota mothers who attended 80% or more of their prenatal care visits was 82.3%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with attending 80% or more of prenatal care visits included maternal race, education, marital status, household income, and region of the state that the mother resided.
- Mothers who were white, had more years of education, were married, and had greater household income had higher prevalences of attending 80% or more of prenatal care compared with their counterparts. The Watertown region had the highest prevalence, and the Pierre region the lowest, of attending 80% or more of prenatal care visits.

Risk Behaviors and Outcomes by Attending 80% or More of PNC Visits (Figure 6.6)
Mothers who attended 80% or more of PNC visits, compared to mothers who did not attend 80% or more of PNC visits, were significantly (p-value less than 0.05) more likely to report that:
- They drank alcohol the 3 months before pregnancy (69.2% vs. 56.9%).
- They smoked the 3 months before pregnancy (20.9% vs. 43.4%).
- They used illicit drugs the 3 months before pregnancy (7.5% vs. 14.4%).
- They started prenatal care after the first trimester or had no prenatal care (14.4% vs. 27.2%).
- They did not have their teeth cleaned during pregnancy (48.3% vs. 64.1%).
- They suffered emotional abuse during pregnancy (5.7% vs. 13.2%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (19.3% vs. 39.9%).
- They never breastfed their infant (7.1% vs. 14.4%).
- They had a high ACE score (4+) (20.6% vs. 29.9%).
Figure 6.5: Percentage of mothers who attended 80% or more of their prenatal care visits by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.

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Healthy People 2020 (78%)
Figure 6.6: Risk behaviors and outcomes by mothers who attended 80% or more of their prenatal care visits, South Dakota, 2018 (weighted)

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Attended 80% or more of PNC visits</th>
<th>Did not attend 80% or more of PNC visits</th>
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</thead>
<tbody>
<tr>
<td>Smoke 3-Mo. Before Preg.**</td>
<td>20.9</td>
<td>43.4</td>
</tr>
<tr>
<td>Alcohol 3-Mo. Before Preg.**</td>
<td>7.5</td>
<td>14.4</td>
</tr>
<tr>
<td>Illicit Drugs 3-Mo. Before Preg.**</td>
<td>14.4</td>
<td>27.2</td>
</tr>
<tr>
<td>Delayed or No PNC **</td>
<td>14.4</td>
<td>27.2</td>
</tr>
<tr>
<td>Teeth Not Cleaned During Preg.**</td>
<td>14.4</td>
<td>27.2</td>
</tr>
<tr>
<td>Emotional Abuse During Pregnancy**</td>
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<td>14.4</td>
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<tr>
<td>Diabetes, Hypertension, or Depression During Preg.**</td>
<td>14.4</td>
<td>27.2</td>
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<tr>
<td>Never Breast-Fed **</td>
<td>7.5</td>
<td>14.4</td>
</tr>
<tr>
<td>ACE Score 4+ *</td>
<td>20.6</td>
<td>29.9</td>
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* p-value < 0.05      ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
PNC = prenatal care, ACE = adverse childhood experiences

References


# Chapter 7: Prenatal care: barriers

## Measure | % of women (95% CI, N)
--- | ---
**Desire for prenatal care**

*Among women who went for prenatal care,*

- Started as early as they wanted 88.3 (86.0-90.6, 9689)
- Went to all recommended visits 94.4 (92.9-95.8, 10214)

*Among women who did not get prenatal care as early as they wanted,* barriers were:

- Did not know she was pregnant 43.6 (33.5-53.6, 596)
- Could not get an appointment when wanted 36.0 (25.7-46.3, 479)
- Doctor or health plan would not start care as early as wanted 23.8 (14.0-33.5, 313)
- Had too many other things going on 19.2 (11.8-26.6, 254)
- Did not have enough money or insurance to pay for visits 19.1 (9.8-28.4, 253)
- Did not have any transportation to get to the clinic or doctor’s office 17.9 (10.6-25.2, 240)
- Did not have a Medicaid card 14.7 (7.1-22.3, 198)
- Did not want anyone to know she was pregnant 10.9 (5.2-16.7, 143)
- Did not have anyone to take care of children 8.5 (3.6-13.3, 111)
- Could not take time off from work or school 6.6 (2.9-10.3, 87)
- Afraid she would be reported for using alcohol/drugs during pregnancy 5.3 (1.6-9.0, 69)^
- Did not want prenatal care 4.7 (0.8-8.6, 62)^

*Among women who did not go to all recommended visits,* barriers were:

- Too many other things going on 41.9 (28.3-55.4, 235)
- Did not have any transportation to get to clinic or doctor’s office 31.4 (20.2-42.6, 180)
- Could not take time off from work or school 18.8 (8.8-28.7, 107)
- Did not have enough money or insurance to pay for visits 17.5 (5.9-29.1, 98)^
- Could not get an appointment when wanted one 13.6 (6.9-20.3, 76)
- Did not have Medicaid card 12.1 (1.0-23.2, 69)^
- Did not have anyone to take care of children 10.6 (4.3-16.8, 59)^
- Did not want prenatal care 5.5 (0.0-11.8, 31)^
- Afraid she would be reported for using alcohol/drugs during pregnancy 2.9 (0.0-6.6, 16)^

*Among women who received prenatal care,* topics discussed with, or asked about by a health care worker during prenatal care visits:

- Smoking 98.2 (97.4-99.0, 10788)
- Drinking alcohol 97.7 (96.8-98.6, 10680)
- Use of prescription medication 97.4 (96.4-98.3, 10695)
- Breastfeeding 92.4 (90.3-94.5, 10130)
- Symptoms of depression 87.1 (84.6-89.6, 9568)
- Emotional or physical abuse 85.0 (82.3-87.6, 9283)
- Postpartum birth control 83.6 (80.7-86.4, 9085)
- Illegal drugs 84.5 (81.9-87.1, 9197)
- Weight gain during pregnancy 62.1 (58.6-65.6, 6751)
- HIV testing 56.9 (53.3-60.5, 6090)

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^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

**PRAMS asked women:**

Q20 Did you get prenatal care as early in your pregnancy as you wanted?
Q21 Did any of these things keep you from getting prenatal care when you wanted it?… [List]
Q22 *During any of your prenatal care visits,* did a doctor, nurse, or other health care worker ask you any of the things listed below? [List]
Q69 Were you able to go to all of your recommended prenatal visits?
Q70 Did any of these things keep you from going to your recommended prenatal visits? [List]
Started Prenatal Care as Early as Wanted

Prevalence and Trends (Figure 7.1)
The percentage of South Dakota mothers who started prenatal care as early as they wanted has not changed (p-value for linear trend greater than 0.05).

Figure 7.1: Mothers who received prenatal care as early as they wanted by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 7.2)
- Overall prevalence of South Dakota mothers who started prenatal care as early as they wanted was 88.3%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with receiving prenatal care as early as they wanted included maternal race, age, education, marital status, household income, and region.
- Mothers who were white or of other races, older, had more years of education, were married, and had greater household income had a higher prevalence of receiving prenatal care as early as they wanted compared with their counterparts. Mothers who resided in the Watertown region had the highest proportion of mothers who started prenatal care as early as they wanted.

Risk Behaviors and Outcomes (Figure 7.3)
Mothers who started prenatal care as early as they wanted, compared to mothers who did not start prenatal care as early as they wanted, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (11.5% vs. 23.0%).
- They smoked the 3 months before pregnancy (22.4% vs. 41.8%).
- They used illicit drugs the 3 months before pregnancy (6.7% vs. 22.7%).
- They started prenatal care after the first trimester or had no prenatal care (10.4% vs. 54.7%).
- They attended less than 80% of their prenatal visits (16.0% vs. 27.8%).
- They did not have their teeth cleaned during pregnancy (49.2% vs. 63.9%).
- They never breastfed their infant (6.9% vs. 17.3%).
Figure 7.2: Percentage of mothers who received prenatal care as early as they wanted by demographic characteristics, South Dakota, 2018 (weighted)

- ** Race: 
  - Native American: 78.6%
  - Other Races: 89.1%
  - White, Non-Hisp.: 90.4%

- ** Ethnicity: 
  - Non-Hisp.: 88.3%
  - Hisp.: 87.3%

- ** Age: 
  - <20 yrs: 68.9%
  - 20-24 yrs: 85.0%
  - 25-29 yrs: 91.3%
  - 30-34 yrs: 88.9%
  - >=35 yrs: 91.0%

- ** Education: 
  - <12 yrs: 84.0%
  - 12 yrs: 80.8%
  - >12 yrs: 91.9%

- ** Marital Status: 
  - Not Married: 80.6%
  - Married: 92.5%

- ** Annual Income: 
  - <$16K: 76.9%
  - $16,001-$28K: 78.7%
  - $28,001-$48K: 87.2%
  - $48,001-$73K: 96.2%
  - $73,001+: 95.0%

- ** Region: 
  - Rapid City: 82.3%
  - Mitchell: 89.0%
  - Sioux Falls: 91.5%
  - Watertown: 95.3%
  - Aberdeen: 86.2%
  - Pierre: 79.6%
  - Sturgis: 84.3%

** p-value < 0.01, * p-value < 0.05 based on Rao-Scott chi-square test. 
++ p-value < 0.01, + p-value < 0.05 based on logistic regression results for linear trend.
Figure 7.3: Risk behaviors and outcomes by mothers who began prenatal care as early as they wanted, South Dakota, 2018 (weighted)

- **Not Insured Before Preg.**
  - Began PNC as early as wanted: 11.5%
  - Did not begin PNC as early as wanted: 23.0%

- **Smoke 3-Mo. Before Preg.**
  - Began PNC as early as wanted: 22.4%
  - Did not begin PNC as early as wanted: 41.8%

- **Illicit Drugs 3-Mo. Before Preg.**
  - Began PNC as early as wanted: 6.7%
  - Did not begin PNC as early as wanted: 22.7%

- **Delayed or No PNC**
  - Began PNC as early as wanted: 10.4%
  - Did not begin PNC as early as wanted: 54.7%

- **Attended <80% of PNC Visits**
  - Began PNC as early as wanted: 16.0%
  - Did not begin PNC as early as wanted: 27.8%

- **Teeth Not Cleaned During Preg.**
  - Began PNC as early as wanted: 49.2%
  - Did not begin PNC as early as wanted: 63.9%

- **Never Breast-Fed**
  - Began PNC as early as wanted: 6.9%
  - Did not begin PNC as early as wanted: 17.3%

* p-value < 0.05  ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
PNC = prenatal care
Chapter 8: Flu vaccinations

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
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<tbody>
<tr>
<td>Flu shot offered during the 12 months before delivery of the infant</td>
<td>91.0 (89.1-93.0, 10158)</td>
</tr>
<tr>
<td>Flu shot received the 12 months before the infant’s birth</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>25.3 (22.2-28.4, 2795)</td>
</tr>
<tr>
<td>Yes, before pregnancy</td>
<td>13.3 (10.9-15.6, 1465)</td>
</tr>
<tr>
<td>Yes, during pregnancy</td>
<td>61.5 (58.0-64.9, 6791)</td>
</tr>
</tbody>
</table>

Significance
Maternal influenza vaccination has been shown to be associated with a decreased risk of influenza and its complications in pregnant women and their infants for the first 6 months of life. Infants of mothers who were infected with influenza during pregnancy were more likely to be born preterm and have a low birthweight (1).

PRAMS asked women:
Q23 During the 12 months before the delivery of your new baby, did a doctor, nurse, or other health care worker offer you a flu shot or tell you to get one?
Q24 During the 12 months before the delivery of your new baby, did you get a flu shot? Check ONE answer [List]

Healthy People 2020 Objectives
- IID-12.10 Increase the percentage of pregnant women who are vaccinated against seasonal influenza to 80.0%.

Flu Shot 12 Months Before Delivery
Prevalence and Trends (Figure 8.1)
The percentage of South Dakota mothers who received a flu vaccine the 12 months before the delivery of the infant (either before or during pregnancy has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 80% has not been achieved in any years.

Figure 8.1: Mothers who received a flu vaccine the 12 months before the delivery of the infant (either before or during pregnancy) by year, South Dakota, 2017–2018 (weighted)
Demographic Characteristics (Figure 8.2)
- Overall prevalence of South Dakota mothers who received a flu vaccine the 12 months before the delivery of the infant (either before or during pregnancy) was 74.7%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with receiving a flu vaccine the 12 months before the delivery of the infant included maternal race, education, marital status, household income, and region of the state that the mother resided.
- Mothers who were white or of other races, had more years of education, were married, and had greater household income had a higher prevalence of receiving a flu vaccine the 12 months before the delivery of the infant compared with their counterparts. Mothers residing in the Sioux Falls and Watertown regions of South Dakota had a higher prevalence of receiving a flu vaccine the 12 months before the delivery of the infant.

Risk Behaviors and Outcomes (Figure 8.3)
 Mothers who had a flu shot 12 months before delivery, compared to mothers who did not have a flu shot before delivery, were significantly (p-value less than 0.05) more likely to report that:
- They drank alcohol the 3 months before pregnancy (69.5% vs. 59.5%).

Mothers who had a flu shot 12 months before delivery, compared to mothers who did not have a flu shot before delivery, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (10.9% vs. 18.9%).
- They smoked the 3 months before pregnancy (23.0% vs. 31.3%).
- They used illicit drugs the 3 months before pregnancy (7.1% vs. 12.8%).
- They started prenatal care after the first trimester or had no prenatal care (11.1% vs. 33.0%).
- They attended less than 80% of their prenatal visits (13.1% vs. 31.0%).
- They did not have their teeth cleaned during pregnancy (47.3% vs. 63.7%).
- They had a high ACE score (4+) (20.3% vs. 27.7%).
Figure 8.2: Percentage of mothers who received a flu vaccine in the 12 months before the infant’s birth by demographic characteristics, South Dakota, 2018 (weighted)

** Race
- White, Non-Hisp.: 77.0%
- Amer. Indian: 62.9%
- Other Races: 77.8%

** Ethnicity
- Hisp.: 72.7%
- Non-Hisp.: 74.9%

** Age
- <20 yrs: 61.6%
- 20-24 yrs: 72.2%
- 25-29 yrs: 75.0%
- 30-34 yrs: 78.8%
- >=35 yrs: 71.5%

++ Education
- <12 yrs: 61.9%
- 12 yrs: 68.2%
- >12 yrs: 79.5%

** Marital Status
- Not Married: 66.5%
- Married: 79.3%

** Annual Income
- <$16K: 61.7%
- $16,001-$28K: 63.7%
- $28,001-$48K: 71.7%
- $48,001-$73K: 81.4%
- $73,001+: 88.0%

** Region
- Sturgis: 68.5%
- Pierre: 59.8%
- Aberdeen: 66.3%
- Watertown: 78.4%
- Sioux Falls: 81.2%
- Mitchell: 74.9%
- Rapid City: 72.3%
Figure 8.3: Risk behaviors and outcomes by mothers who received a flu vaccine the 12 months before the infant’s birth, South Dakota, 2018 (weighted)

- Not Insured Before Preg.: *10.9%, 18.9%
- Smoke 3-Mo. Before Preg.: *23.0%, 31.3%
- Alcohol 3-Mo. Before Preg.: *69.5%, 59.5%
- Illicit Drugs 3-Mo. Before Preg.: *7.1%, 12.8%
- Delayed or No PNC: **11.1%, 33.0%
- Attended <80% of PNC Visits: **13.1%, 31.0%
- Teeth Not Cleaned During Preg.: **47.3%, 63.7%
- ACE Score 4+: *20.3%, 27.7%

* p-value < 0.05  ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
ACE = adverse childhood experiences

References
Chapter 9: Oral health

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Had teeth cleaned 12 months before getting pregnant</td>
<td>65.2 (61.1-69.3, 5074)</td>
</tr>
<tr>
<td>Had teeth cleaned during most recent pregnancy</td>
<td>48.7 (45.1-52.3, 5428)</td>
</tr>
<tr>
<td>Barriers to dental care</td>
<td></td>
</tr>
<tr>
<td>Could not afford to go to the dentist/dental clinic</td>
<td>19.7 (16.5-22.8, 2139)</td>
</tr>
<tr>
<td>Did not think it was safe to go to the dentist during pregnancy</td>
<td>10.9 (8.8-13.0, 1153)</td>
</tr>
<tr>
<td>Could not find a dentist/dental clinic that would take Medicaid patients</td>
<td>6.0 (4.4-7.7, 637)</td>
</tr>
<tr>
<td>Could not find a dentist/dental clinic that would take pregnant patients</td>
<td>3.4 (2.4-4.4, 365)</td>
</tr>
</tbody>
</table>

Significance
Oral health during pregnancy is just as important to consider as other aspects of health (1). If dental diseases during pregnancy are left untreated, they can affect not only the mother, but the fetus as well. One of the most common untreated dental diseases is periodontitis. Periodontitis is associated with both preterm birth and low birthweight, which are known to be leading causes of infant mortality (2).

PRAMS asked women:
Q10 In the 12 months before you got pregnant with your new baby, did you have any health care visits with a doctor, nurse, or other health care worker, including a dental or mental health worker?
Q11 What type of health care visit did you in the 12 months before you got pregnant with your new baby? [List]
Q25 During your most recent pregnancy, did you have your teeth cleaned by a dentist or dental hygienist?
Q26 Did any of the following things make it hard for you to go to a dentist or dental clinic during your most recent pregnancy? [List]

Healthy People 2020 Objectives
- OH-10.1 Increase the proportion of children, adolescents, and adults who used the oral health care system in the past year to 49.0%.

Teeth Cleaned During Pregnancy
Prevalence and Trends (Figure 9.1)
The percentage of South Dakota mothers who had their teeth clean during their most recent pregnancy has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 49% has not been achieved in either year.
Demographic Characteristics (Figure 9.2)
- Overall prevalence of South Dakota mothers who had their teeth clean during their most recent pregnancy was 48.7%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with having their teeth clean during their most recent pregnancy included maternal race, ethnicity, age, education, marital status, household income, and region of the state that the mother resided.
- Mothers who were white, non-Hispanic, older, had more years of education, were married, had greater household income, and resided in the Sioux Falls region had a higher prevalence of having their teeth clean during their most recent pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 9.3)
Mothers who had had their teeth cleaned during pregnancy, compared to mothers who did not have their teeth cleaned during pregnancy, were significantly (p-value less than 0.05) more likely to report that:
- They drank alcohol the 3 months before pregnancy (72.7% vs. 61.7%).
- Their infant does not sleep alone in the mother’s room (61.5% vs. 52.6%).

Mothers who had their teeth cleaned during pregnancy, compared to mothers who did not have their teeth cleaned during pregnancy, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (5.8% vs. 20.0%).
- They smoked the 3 months before pregnancy (13.5% vs. 36.1%).
- They used illicit drugs the 3 months before pregnancy (4.1% vs. 13.0%).
- They started prenatal care after the first trimester or had no prenatal care (10.0% vs. 22.9%).
- They attended less than 80% of their prenatal visits (13.0% vs. 22.1%).
- They suffered emotional abuse during pregnancy (3.9% vs. 9.9%).
- Their infant was low birth weight (<2500 grams) (3.4% vs. 6.3%).
- They never breastfed their infant (4.3% vs. 12.2%).
- Their baby is exposed to smoke (1.2% vs. 4.1%, interpret these percentages with caution).
- They had a high ACE score (4+) (15.7% vs. 28.4%).
Figure 9.2: Percentage of mothers who had their teeth cleaned during their most recent pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

- **Statewide**: 48.7%
  - **Race**
    - White, Non-Hisp.: 53.3%
    - Amer. Indian: 38.4%
    - Other Races: 34.5%
  - **Ethnicity**
    - Hisp.: 34.0%
    - Non-Hisp.: 49.6%
  - **Age**
    - <20 yrs: 30.3%
    - 20-24 yrs: 33.1%
    - 25-29 yrs: 49.9%
    - 30-34 yrs: 59.2%
    - >=35 yrs: 48.2%
  - **Education**
    - <12 yrs: 28.4%
    - 12 yrs: 32.6%
    - >12 yrs: 58.7%
  - **Marital Status**
    - Not Married: 33.7%
    - Married: 57.0%
  - **Annual Income**
    - <$16K: 26.9%
    - $16,001-$28K: 34.2%
    - $28,001-$48K: 43.4%
    - $48,001-$73K: 49.5%
    - $73,001+: 77.2%
  - **Region**
    - Sturgis: 43.2%
    - Pierre: 41.2%
    - Aberdeen: 41.6%
    - Watertown: 45.8%
    - Sioux Falls: 57.7%
    - Mitchell: 44.1%
    - Rapid City: 45.2%

* p-value < 0.05, ** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.

Healthy People 2020 (49%)
Figure 9.3: Risk behaviors and outcomes by mothers who had their teeth cleaned during their most recent pregnancy, South Dakota, 2018 (weighted)

References


Chapter 10: Abuse

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abuse by partner/husband</td>
<td></td>
</tr>
<tr>
<td>Physical, before pregnancy</td>
<td>2.5 (1.5-3.5, 281)</td>
</tr>
<tr>
<td>Physical, during pregnancy</td>
<td>2.6 (1.4-3.8, 288)</td>
</tr>
<tr>
<td>Sexual abuse, during pregnancy</td>
<td>1.3 (0.5-2.0, 140)*</td>
</tr>
<tr>
<td>Emotional abuse during pregnancy</td>
<td>7.0 (5.2-8.7, 770)</td>
</tr>
<tr>
<td>Tried to control daily activities</td>
<td>4.4 (3.1-5.7, 488)</td>
</tr>
<tr>
<td>Was threatened or made to feel unsafe</td>
<td>4.6 (3.2-6.1, 512)</td>
</tr>
<tr>
<td>Was frightened for her or family’s safety</td>
<td>4.8 (3.3-6.4, 533)</td>
</tr>
</tbody>
</table>

Background
Domestic abuse during pregnancy is linked to negative effects on maternal health, such as inconsistent access to prenatal care, insufficient weight gain, substance use, inadequate nutrition, and mental health concerns (1-3). Effects of domestic abuse on neonatal health include insufficient size for gestational age, preterm birth, low birth weight, and an increased risk of mortality (1,4).

PRAMS asked women:
Q44 In the 12 months before you got pregnant with your new baby, did any of the following people push, hit, slap, kick, choke, or physically hurt you in any other way?
Q45 During your most recent pregnancy, did any of the following people push, hit, slap, kick, choke, or physically hurt you in any other way? [husband/partner, ex-husband/partner, someone else]
Q46 During your most recent pregnancy, did any of the following things happen to you? [My husband or partner threatened me or made me feel unsafe in some way; I was frightened for my safety or my family’s safety because of the anger or threats of my husband or partner; My husband or partner tried to control my daily activities, for example, controlling who I could talk to or where I could go; My husband or partner forced me to take part in touching or any sexual activity when I did not want to].

Healthy People 2020 Objectives
- IVP-39.1 Reduce physical violence by current or former intimate partners (developmental).
- IVP-39.2 Reduce sexual violence by current or former intimate partners (developmental).
- IVP-39.3 Reduce psychological abuse by current or former intimate partners (developmental).

Definitions:
Sexual abuse was defined as husband/partner forcing the woman to take part in sexual activity when she did not want to.
Emotional abuse was defined as the husband/partner either trying to control the mother’s daily activities, threatening the mother in a way that made her feel unsafe, or frightening the mother for her or her family’s safety.
Emotional Abuse During Pregnancy
Prevalence and Trends (Figure 10.1)
The percentage of South Dakota mothers who were emotionally abused during pregnancy has not changed (p-value for linear trend greater than 0.05).

Figure 10.1: Mothers who were emotionally abused during pregnancy by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 10.2)
- Overall prevalence of South Dakota mothers who were emotionally abused during pregnancy was 7.0%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with being emotionally abused during pregnancy included maternal race, age, education, marital status, and household income.
- Mothers who were American Indian, younger, had less years of education, were not married, and had less household income had a higher prevalence of emotional abuse during pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 10.3)
 Mothers who were emotionally abused during pregnancy, compared to mothers who were not emotionally abused during pregnancy, were significantly (p-value less than 0.05) more likely to report that:
- They were uninsured before pregnancy (23.7% vs. 12.5%).
- They smoked the 3 months before pregnancy (66.5% vs. 21.9%).
- They used illicit drugs the 3 months before pregnancy (34.6% vs. 6.8%).
- They attended less than 80% of their prenatal visits (33.2% vs. 16.4%).
- They did not have their teeth cleaned during pregnancy (72.4% vs. 49.5%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (50.7% vs. 30.3%).
- They had a high ACE score (4+) (58.6% vs. 19.8%).
Figure 10.2: Percentage of mothers who were emotionally abused during pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

- **Statewide**: 7.0%
- **Race**: White, Non-Hisp. 4.3%, Amer. Indian 19.6%, Other Races 4.3%
- **Ethnicity**: Hisp.^ 5.9%, Non-Hispanic 7.0%
- **Age**: <20 yrs^ 21.7%, 20-24 yrs 9.0%, 25-29 yrs 5.9%, 30-34 yrs 4.2%, >=35 yrs^ 8.5%
- **Education**: <12 yrs 13.5%, 12 yrs 5.8%, >12 yrs 6.0%
- **Marital Status**: Not Married 15.6%, Married 2.1%
- **Annual Income**: <=$16K 14.8%, $16,001-$28K^ 10.0%, $28,001-$48K^ 5.9%, $48,001-$73K^ 2.5%, $73,001+^ 2.2%
- **Region**: Sturgis^ 8.4%, Pierre 9.9%, Aberdeen^ 1.3%, Watertown^ 4.9%, Sioux Falls 6.7%, Mitchell^ 3.9%, Rapid City 11.2%

* p-value < 0.05, ** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
**Figure 10.3:** Risk behaviors and outcomes by mothers who were emotionally abused during pregnancy, South Dakota, 2018 (weighted)

- **Not Insured Before Preg.**
  - Not emotionally abused during pregnancy: 12.5%
  - Emotionally abused during pregnancy: 23.7%

- **Smoke 3-Mo. Before Preg.**
  - Not emotionally abused during pregnancy: 21.9%
  - Emotionally abused during pregnancy: 66.5%

- **Illicit Drugs 3-Mo. Before Preg.**
  - Not emotionally abused during pregnancy: 6.8%
  - Emotionally abused during pregnancy: 34.6%

- **Attended <80% of PNC Visits**
  - Not emotionally abused during pregnancy: 16.4%
  - Emotionally abused during pregnancy: 33.2%

- **Teeth Not Cleaned During Preg.**
  - Not emotionally abused during pregnancy: 30.3%
  - Emotionally abused during pregnancy: 50.7%

- **Diabetes, Hypertension, or Depression During Preg.**
  - Not emotionally abused during pregnancy: 19.8%
  - Emotionally abused during pregnancy: 58.6%

- **ACE Score 4+**
  - Not emotionally abused during pregnancy: 16.4%
  - Emotionally abused during pregnancy: 66.5%

* p-value < 0.05  ** p-value < 0.01

p-value based on Rao-Scott chi-square test.
PNC = prenatal care, ACE = adverse childhood experiences

**References**


## Chapter 11: Tobacco use

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cigarette use, maternal</strong></td>
<td></td>
</tr>
<tr>
<td>In the past 2 years</td>
<td>27.5 (24.3-30.7, 3020)</td>
</tr>
<tr>
<td>3 months before pregnancy</td>
<td>24.9 (21.8-28.0, 2735)</td>
</tr>
<tr>
<td>Last 3 months of pregnancy</td>
<td>10.4 (8.2-12.7, 1144)</td>
</tr>
<tr>
<td>Postpartum</td>
<td>16.4 (13.7-19.1, 1800)</td>
</tr>
<tr>
<td><em>Among women who smoked in the past 2 years, amount smoked 3 months before pregnancy</em></td>
<td></td>
</tr>
<tr>
<td>None (did not smoke then)</td>
<td>9.2 (4.9-13.5, 278)</td>
</tr>
<tr>
<td>Less than 5 cigarettes per day</td>
<td>38.2 (31.6-44.8, 1151)</td>
</tr>
<tr>
<td>6 to 10 cigarettes per day</td>
<td>25.0 (18.9-31.1, 754)</td>
</tr>
<tr>
<td>11 cigarettes or more per day</td>
<td>27.5 (20.8-34.3, 830)</td>
</tr>
<tr>
<td><em>Among women who smoked in the past 2 years, amount smoked last 3 months of pregnancy</em></td>
<td></td>
</tr>
<tr>
<td>None (did not smoke then)</td>
<td>61.8 (54.9-68.8, 1853)</td>
</tr>
<tr>
<td>Less than 5 cigarettes per day</td>
<td>24.8 (18.8-30.8, 743)</td>
</tr>
<tr>
<td>6 to 10 cigarettes per day</td>
<td>7.3 (3.5-11.1, 219)</td>
</tr>
<tr>
<td>11 cigarettes or more per day</td>
<td>6.1 (2.2-9.9, 182)^</td>
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<tr>
<td><em>Among women who smoked in the past 2 years, amount smoked now</em></td>
<td></td>
</tr>
<tr>
<td>None (did not smoke then)</td>
<td>40.0 (33.0-47.0, 1200)</td>
</tr>
<tr>
<td>Less than 5 cigarettes per day</td>
<td>29.4 (23.2-35.5, 881)</td>
</tr>
<tr>
<td>6 to 10 cigarettes per day</td>
<td>20.1 (14.1-26.2, 604)</td>
</tr>
<tr>
<td>11 cigarettes or more per day</td>
<td>10.5 (5.9-15.1, 316)</td>
</tr>
<tr>
<td><strong>Other tobacco use, maternal use among all women</strong></td>
<td></td>
</tr>
<tr>
<td>E-cigarettes or other electronic nicotine products in past 2 years</td>
<td>6.2 (4.3-8.1, 681)</td>
</tr>
<tr>
<td>Hookah use past 2 years</td>
<td>2.4 (1.3-3.5, 259)</td>
</tr>
<tr>
<td><em>Among women who used e-cigarettes or other nicotine products in the past 2 years, frequency of use the 3 months before pregnancy:</em></td>
<td></td>
</tr>
<tr>
<td>More than once a day</td>
<td>24.2 (10.0-38.5, 165)^</td>
</tr>
<tr>
<td>Once a day</td>
<td>0.8 (0.0-2.4, 6)^</td>
</tr>
<tr>
<td>2-6 days a week</td>
<td>12.0 (2.4-21.5, 82)^</td>
</tr>
<tr>
<td>1 day a week or less</td>
<td>33.8 (17.5-50.1, 230)</td>
</tr>
<tr>
<td>Did not use e-cigarette or other electronic nicotine products then</td>
<td>29.2 (15.6-42.8, 199)</td>
</tr>
</tbody>
</table>

^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

### Significance

Tobacco use during pregnancy is associated with developmental problems of the fetal brain and kidneys, low birthweight, and preterm birth (1,2). Preterm birth is one of the leading causes of death in the neonatal period (3).

### PRAMS asked women:

Q29 Have you smoked any cigarettes in the *past 2 years*?

Q30 In the *3 months before* you got pregnant, how many cigarettes did you smoke on an average day? [List]

Q31 In the *last 3 months* of your pregnancy, how many cigarettes did you smoke on an average day? [List]

Q36 How many cigarettes do you smoke on an average day *now*? [postpartum] [List]

Q37 Have you used any of the following products in the *past 2 years*? [e-cigarettes, hookah]

Q38 During the *3 months before* you got pregnant, on average, how often did you use e-cigarettes or other electronic nicotine products? [List]

Q39 During the *last 3 months* of your pregnancy, on average, how often did you use e-cigarettes or other electronic nicotine products? [List]
Healthy People 2020 Objectives

- **MICH-11.3** Increase abstinence from smoking cigarettes during pregnancy to 99% (*prevalence of smoking during pregnancy to 1%*).
- **MICH 16.3** Increase the proportion of women delivering a live birth who did not smoke prior to pregnancy to 88% (*prevalence of smoking before pregnancy to 12%*).

Smoked Three Months Before Pregnancy

**Prevalence and Trends (Figure 11.1)**

The percentage of South Dakota mothers who smoked three months before pregnancy has not changed (*p*-value for linear trend greater than 0.05). The Healthy People 2020 goal of 88% of women delivering a live birth not smoking prior to pregnancy (12% smoking prevalence) has not been achieved for any year.

**Figure 11.1:** Mothers who smoked the three months before pregnancy by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 11.2)

- Overall prevalence of South Dakota mothers who smoked the three months before pregnancy was 24.9%.
- Demographic characteristics that were significantly (*p*-value less than 0.05) associated with smoking the three months before pregnancy included maternal race, age, education, marital status, household income, and region of the state that the mother resided.
- Mothers who were American Indian, younger, had less years of education, were not married, had less household income, and resided in region 2 (Pierre) of South Dakota had higher prevalences of smoking before pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 11.3)

Mothers who smoked three months before pregnancy, compared to mothers who did not smoke three months before pregnancy, were significantly (*p*-value less than 0.05) *more likely* to report that:

- They were uninsured before pregnancy (24.6% vs. 9.2%).
- They used illicit drugs the 3 months before pregnancy (26.4% vs. 2.2%).
- They attended less than 80% of their prenatal visits (31.0% vs. 13.4%).
- They did not have their teeth cleaned during pregnancy (73.5% vs. 43.5%).
- They suffered emotional abuse during pregnancy (18.5% vs. 3.1%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (44.8% vs. 27.1%).
- They had a cesarean section delivery (30.8% vs. 22.2%).
- Their infant was born preterm (<37 weeks) (12.0% vs. 6.2%).
- They never breastfed their infant (16.6% vs. 5.7%).
- Their baby is exposed to smoke (5.1% vs. 1.9%; interpret these percentages with caution).
- They had a high ACE score (4+) (41.8% vs. 15.3%).
Figure 11.2: Percentage of mothers who smoked the three months before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.

- ** Statewide: 24.9%
- ** Race: White, Non-Hisp. 20.3%, Amer. Indian 52.9%, Other Races 11.9%
- ** Ethnicity: Hisp. 20.6%, Non-Hisp. 25.2%
- ** Age: <20 yrs 41.1%, 20-24 yrs 42.3%, 25-29 yrs 21.1%, 30-34 yrs 18.6%, >=35 yrs 19.3%
- ** Education: <12 yrs 42.2%, 12 yrs 41.8%, >12 yrs 15.0%
- ** Marital Status: Not Married 10.6%, Married 51.0%
- ** Annual Income: <$16K 49.5%, $16,001-$28K 50.2%, $28,001-$48K 20.4%, $48,001-$73K 15.3%, $73,001+ 6.7%
- ** Region: Sturgis 17.5%, Pierre 39.7%, Aberdeen 23.0%, Watertown 21.1%, Sioux Falls 16.4%, Mitchell 28.4%, Rapid City 39.3%

Healthy People 2020 (12%)
Figure 11.3: Risk behaviors and outcomes by mothers who smoked the three months before pregnancy, South Dakota, 2018 (weighted)

* p-value < 0.05     ** p-value < 0.01    p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
ACE = adverse childhood experiences
Smoked the Last Three Months of Pregnancy

Prevalence and Trends (Figure 11.4)

The percentage of South Dakota mothers who smoked the last three months of pregnancy has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 99% of women delivering a live birth not smoking prior to pregnancy (1% smoking prevalence) has not been achieved for any year.

Figure 11.4: Mothers who smoked the last three months of pregnancy by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 11.5)

- Overall prevalence of South Dakota mothers who smoked the last three months of pregnancy was 10.4%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with smoking the last three months of pregnancy included maternal race, education, marital status, and household income.
- Mothers who were American Indian, had less years of education, were not married, and had less household income had higher prevalences of smoking the last three months of pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 11.6)

Mothers who smoked during pregnancy, compared to mothers who did not smoke during pregnancy, were significantly (p-value less than 0.05) more likely to report that:

- They were uninsured before pregnancy (29.9% vs. 11.1%).
- They smoked the 3 months before pregnancy (99.7% vs. 16.1%).
- They used illicit drugs the 3 months before pregnancy (32.2% vs. 5.4%).
- They attended less than 80% of their prenatal visits (36.6% vs. 15.5%).
- They did not have their teeth cleaned during pregnancy (80.0% vs. 47.5%).
- They suffered emotional abuse during pregnancy (26.0% vs. 4.7%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (46.7% vs. 29.7%).
- They never breastfed their infant (19.6% vs. 7.1%).
- Their baby is exposed to smoke (9.9% vs. 1.9%; interpret these percentages with caution).
- They had a high ACE score (4+) (50.4% vs. 18.5%).

Mothers who smoked during pregnancy, compared to mothers who did not smoke during pregnancy, were significantly (p-value less than 0.05) less likely to report that:

- Their infant was high birth weight (>4000 grams) (2.4% vs. 10.4%; interpret these percentages with caution).
Figure 11.5: Percentage of mothers who smoked the last three months of pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

- ** Race:
  - White, Non-Hisp.: 8.7%
  - Amer. Indian: 21.9%
  - Other Races: 4.7%

- ** Ethnicity:
  - Hisp.^: 8.7%
  - Non-Hisp.: 10.6%

- ** Age:
  - <20 yrs^: 14.8%
  - 20-24 yrs: 16.5%
  - 25-29 yrs: 9.6%
  - 30-34 yrs: 7.2%
  - >=35 yrs^: 10.4%

- ** Education:
  - <12 yrs: 19.0%
  - 12 yrs: 19.0%
  - >12 yrs: 5.5%

- ** Marital Status:
  - Not Married: 4.6%
  - Married: 21.0%

- ** Annual Income:
  - <$16K: 22.6%
  - $16,001-$28K: 21.8%
  - $28,001-$48K: 9.1%
  - $48,001-$73K^: 6.0%
  - $73,001+: ^: 1.2%

- ** Region:
  - Sturgis^: 10.5%
  - Pierre: 17.4%
  - Aberdeen^: 10.9%
  - Watertown: 13.8%
  - Sioux Falls: 6.1%
  - Mitchell^: 7.9%
  - Rapid City: 13.3%

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

Healthy People 2020 (1%)
Figure 11.6: Risk behaviors and outcomes by mothers who smoked the last three months of pregnancy, South Dakota, 2018 (weighted)

- **Not Insured Before Preg.**
  - Did not smoke last three months of pregnancy: 11.1%
  - Smoked last three months of pregnancy: 29.9%

- **Smoke 3-Mo. Before Preg.**
  - Did not smoke last three months of pregnancy: 16.1%
  - Smoked last three months of pregnancy: 99.7%

- **Illicit Drugs 3-Mo. Before Preg.**
  - Did not smoke last three months of pregnancy: 5.4%
  - Smoked last three months of pregnancy: 32.2%

- **Attended <80% of PNC Visits**
  - Did not smoke last three months of pregnancy: 15.5%
  - Smoked last three months of pregnancy: 36.6%

- **Teeth Not Cleaned During Preg.**
  - Did not smoke last three months of pregnancy: 47.5%
  - Smoked last three months of pregnancy: 80.0%

- **Emotional Abuse During Pregnancy**
  - Did not smoke last three months of pregnancy: 4.7%
  - Smoked last three months of pregnancy: 26.0%

- **Diabetes, Hypertension, or Depression During Preg.**
  - Did not smoke last three months of pregnancy: 29.7%
  - Smoked last three months of pregnancy: 46.7%

- **High Birth Weight (>4000)**
  - Did not smoke last three months of pregnancy: 2.4%
  - Smoked last three months of pregnancy: 10.4%

- **Never Breast-Fed**
  - Did not smoke last three months of pregnancy: 7.1%
  - Smoked last three months of pregnancy: 19.6%

- **Baby Exposed to Smoke**
  - Did not smoke last three months of pregnancy: 1.9%
  - Smoked last three months of pregnancy: 9.9%

- **ACE Score 4+**
  - Did not smoke last three months of pregnancy: 18.5%
  - Smoked last three months of pregnancy: 50.4%

** p-value < 0.01  p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care; ACE = adverse childhood experiences
Use of E-cigarettes or Other Electronic Nicotine Products in the Last Two Years
Prevalence and Trends (Figure 11.7)

The percentage of South Dakota mothers who used e-cigarettes or other electronic nicotine products has not changed (p-value for linear trend greater than 0.05).

Figure 11.7: Mothers who used e-cigarettes or other electronic nicotine products in the last two years by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 11.8)

- Overall prevalence of South Dakota mothers who used e-cigarettes or other electronic nicotine products in the last two years was 6.2%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with using e-cigarettes in the last two years included age, education, marital status, and household income.
- Mothers who were younger, had less than a high school education, were not married, and had less household income had higher prevalences of using e-cigarettes or other electronic nicotine products in the last two years compared with their counterparts.

Risk Behaviors and Outcomes (Figure 11.9)

Mothers who used e-cigarettes or other electronic nicotine products in the last two years, compared to mothers who did not use e-cigarettes or other electronic nicotine products in the last two years, were significantly (p-value less than 0.05) more likely to report that:

- Their pregnancy was unintended (60.3% vs. 38.6%).
- They smoked the 3 months before pregnancy (79.2% vs. 21.3%).
- They used illicit drugs the 3 months before pregnancy (31.3% vs. 6.6%).
- They did not have their teeth cleaned during pregnancy (80.7% vs. 48.9%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (49.1% vs. 30.2%).
- Their infant was admitted to the NICU (19.8% vs. 7.6%; interpret these percentages with caution).
- They had a high ACE score (4+) (44.1% vs. 20.5%).
Figure 11.8: Percentage of mothers who used e-cigarettes or other electronic nicotine products in the last two years by demographic characteristics, South Dakota, 2018 (weighted)

<table>
<thead>
<tr>
<th>Race</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>White, Non-Hisp.</td>
<td>6.3</td>
</tr>
<tr>
<td>Amer. Indian</td>
<td>8.1</td>
</tr>
<tr>
<td>Other Races^</td>
<td>2.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hisp.^</td>
<td>5.9</td>
</tr>
<tr>
<td>Non-Hisp.</td>
<td>6.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20 yrs ^</td>
<td>18.1</td>
</tr>
<tr>
<td>20-24 yrs</td>
<td>13.0</td>
</tr>
<tr>
<td>25-29 yrs^</td>
<td>4.9</td>
</tr>
<tr>
<td>30-34 yrs^</td>
<td>3.3</td>
</tr>
<tr>
<td>&gt;=35 yrs^</td>
<td>2.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;12 yrs</td>
<td>13.5</td>
</tr>
<tr>
<td>12 yrs</td>
<td>8.3</td>
</tr>
<tr>
<td>&gt;12 yrs</td>
<td>3.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MaritalStatus</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Married</td>
<td>12.6</td>
</tr>
<tr>
<td>Married</td>
<td>2.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annual Income</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$16K</td>
<td>11.8</td>
</tr>
<tr>
<td>$16,001-$28K</td>
<td>13.7</td>
</tr>
<tr>
<td>$28,001-$48K</td>
<td>4.4</td>
</tr>
<tr>
<td>$48,001-$73K</td>
<td>2.3</td>
</tr>
<tr>
<td>$73,001+</td>
<td>2.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sturgis ^</td>
<td>0.5</td>
</tr>
<tr>
<td>Pierre ^</td>
<td>5.5</td>
</tr>
<tr>
<td>Aberdeen ^</td>
<td>15.4</td>
</tr>
<tr>
<td>Watertown ^</td>
<td>2.9</td>
</tr>
<tr>
<td>Sioux Falls</td>
<td>5.8</td>
</tr>
<tr>
<td>Mitchell</td>
<td></td>
</tr>
<tr>
<td>Rapid City</td>
<td>11.7</td>
</tr>
</tbody>
</table>

** p-value < 0.01 based on Rao-Scott chi-square test.
+ p-value < 0.01, ++ p-value < 0.01 based on logistic regression results for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
^\(^\) Chi-square test not calculated because of zero counts.
Figure 11.9: Risk behaviors and outcomes by mothers who used e-cigarettes or other electronic nicotine devices in the past two years, South Dakota, 2018 (weighted)

- Unintended or Mistimed Pregnancy*
  - Did not use e-cigarettes: 38.6%
  - Used e-cigarettes: 60.3%

- Smoke 3-Mo. Before Preg.**
  - Did not use e-cigarettes: 21.3%
  - Used e-cigarettes: 79.2%

- Illicit Drugs 3-Mo. Before Preg.**
  - Did not use e-cigarettes: 6.6%
  - Used e-cigarettes: 31.3%

- Teeth Not Cleaned During Preg.**
  - Did not use e-cigarettes: 48.9%
  - Used e-cigarettes: 80.7%

- Diabetes, Hypertension, or Depression During Preg.*
  - Did not use e-cigarettes: 30.2%
  - Used e-cigarettes: 49.1%

- NICU Admission***
  - Did not use e-cigarettes: 7.6%
  - Used e-cigarettes: 19.8%

- ACE Score 4+ **
  - Did not use e-cigarettes: 20.5%
  - Used e-cigarettes: 44.1%

* p-value < 0.05  ** p-value < 0.01  p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
NICU = neonatal intensive care unit, ACE = adverse childhood experiences

References


Chapter 12: Tobacco – quit status, relapse after pregnancy and barriers to quitting

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in smoking status during pregnancy</td>
<td></td>
</tr>
<tr>
<td>Non-smoker</td>
<td>75.2 (72.1-78.3, 8246)</td>
</tr>
<tr>
<td>Smoker who quit</td>
<td>14.4 (11.8-16.9, 1579)</td>
</tr>
<tr>
<td># Cigarettes reduced</td>
<td>6.2 (4.5-8.0, 685)</td>
</tr>
<tr>
<td># Cigarettes same or more</td>
<td>4.1 (2.6-5.7, 455)</td>
</tr>
<tr>
<td>Nonsmoker who resumed</td>
<td>0.0 (0.0-0.1, 4)^</td>
</tr>
</tbody>
</table>

Among mothers who smoked the three months before pregnancy,

| Quit status around the time of pregnancy | |
| Did not quit | 12.3 (6.7-17.9, 320) |
| Did not quit, but cut back | 25.1 (18.8-31.4, 652) |
| Yes, before they found out they were pregnant | 10.7 (5.8-15.5, 277) |
| Yes, when they found out they were pregnant | 42.2 (34.7-49.8, 1098) |
| Quit later in pregnancy | 9.7 (5.6-13.8, 253) |

| Barriers to quitting | |
| Cravings for a cigarette | 65.6 (58.4-72.9, 1683) |
| Loss of a way to handle stress | 58.1 (50.5-65.6, 1487) |
| Other people smoking around her | 55.7 (48.2-63.3, 1429) |
| Not wanting to quit | 42.3 (34.6-49.9, 1073) |
| Cost of medicines or products to help with quitting | 25.8 (18.8-32.9, 662) |
| Lack of support from others to quit | 24.8 (18.1-31.6, 637) |
| Fear of gaining weight | 18.6 (12.4-24.7, 475) |
| Cost of classes to help with quitting | 14.1 (8.9-19.4, 359) |

Relapse rate at the time of the survey among women who smoked before pregnancy and quit during pregnancy

46.2 (36.4-55.9, 723)

^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

PRAMS asked women who had smoked the 3 months before pregnancy:

Q30 In the 3 months before you got pregnant, how many cigarettes did you smoke on an average day? [List]
Q34 Did you quit smoking around the time of your most recent pregnancy? [List]
Q35 Listed below are some things that can make it hard for some people to quit smoking. For each item, check No if it is not something that might make it hard for you or Yes if it is. [List]
Q36 How many cigarettes do you smoke on an average day now? A pack has 20 cigarettes. [List]

Healthy People 2020 Objectives

- TU-6 Increase smoking cessation during pregnancy to 30%.
- MICH-19 Reduce postpartum relapse of smoking among women who quit smoking during pregnancy to 38%.
Relapse Rate
Prevalence and Trends (Figure 12.1)
The percentage of South Dakota mothers who quit smoking during pregnancy, but had restarted at the time of the survey (relapse rate) has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 38% has not been achieved in either year.

Figure 12.1: Mothers who quit smoking during pregnancy and had relapsed at the time the survey was completed by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 12.2)
- Among South Dakota mothers who smoked prior to pregnancy and quit during pregnancy, the relapse rate at the time the survey was completed (restarted smoking after pregnancy) was 46.2%.
- The only demographic characteristic that was significantly (p-value less than 0.05) associated with smoking relapse included maternal education.
- Mothers who were had less years of education had a higher prevalence of relapse compared with their counterparts.

Risk Behaviors and Outcomes by Mothers who Relapsed Postpartum (Figure 12.3)
Mothers who relapsed postpartum, compared to mothers who did not relapse postpartum, were significantly (p-value less than 0.05) more likely to report that:
- They used illicit drugs the 3 months before pregnancy (29.9% vs. 13.6%).
Figure 12.2: Percentage of mothers who quit smoking during pregnancy and had relapsed at the time the survey was completed by demographic characteristics, South Dakota, 2018 (weighted)

- Statewide: 46.2%
- Race:
  - White, Non-Hisp.: 44.5%
  - Amer. Indian: 47.0%
  - Other Races **
- Ethnicity:
  - Hisp. **
  - Non-Hisp.: 45.8%
- Age:
  - <20 yrs **
  - 20-24 yrs: 51.3%
  - 25-29 yrs: 48.8%
  - 30-34 yrs **
  - >=35 yrs **
- Education:
  - <12 yrs **
  - 12 yrs: 50.5%
  - >12 yrs: 30.6%
- Marital Status:
  - Not Married: 45.5%
  - Married: 47.9%
- Annual Income:
  - <$16K: 54.3%
  - $16,001-$28K **
  - $28,001-$48K **
  - $48,001-$73K **
  - $73,001+ **
- Region:
  - Sturgis **
  - Pierre **
  - Aberdeen **
  - Watertown **
  - Sioux Falls **
  - Mitchell **
  - Rapid City: 34.6%

* p-value < 0.05 based on Rao-Scott chi-square test.
** Suppressed since respondents in category were less than 35 (unweighted).

Healthy People 2020 (38%)
Figure 12.3: Risk behaviors and outcomes by mothers who quit smoking during pregnancy and had relapsed at the time the survey was completed, South Dakota, 2018 (weighted)

Illicit Drugs 3-Mo. Before Preg.*

Percent

Did not relapse postpartum
Relapsed postpartum

* p-value < 0.05
p-value based on Rao-Scott chi-square test
### Chapter 13: Environmental smoke exposure and actions of the health care provider

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Among women whose infant is alive, living with her and not in the hospital,</strong></td>
<td></td>
</tr>
<tr>
<td>Infant not around someone who smokes</td>
<td>97.4 (96.2-98.5, 10479)</td>
</tr>
<tr>
<td><strong>Among women who smoked in the 3 months before pregnancy,</strong></td>
<td></td>
</tr>
<tr>
<td>Was advised to quit smoking by a health care provider</td>
<td>76.4 (69.8-83.0, 2015)</td>
</tr>
<tr>
<td><strong>Actions of the health care provider:</strong></td>
<td></td>
</tr>
<tr>
<td>Spent time discussing how to quit smoking</td>
<td>42.9 (35.2-50.5, 1055)</td>
</tr>
<tr>
<td>Suggested attending a class or program to stop smoking</td>
<td>21.8 (15.5-28.2, 537)</td>
</tr>
<tr>
<td>Provided booklets, videos, or other materials to help quit smoking</td>
<td>35.0 (27.6-42.3, 862)</td>
</tr>
<tr>
<td>Referred to a national or state quit line</td>
<td>40.9 (33.2-48.6, 1004)</td>
</tr>
</tbody>
</table>

PRAMS asked women who had smoked the 3 months before pregnancy:

Q72 How many hours and minutes in the last week was your new baby in an enclosed space, such as a room or a vehicle, with someone who was smoking?

Q32 During any of your prenatal care visits, did a doctor, nurse, or other health care worker advise you to quit smoking?

Q33 Listed below are some things about quitting smoking that a doctor, nurse, or other health care worker might have done during any of your prenatal care visits. [List]

**Environmental Smoke Exposure – Infant**

**Prevalence and Trends (Figure 13.1)**

The percentage of South Dakota mothers who stated that their infant was not in an enclosed space with someone who smoked has not changed (p-value for linear trend greater than 0.05).

**Figure 13.1:** Mothers who stated that their infant was not in an enclosed space with someone who smoked by year, South Dakota, 2017–2018 (weighted)
Demographic Characteristics (Figure 13.2)
- Overall prevalence of South Dakota mothers who stated that their infant was not in an enclosed space with someone who smoked in the previous week was 97.4%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with the infant being in an enclosed space with someone who smoked included maternal race and education.
- Mothers who were of other races or white and had more years of education had the highest prevalence of their infant not being in an enclosed space with someone who smoked compared with their counterparts.

Risk Behaviors and Outcomes
Risk behaviors and outcomes are not given by whether the infant was exposed to environmental smoke since the category of infants with smoke exposure had less than 35 respondents.
Figure 13.2: Percentages of mothers who stated that their infant was not in an enclosed space with someone who smoked by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
+ p-value < 0.05 based on logistic regression results for linear trend.
Chapter 14: Alcohol use

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alcohol use</strong></td>
<td></td>
</tr>
<tr>
<td>Among all women, had any alcoholic drinks in the past 2 years</td>
<td>76.0 (73.1-78.8, 8296)</td>
</tr>
<tr>
<td>Among all women, had any alcoholic drinks the 3 months before pregnancy</td>
<td>67.1 (63.9-70.3, 7341)</td>
</tr>
<tr>
<td>Among all women, had any alcoholic drinks the last 3 months of pregnancy</td>
<td>8.2 (6.2-10.2, 913)</td>
</tr>
<tr>
<td><strong>Alcohol use before pregnancy</strong></td>
<td></td>
</tr>
<tr>
<td>Among women who drank in the past 2 years, amount drank the 3 months before pregnancy</td>
<td></td>
</tr>
<tr>
<td>Did not drink then</td>
<td>11.7 (9.1-14.4, 975)</td>
</tr>
<tr>
<td>Less than 1 drink a week</td>
<td>44.0 (39.8-48.2, 3659)</td>
</tr>
<tr>
<td>1 to 3 drinks a week</td>
<td>28.8 (25.0-32.6, 2396)</td>
</tr>
<tr>
<td>4 to 7 drinks a week</td>
<td>11.6 (8.9-14.3, 963)</td>
</tr>
<tr>
<td>8 or more drinks a week</td>
<td>3.9 (2.2-5.6, 323)</td>
</tr>
<tr>
<td><strong>Alcohol use during pregnancy</strong></td>
<td></td>
</tr>
<tr>
<td>Among women who drank in the past 2 years, amount drank the last 3 months of pregnancy</td>
<td></td>
</tr>
<tr>
<td>Did not drink then</td>
<td>89.2 (86.6-91.8, 7546)</td>
</tr>
<tr>
<td>Less than 1 drink a week</td>
<td>8.2 (5.9-10.6, 696)</td>
</tr>
<tr>
<td>1 or more drinks a week</td>
<td>2.6 (1.4-3.7, 217)</td>
</tr>
</tbody>
</table>

^Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

Significance

Alcohol consumption during pregnancy can have negative effects including Fetal Alcohol Syndrome (FAS) (1). FAS includes physical abnormalities, behavioral problems, learning disabilities, or below average head size, height, and weight. Since many pregnancies are unintended and often not known until late in the first trimester, it is important to reduce alcohol consumption in women of childbearing age who are at high risk of pregnancy.

PRAMS asked women:

Q40 Have you had any alcoholic drinks in the past 2 years?
Q41 During the 3 months before you got pregnant, how many alcoholic drinks did you have in an average week? [List]
Q42 During the 3 months before you got pregnant, how many times did you drink 4 alcoholic drinks or more in a 2-hour time span? [List]
Q43 During the last 3 months of your pregnancy, how many alcoholic drinks did you have in an average week? [List]

Healthy People 2020 Objectives

• MICH-11.1 Increase abstinence from alcohol among pregnant women to 98% (2% who drink alcohol).
• MICH-16.4 Increase the proportion of women delivering a live birth who did not drink alcohol prior to pregnancy to 56% (44% who drink alcohol).
Drinking the Three Months Before Pregnancy
Prevalence and Trends (Figure 14.1)
The percentage of South Dakota mothers who drank the three months before pregnancy has increased slightly between 2017 and 2018 (p-value for linear trend equal to 0.06). The Healthy People 2020 goal of 44% has not been achieved in any year.

Figure 14.1: Mothers who drank the three months before pregnancy by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 14.2)
- Overall prevalence of South Dakota mothers who drank the three months before pregnancy was 67.1%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with drinking the three months before pregnancy included maternal race, ethnicity, age, education, marital status, and household income.
- Mothers who were white, non-Hispanic, older, had more years of education, were married, and had greater household income had a higher prevalence of drinking alcohol the three months before pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 14.3)
Mothers who drank alcohol before pregnancy, compared to mothers who did not drink alcohol the three months before pregnancy, were significantly (p-value less than 0.05) more likely to report that:
- They used illicit drugs the three months before pregnancy (9.7% vs. 5.1%).
- Their infant was high birth weight (>4000 grams) (11.1% vs. 6.5%).
- Their infant does not sleep alone in the mother’s room (59.7% vs. 50.3%).

Mothers who drank alcohol before pregnancy, compared to mothers who did not drink alcohol the three months before pregnancy, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (10.4% vs. 18.0%).
- They started prenatal care after the first trimester or had no prenatal care (13.3% vs. 23.3%).
- They attended less than 80% of their prenatal visits (15.1% vs. 23.3%).
- They did not have their teeth cleaned during pregnancy (47.1% vs. 59.5%).
- They never breastfed their infant (6.5% vs. 12.1%).
Figure 14.2: Percentage of mothers who drank the three months before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.

Healthy People 2020 (56% abstinence - 44% who drink)
Figure 14.3:  Risk behaviors and outcomes by mothers drinking the three months before pregnancy, South Dakota, 2018 (weighted)

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Did not drink 3 months before pregnancy</th>
<th>Drank 3 months before pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Insured Before Preg.**</td>
<td>18.0</td>
<td>10.4</td>
</tr>
<tr>
<td>Illicit Drugs 3-Mo. Before Preg.**</td>
<td>5.1</td>
<td>9.7</td>
</tr>
<tr>
<td>Delayed or No PNC **</td>
<td>23.3</td>
<td>13.3</td>
</tr>
<tr>
<td>Attended &lt;80% of PNC Visits**</td>
<td>23.3</td>
<td>15.1</td>
</tr>
<tr>
<td>Teeth Not Cleaned During Preg.**</td>
<td>59.5</td>
<td>47.1</td>
</tr>
<tr>
<td>High Birth Weight (&gt;4000)*</td>
<td>6.5</td>
<td>11.1</td>
</tr>
<tr>
<td>Never Breast-Fed *</td>
<td>12.1</td>
<td>6.5</td>
</tr>
<tr>
<td>Does Not Sleep Alone in Room w/Mother*</td>
<td>50.3</td>
<td>59.7</td>
</tr>
</tbody>
</table>

* p-value < 0.05   ** p-value < 0.01  

p-value based on Rao-Scott chi-square test.  
PNC = prenatal care
Drinking the Last Three Months of Pregnancy
Prevalence and Trends (Figure 14.4)
The percentage of South Dakota mothers who drank the last three months of pregnancy has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 2% has not been achieved in any year.

Figure 14.4: Mothers who drank the last three months of pregnancy by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 14.5)
- Overall prevalence of South Dakota mothers who drank the last three months of pregnancy was 8.2%.
- No demographic characteristics were associated with drinking the last three months of pregnancy.

Risk Behaviors and Outcomes (Figure 14.6)
Mothers who drank alcohol during pregnancy, compared to mothers who did not drink alcohol during pregnancy, were significantly (p-value less than 0.05) more likely to report that:
- They drank before pregnancy (100% vs. 64.2%)
- They started prenatal care after the first trimester or had no prenatal care (27.7% vs. 15.7%).
Figure 14.5:  Percentage of mother who drank during pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

Healthy People 2020 (98% abstinence - 2% who drink)
Figure 14.6: Risk behaviors and outcomes by mothers who drank during pregnancy, South Dakota, 2018 (weighted)

* p-value < 0.05; p-value based on Rao-Scott chi-square test.

References

## Chapter 15: Drug Use

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>**Drug use before pregnancy *</td>
<td></td>
</tr>
<tr>
<td>Over-the-counter pain relievers (aspirin, Tylenol®, etc.)</td>
<td>69.0 (65.8-72.3, 7620)</td>
</tr>
<tr>
<td>Prescription pain relievers (hydrocodone, oxycodone, etc.)</td>
<td>3.3 (2.3-4.4, 370)</td>
</tr>
<tr>
<td>Adderall®, Ritalin®, or another stimulant</td>
<td>1.9 (0.8-3.1, 215)</td>
</tr>
<tr>
<td>Marijuana or hash</td>
<td>8.1 (6.2-9.9, 890)</td>
</tr>
<tr>
<td>Amphetamines (speed, crystal meth, ice, etc.)</td>
<td>1.5 (0.9-2.1, 165)</td>
</tr>
<tr>
<td>Any illicit drugs#</td>
<td>8.6 (6.8-10.5, 953)</td>
</tr>
<tr>
<td>**Drug use during pregnancy *</td>
<td></td>
</tr>
<tr>
<td>Over-the-counter pain relievers (aspirin, Tylenol®, etc.)</td>
<td>65.4 (62.0-68.7, 7235)</td>
</tr>
<tr>
<td>Prescription pain relievers (hydrocodone, oxycodone, etc.)</td>
<td>3.5 (2.3-4.7, 386)</td>
</tr>
<tr>
<td>Marijuana or hash</td>
<td>4.9 (3.5-6.4, 544)</td>
</tr>
<tr>
<td>Amphetamines (speed, crystal meth, ice, etc.)</td>
<td>1.6 (0.8-2.4, 176)</td>
</tr>
<tr>
<td>Any illicit drugs#</td>
<td>5.1 (3.6-6.6, 565)</td>
</tr>
</tbody>
</table>

* Drugs also asked about but not listed either before or during pregnancy, or both, include synthetic marijuana; methadone, naloxone, subutex, or Suboxone®, heroin; cocaine; tranquilizers; hallucinogens and huffing (see full list below). The prevalence rates for these drugs were less than 1% and are not shown.

# Illicit drug use includes marijuana, synthetic marijuana, methadone, heroin, amphetamines, cocaine, tranquilizers, hallucinogens, or sniffing gasoline, glue, etc. to get high.

### Significance

Illicit drug use during pregnancy leads to increased risks of adverse outcomes to the pregnant mother as well as the developing fetus. Illicit substances may cause drug dependence and addiction for the newborns, and they may exhibit withdrawal symptoms or neonatal abstinence syndrome (1,2). Drugs like marijuana or cocaine exhibit problems like growth defects, behavior problems, increased risk for miscarriage or still birth, heart problems, and preterm labor (2). Recommendations for use of over-the-counter medications are available (3) and it should be noted that not all are considered safe and the risks and benefits of each medication should be considered.

### PRAMS asked women:

| Q68 During the month before you got pregnant, did you take or use any of the following drugs for any reason? [List] |
| Q71 During your most recent pregnancy, did you take or use any of the following drugs for any reason? [List]     |

**List of drugs included:** Over-the-counter pain relievers such as aspirin, Tylenol®, Advil®, or Aleve®; prescription pain relievers such as hydrocodone (Vicodin®), oxycodone (Percocet®), or codeine; Adderall®, Ritalin®, or another stimulant; marijuana or hash; synthetic marijuana (K2, Spice); methadone, naloxone, subutex, or Suboxone®; heroin (smack, junk, black tar, Chiva); amphetamines (uppers, speed, crystal meth, crank, ice, agua); cocaine (crack, rick, coke, blow, snow, nieve); tranquilizers (downers, ludes); hallucinogens (LSD/acid, PCP/angel dust, Ecstasy, Molly, mushrooms, bath salts); and sniffing gasoline, glue, aerosol spray cans, or paint to get high (huffing).

### Healthy People 2020 Objective

- **MICH-11.4** Increase abstinence from illicit drugs among pregnant women to 100% (0% for illicit drug use).
Illicit Drug Use Before Pregnancy
Prevalence and Trends (Figure 15.1)
The percentage of South Dakota mothers who used any illicit drugs before pregnancy has not changed (p-value for linear trend greater than 0.05).

Figure 15.1: Mothers who used any illicit drugs before pregnancy by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 15.2)
- Overall prevalence of South Dakota mothers who used any illicit drugs before pregnancy was 8.6%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with using illicit drugs before pregnancy included maternal race, age, education, marital status, household income, and region of the state the mother resided.
- Mothers who were American Indian, younger (20-24 years of age), had less years of education, were not married, and had less household income had a higher prevalence of using illicit drugs before pregnancy compared to their counterparts. Mothers who resided in the Pierre and Rapid City regions had the higher proportion of mothers who used illicit drugs before pregnancy.

Risk Behaviors and Outcomes (Figure 15.3)
Mothers with any illicit drug use before pregnancy, compared to mothers who did not have illicit drug use before pregnancy, were significantly (p-value less than 0.05) more likely to report that:
- They were uninsured before pregnancy (33.9% vs. 11.4%).
- They smoked the 3 months before pregnancy (79.8% vs. 19.9%).
- They drank alcohol the 3 months before pregnancy (79.7% vs. 66.2%).
- They started prenatal care after the first trimester or had no prenatal care (32.4% vs. 15.2%).
- They attended less than 80% of their prenatal visits (28.8% vs. 16.4%).
- They did not have their teeth cleaned during pregnancy (77.0% vs. 48.8%).
- They suffered emotional abuse during pregnancy (27.8% vs. 5.0%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (42.9% vs. 30.5%).
- Their infant was low birth weight (<2500 grams) (9.9% vs. 4.3%).
- Their infant was born preterm (<37 weeks) (14.4% vs. 6.8%).
- They never breastfed their infant (20.7% vs. 7.2%).
- Their infant does not sleep alone in the mother’s room (73.7% vs. 55.2%).
- They had a high ACE score (4+) (47.1% vs. 19.8%).
Figure 15.2: Percentage of mothers who used any illicit drug the month before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
+ p-value < 0.05, ++ p-value < 0.01 based on logistic regression results for linear trend.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
Figure 15.3: Risk behaviors and outcomes by mothers who used illicit drugs the month before pregnancy, South Dakota, 2018 (weighted)

- Not Insured Before Preg.**
  - No illicit drug use before pregnancy: 11.4%
  - Illicit drug use before pregnancy: 33.9%

- Smoke 3-Mo. Before Preg.**
  - No illicit drug use before pregnancy: 19.9%
  - Illicit drug use before pregnancy: 79.8%

- Alcohol 3-Mo. Before Preg.**
  - No illicit drug use before pregnancy: 66.2%
  - Illicit drug use before pregnancy: 79.7%

- Delayed or No PNC **
  - No illicit drug use before pregnancy: 15.2%
  - Illicit drug use before pregnancy: 32.4%

- Attended <80% of PNC Visits**
  - No illicit drug use before pregnancy: 16.4%
  - Illicit drug use before pregnancy: 28.8%

- Teeth Not Cleaned During Preg.**
  - No illicit drug use before pregnancy: 48.8%
  - Illicit drug use before pregnancy: 77.0%

- Emotional Abuse During Pregnancy**
  - No illicit drug use before pregnancy: 5.0%
  - Illicit drug use before pregnancy: 27.8%

- Diabetes, Hypertension, or Depression During Preg.*
  - No illicit drug use before pregnancy: 30.5%
  - Illicit drug use before pregnancy: 42.9%

- Low Birth Weight (<2500)*
  - No illicit drug use before pregnancy: 4.3%
  - Illicit drug use before pregnancy: 9.9%

- Preterm Birth*
  - No illicit drug use before pregnancy: 6.8%
  - Illicit drug use before pregnancy: 14.4%

- Never Breast-Fed **
  - No illicit drug use before pregnancy: 7.2%
  - Illicit drug use before pregnancy: 20.7%

- Does Not Sleep Alone in Room w/Mother**
  - No illicit drug use before pregnancy: 55.2%
  - Illicit drug use before pregnancy: 73.7%

- ACE Score 4+ **
  - No illicit drug use before pregnancy: 19.8%
  - Illicit drug use before pregnancy: 47.1%

* p-value < 0.05   ** p-value < 0.01   p-value based on Rao-Scott chi-square test.
PNC = prenatal care; ACE = adverse childhood experiences
Illicit Drug Use During Pregnancy
Prevalence and Trends (Figure 15.4)
The percentage of South Dakota mothers who used any illicit drugs during pregnancy increased slightly between 2017 and 2018 (p-value for linear trend equal to 0.06).

Figure 15.4: Mothers who used any illicit drugs during pregnancy by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 15.5)
- Overall prevalence of South Dakota mothers who used any illicit drugs during pregnancy was 5.1%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with using illicit drugs during pregnancy included maternal race, marital status, household income, and region of the state the mother resided.
- Mothers who were American Indian, were not married, and had less household income had a higher prevalence of using illicit drugs during pregnancy compared to their counterparts.
- Mothers who resided in the Pierre region had the highest proportion of mothers who used illicit drugs during pregnancy.

Risk Behaviors and Outcomes (Figure 15.6)
Mothers with any illicit drug use during pregnancy, compared to mothers who did not have illicit drug use before pregnancy, were significantly (p-value less than 0.05) more likely to report that:
- They were uninsured before pregnancy (27.0% vs. 12.5%).
- They smoked the 3 months before pregnancy (75.2% vs. 22.5%).
- The used illicit drugs the 3 months before pregnancy (88.6% vs. 4.2%).
- They started prenatal care after the first trimester or had no prenatal care (34.4% vs. 15.6%).
- They attended less than 80% of their prenatal visits (46.8% vs. 16.0%).
- They did not have their teeth cleaned during pregnancy (74.2% vs. 50.3%).
- They suffered emotional abuse during pregnancy (39.8% vs. 5.2%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (56.2% vs. 30.4%).
- Their infant was born preterm (<37 weeks) (18.5% vs. 6.9%; interpret these percentages with caution).
- They never breastfed their infant (26.7% vs. 7.2%).
- They had a high ACE score (4+) (50.7% vs. 20.8%).
Figure 15.5: Percentage of mothers who used any illicit drug during pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

- Statewide: 5.1%
- Race:
  - White, Non-Hisp.: 3.3%
  - Amer. Indian: 14.1%
  - Other Races: 3.2%
- Ethnicity:
  - Hisp.: 3.4%
  - Non-Hisp.: 5.1%
- Age:
  - <20 yrs: 5.6%
  - 20-24 yrs: 7.7%
  - 25-29 yrs: 3.3%
  - 30-34 yrs: 4.5%
  - >=35 yrs: 8.2%
- Education:
  - <12 yrs: 8.3%
  - 12 yrs: 6.1%
  - >12 yrs: 4.0%
- Marital Status:
  - Not Married: 1.9%
  - Married: 11.0%
- Annual Income:
  - <$16K: 12.4%
  - $16,001-$28K: 11.0%
  - $28,001-$48K: 4.0%
  - $48,001-$73K: 0.2%
  - $73,001+: 2.2%
- Region:
  - Sturgis: 6.5%
  - Pierre: 12.8%
  - Aberdeen: 2.1%
  - Watertown: 2.1%
  - Sioux Falls: 4.8%
  - Mitchell: 5.4%
  - Rapid City: 5.3%

* p-value < 0.05, ** p-value < 0.01 based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

Healthy People 2020 (100% abstinence - 0% who use illicit drugs)
Figure 15.6: Risk behaviors and outcomes by mothers who used any illicit drugs during pregnancy, South Dakota, 2018 (weighted)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>No illicit drug use during pregnancy</th>
<th>Illicit drug use during pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Insured Before Preg. *</td>
<td>12.5</td>
<td>27.0</td>
</tr>
<tr>
<td>Smoke 3-Mo. Before Preg. **</td>
<td>22.5</td>
<td>75.2</td>
</tr>
<tr>
<td>Illicit Drugs 3-Mo. Before Preg. **</td>
<td>4.2</td>
<td>88.6</td>
</tr>
<tr>
<td>Delayed or No PNC **</td>
<td>15.6</td>
<td>34.4</td>
</tr>
<tr>
<td>Attended &lt;80% of PNC Visits **</td>
<td>16.0</td>
<td>46.8</td>
</tr>
<tr>
<td>Teeth Not Cleaned During Preg. **</td>
<td>50.3</td>
<td>74.2</td>
</tr>
<tr>
<td>Emotional Abuse During Pregnancy **</td>
<td>5.2</td>
<td>39.8</td>
</tr>
<tr>
<td>Diabetes, Hypertension, or Depression During Preg. **</td>
<td>30.4</td>
<td>56.2</td>
</tr>
<tr>
<td>Preterm Birth **</td>
<td>6.9</td>
<td>18.5</td>
</tr>
<tr>
<td>Never Breast-Fed **</td>
<td>7.2</td>
<td>26.7</td>
</tr>
<tr>
<td>ACE Score 4+ **</td>
<td>20.8</td>
<td>50.7</td>
</tr>
</tbody>
</table>

* p-value < 0.05  ** p-value < 0.01  p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care; ACE = adverse childhood experiences
References


Chapter 16: Breastfeeding

Measure % of women (95% CI, N)

Women’s breastfeeding practices with this infant *

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever breastfed or pumped breastmilk</td>
<td>91.7 (89.8-93.6, 10068)</td>
</tr>
<tr>
<td>Breastfed or pumped breastmilk at least 2 months</td>
<td>75.7 (72.7-78.7, 8292)</td>
</tr>
</tbody>
</table>

Sources of helpful information about breastfeeding

<table>
<thead>
<tr>
<th>Source</th>
<th>% of women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s doctor</td>
<td>83.5 (80.8-86.2, 9069)</td>
</tr>
<tr>
<td>A nurse, midwife, or doula</td>
<td>76.9 (73.8-80.1, 8214)</td>
</tr>
<tr>
<td>Baby’s doctor or health care provider</td>
<td>73.2 (69.9-76.5, 7815)</td>
</tr>
<tr>
<td>Family or friends</td>
<td>70.2 (66.8-73.6, 7505)</td>
</tr>
<tr>
<td>A breastfeeding or lactation specialist</td>
<td>68.8 (65.4-72.2, 7314)</td>
</tr>
<tr>
<td>A breastfeeding support group</td>
<td>22.5 (19.5-25.5, 2360)</td>
</tr>
<tr>
<td>A breastfeeding hotline or toll-free number</td>
<td>11.5 (9.2-13.7, 1201)</td>
</tr>
</tbody>
</table>

Among women who breastfed even for a short time but currently are not breast-feeding, reasons for stopping *

<table>
<thead>
<tr>
<th>Reason</th>
<th>% of women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thought she was not producing enough milk, or milk dried up</td>
<td>53.2 (46.7-59.6, 1748)</td>
</tr>
<tr>
<td>Breast milk alone did not satisfy baby</td>
<td>32.8 (26.7-38.8, 1074)</td>
</tr>
<tr>
<td>Baby had difficulty latching or nursing</td>
<td>28.2 (22.4-34.1, 927)</td>
</tr>
<tr>
<td>Went back to work</td>
<td>27.8 (21.8-33.7, 912)</td>
</tr>
<tr>
<td>Nipples were sore, cracked, or bleeding or it was too painful</td>
<td>26.4 (20.4-32.4, 868)</td>
</tr>
<tr>
<td>Had too many other household duties</td>
<td>18.3 (13.3-23.4, 603)</td>
</tr>
<tr>
<td>Felt it was the right time to stop breastfeeding</td>
<td>13.2 (9.0-17.4, 433)</td>
</tr>
<tr>
<td>Thought baby was not gaining enough weight</td>
<td>11.3 (7.4-15.2, 371)</td>
</tr>
<tr>
<td>Baby was jaundiced (yellowing of the skin or whites of the eyes)</td>
<td>6.7 (3.8-9.7, 222)</td>
</tr>
<tr>
<td>Got sick or had to stop for medical reasons</td>
<td>5.7 (2.7-8.7, 188)</td>
</tr>
<tr>
<td>Went back to school</td>
<td>3.2 (0.8-5.6, 105)</td>
</tr>
<tr>
<td>Partner did not support breastfeeding</td>
<td>0.6 (0.0-1.6, 21)</td>
</tr>
</tbody>
</table>

* Among mothers whose infants were alive, had been discharged from the hospital, and were living them at the time of the survey.

^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

Significance

Breastfeeding is considered to be the best method for infant feeding. According to the American Academy of Pediatrics 2012 Policy Statement, breastfeeding is stated to be a “public health issue and not only a lifestyle choice” (1). Recommendations given by the Centers for Disease Control and Prevention (CDC) state that a new mother should exclusively breastfeed for six months with continued breastfeeding for up to one year, while other foods are being introduced. Breastfeeding may continue as long as the mother desires. There are numerous benefits to breastfeeding including decreasing postpartum blood loss through increased uterine contractions. Long-term benefits for the mother may include lower risk of diabetes, ovarian cancer, and certain types of breast cancer (1). Benefits to the infant include receiving a large variety of antibodies that are in breast milk that may help infants fight off viral and bacterial infections. Additionally, human milk provides the precise amounts of proteins, carbohydrates, fats, minerals, and vitamins that are needed for optimal health, with the exception of vitamins D and K. Long-term benefits of breastfeeding for the infant may include a reduced risk of developing obesity, type 2 diabetes, infections, atopic dermatitis, and asthma later in life (1-3).

PRAMS asked women:

Q51 Before or after your new baby was born, did you receive information about breastfeeding from any of the following sources? [List]
Q52 Did you ever breastfeed or pump breast milk to feed your new baby, even for a short period of time?
Q53 Are you currently breastfeeding or feeding pumped milk to your new baby?
Q54 How many weeks or months did you breastfeed or feed pumped milk to your baby?
Q55 What were your reasons for stopping breastfeeding? [List]

Healthy People 2020 Objectives
- MICH-21.1 Increase the proportion of infants who are ever breastfed to 82%.

Ever Breastfed or Pumped Milk
Prevalence and Trends (Figure 16.1)
The percentage of South Dakota mothers who ever breastfed or pumped milk at any time has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 82% has been achieved for all years.

Figure 16.1: Mothers who ever breastfed by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 16.2)
- Overall prevalence of South Dakota mothers who ever breastfed was 91.7%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with ever breastfeeding included maternal race, education, marital status and household income.
- Mothers who were white, had more years of education, were married, and had greater household income had a higher prevalence of ever breastfeeding compared with their counterparts.

Risk Behaviors and Outcomes (Figure 16.3)
Mothers who ever breastfed, compared to mothers who did not ever breastfeed, were significantly (p-value less than 0.05) more likely to report that:
- They drank alcohol the 3 months before pregnancy (68.3% vs. 52.1%).

Mothers who ever breastfed, compared to mothers who did not ever breastfeed, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (11.8% vs. 28.4%).
- They smoked the 3 months before pregnancy (22.2% vs. 48.5%).
- The used illicit drugs the month before pregnancy (7.1% vs. 20.5%).
- They started prenatal care after the first trimester or had no prenatal care (14.4% vs. 34.8%).
- They attended less than 80% of their prenatal visits (15.9% vs. 29.4%).
- They did not have their teeth cleaned during pregnancy (48.8% vs. 74.6%).
- Their baby is exposed to smoke (1.9% vs. 10.4%; interpret these percentages with caution).
Figure 16.2: Percentage of mothers who ever breastfed or pumped breastmilk by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.

Healthy People 2020 (82%)
Breastfeeding at Two Months
Prevalence and Trends (Figure 16.4)
The percentage of South Dakota mothers who breastfed at least two months has not changed (p-value for linear trend greater than 0.05).
Figure 16.4: Mothers who breastfed at least two months by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 16.5)
- Overall prevalence of South Dakota mothers who breastfed at least two months was 75.7%.
- Characteristics significantly (p-value less than 0.05) associated with breastfeeding for at least two months included maternal race, ethnicity, age, education, marital status, household income, and region of the state the mother resided.
- Mothers who were white, non-Hispanic, older, had more years of education, were married, and had greater household income had a higher prevalence of breastfeeding at least two months postpartum compared with their counterparts. Mothers residing in Sioux Falls or Watertown regions had the highest rate of breastfeeding at least two months.

Risk Behaviors and Outcomes (Figure 16.6)
Mothers who breastfed at least two months, compared to mothers who did not breastfeed at least two months, were significantly (p-value less than 0.05) more likely to report that:
- They drank alcohol the 3 months before pregnancy (71.4% vs. 53.6%).

Mothers who breastfed at 2 months, compared to mothers who did not breastfeed at least two months, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (10.6% vs. 21.7%).
- They smoked the 3 months before pregnancy (18.9% vs. 41.7%).
- They used illicit drugs the 3 months before pregnancy (6.6% vs. 13.4%).
- They were obese prior to pregnancy (18.9% vs. 37.1%).
- They started prenatal care after the first trimester or had no prenatal care (14.2% vs. 21.1%).
- They attended less than 80% of their prenatal visits (14.0% vs. 26.3%).
- They did not have their teeth cleaned during pregnancy (44.9% vs. 70.0%).
- They suffered emotional abuse during pregnancy (4.5% vs. 13.1%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (28.1% vs. 42.0%).
- Their infant was admitted to the NICU (7.0% vs. 12.2%).
- Their baby is exposed to smoke (1.8% vs. 5.4%; interpret these percentages with caution).
- They had a high ACE score (4+) (20.0% vs. 29.3%).
Figure 16.5: Percentage of mothers who breastfed or pumped breastmilk at least two months by demographic characteristics, South Dakota, 2018 (weighted)

* p-value < 0.05, ** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.
Figure 16.6: Risk behaviors and outcomes by mothers who breastfed at least two months, South Dakota, 2018 (weighted)

- **Not Insured Before Preg.**
  - Breastfed at 2 months: 10.6%
  - Not breastfeeding at 2 months: 21.7%

- **Smoke 3-Mo. Before Preg.**
  - Breastfed at 2 months: 18.9%
  - Not breastfeeding at 2 months: 41.7%

- **Alcohol 3-Mo. Before Preg.**
  - Breastfed at 2 months: 53.6%
  - Not breastfeeding at 2 months: 71.4%

- **Illicit Drugs 3-Mo. Before Preg.**
  - Breastfed at 2 months: 6.6%
  - Not breastfeeding at 2 months: 13.4%

- **Maternal Obesity Before Preg.**
  - Breastfed at 2 months: 18.9%
  - Not breastfeeding at 2 months: 37.1%

- **Delayed or No PNC**
  - Breastfed at 2 months: 14.2%
  - Not breastfeeding at 2 months: 21.1%

- **Attended <80% of PNC Visits**
  - Breastfed at 2 months: 14.0%
  - Not breastfeeding at 2 months: 26.3%

- **Teeth Not Cleaned During Preg.**
  - Breastfed at 2 months: 44.9%
  - Not breastfeeding at 2 months: 70.0%

- **Emotional Abuse During Pregnancy**
  - Breastfed at 2 months: 4.5%
  - Not breastfeeding at 2 months: 13.1%

- **Diabetes, Hypertension, or Depression During Preg.**
  - Breastfed at 2 months: 28.1%
  - Not breastfeeding at 2 months: 42.0%

- **NICU Admission**
  - Breastfed at 2 months: 7.0%
  - Not breastfeeding at 2 months: 12.2%

- **Baby Exposed to Smoke**
  - Breastfed at 2 months: 1.8%
  - Not breastfeeding at 2 months: 5.4%

- **ACE Score 4+**
  - Breastfed at 2 months: 20.0%
  - Not breastfeeding at 2 months: 29.3%

* p-value < 0.05  ** p-value < 0.01  p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care, NICU = neonatal intensive care unit, ACE = adverse childhood experiences
References


Chapter 17: Infant health

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length of infant hospital stay, all infants</strong></td>
<td></td>
</tr>
<tr>
<td>Less than 1 day</td>
<td>2.1 (1.1-3.1, 232)</td>
</tr>
<tr>
<td>1-2 days</td>
<td>64.9 (61.5-68.3, 7185)</td>
</tr>
<tr>
<td>3-5 days</td>
<td>25.1 (22.0-28.2, 2782)</td>
</tr>
<tr>
<td>6-14 days</td>
<td>4.2 (2.8-5.6, 466)</td>
</tr>
<tr>
<td>More than 14 days</td>
<td>2.6 (1.5-3.6, 283)</td>
</tr>
<tr>
<td>Not born in hospital</td>
<td>0.9 (0.2-1.5, 96)^</td>
</tr>
<tr>
<td>Still in hospital</td>
<td>0.3 (0.0-0.7, 34)^</td>
</tr>
<tr>
<td><strong>Infant health after delivery</strong></td>
<td></td>
</tr>
<tr>
<td><em>Among mothers of all infants</em></td>
<td></td>
</tr>
<tr>
<td>Infants who were born preterm (less than 37 weeks)</td>
<td>7.5 (5.7-9.3, 842)</td>
</tr>
<tr>
<td>Infants who were low birth weight (less than 2500 grams)</td>
<td>4.9 (3.5-6.3, 546)</td>
</tr>
<tr>
<td><em>Among mothers with singletons only</em></td>
<td></td>
</tr>
<tr>
<td>Infants who were born preterm (less than 37 weeks)</td>
<td>6.1 (4.5-7.7, 669)</td>
</tr>
<tr>
<td>Infants who were low birth weight (less than 2500 grams)</td>
<td>3.4 (2.2-4.5, 369)</td>
</tr>
<tr>
<td><strong>Singleton infants with gestational age</strong></td>
<td></td>
</tr>
<tr>
<td>Less than 28 weeks (extremely preterm)</td>
<td>0.1 (0.0-0.3, 15)^</td>
</tr>
<tr>
<td>28-33 weeks (moderately preterm)</td>
<td>0.7 (0.2-1.1, 72)^</td>
</tr>
<tr>
<td>34-36 week (late preterm)</td>
<td>5.3 (3.7-6.9, 582)</td>
</tr>
<tr>
<td>37-44 weeks (term or post-term)</td>
<td>93.9 (92.3-95.5, 10284)</td>
</tr>
<tr>
<td><strong>Singleton infants with birth weight (g)</strong></td>
<td></td>
</tr>
<tr>
<td>250-1449 (very low birth weight, VLBW)</td>
<td>0.2 (0.0-0.5, 27)^</td>
</tr>
<tr>
<td>1500-2499 (low birth weight, LBW)</td>
<td>3.1 (2.0-4.2, 342)</td>
</tr>
<tr>
<td>2500-4000 (normal birth weight)</td>
<td>86.7 (84.4-89.1, 9505)</td>
</tr>
<tr>
<td>Over 4000 (high birth weight)</td>
<td>9.9 (7.8-12.0, 1086)</td>
</tr>
</tbody>
</table>

^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

Significance
Preterm birth, defined as a birth at less than 37 completed weeks of gestation, is the single most important cause of perinatal morbidity and mortality in industrialized countries (1). It has been estimated that 60 to 80% of deaths among infants without congenital anomalies are related to preterm births (2). In addition, preterm birth has long-term health implications, such as increased risk of cerebral palsy, cognitive impairment, deafness, and blindness. The majority of preterm births follow spontaneous rupture of membranes or onset of labor or both. The reason for preterm labor is not clear although it appears that both genetic and environmental factors are important. Environmental risk factors that have been identified for preterm birth include infection, low socioeconomic status, and smoking.

PRAMS asked women:
Q47 When was your baby born?
Q48 After your baby was delivered, how long did he or she stay in the hospital? [List]

Healthy People 2020 Objectives
- MICH-8.1 Reduce low birth weight births to 7.8%
- MICH-8.2 Reduce very low birth weight births to 1.2%
- MICH-9.1 Reduce overall preterm births to 9.4%
- MICH-9.2 Reduce live births at 34 to 36 weeks of gestation to 6.8%
- MICH-9.3 Reduce live births at 32 to 33 weeks of gestation to 1.1%
- MICH-9.4 Reduce very preterm or live births at less than 32 weeks of gestation to 1.5%
Definition
A singleton is an offspring (baby) born singly, as distinguished from twins.

Preterm Birth (singletons only)
Prevalence and Trends (Figure 17.1)
The percentage of South Dakota mothers who had a singleton preterm birth has not changed (p-value for linear trend greater than 0.05).

Figure 17.1: Mothers who had a singleton preterm birth by year, South Dakota, 2017–2018 (weighted)

Demographic Characteristics (Figure 17.2)
- Overall prevalence of South Dakota mothers who had a singleton preterm birth was 6.1%.
- The demographic characteristic that were significantly (p-value less than 0.05) associated with having a singleton preterm birth were race, ethnicity, education and household income.
- Mothers who were white, non-Hispanic, more years of education, and greater household income had a lower prevalence of a singleton preterm birth compared with their counterparts.

Risk Behaviors and Outcomes (Figure 17.3)
Mothers who had a singleton preterm birth, compared to mothers who did not have a preterm birth, were significantly (p-value less than 0.05) more likely to report that:
- They smoked the 3 months before pregnancy (40.4% vs. 23.8%).
- They used illicit drugs the 3 months before pregnancy (18.0% vs. 8.0%).
- They suffered emotional abuse during pregnancy (13.0% vs. 6.5%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (51.2% vs. 30.2%).
- They had a cesarean section delivery (42.9% vs. 22.4%).
- Their infant was low birth weight (<2500 grams) (34.4% vs. 1.4%).
- Their infant was admitted to the NICU (52.2% vs. 4.9%).
Figure 17.2: Percentage of mothers with a singleton infant who was born premature by demographic characteristics, South Dakota, 2018 (weighted)

<table>
<thead>
<tr>
<th>Category</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race</strong></td>
<td></td>
</tr>
<tr>
<td>White, Non-Hisp.</td>
<td>4.3</td>
</tr>
<tr>
<td>Amer. Indian</td>
<td>11.3</td>
</tr>
<tr>
<td>Other Races</td>
<td>9.5</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>Hisp.</td>
<td>10.8</td>
</tr>
<tr>
<td>Non-Hisp.</td>
<td>5.8</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;20 yrs&lt;sup&gt;^&lt;/sup&gt;</td>
<td>11.3</td>
</tr>
<tr>
<td>20-24 yrs</td>
<td>8.2</td>
</tr>
<tr>
<td>25-29 yrs</td>
<td>4.4</td>
</tr>
<tr>
<td>30-34 yrs</td>
<td>5.9</td>
</tr>
<tr>
<td>&gt;=35 yrs&lt;sup&gt;^&lt;/sup&gt;</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;12 yrs</td>
<td>10.2</td>
</tr>
<tr>
<td>12 yrs</td>
<td>9.8</td>
</tr>
<tr>
<td>&gt;12 yrs</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
</tr>
<tr>
<td>Not Married</td>
<td>7.9</td>
</tr>
<tr>
<td>Married</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Annual Income</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;$16K</td>
<td>11.6</td>
</tr>
<tr>
<td>$16,001-$28K&lt;sup&gt;^&lt;/sup&gt;  </td>
<td>6.1</td>
</tr>
<tr>
<td>$28,001-$48K&lt;sup&gt;^&lt;/sup&gt;  </td>
<td>4.0</td>
</tr>
<tr>
<td>$48,001-$73K&lt;sup&gt;^&lt;/sup&gt;  </td>
<td>2.8</td>
</tr>
<tr>
<td>$73,001+&lt;sup&gt;^&lt;/sup&gt;  </td>
<td>4.9</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
</tr>
<tr>
<td>Sturgis&lt;sup&gt;^&lt;/sup&gt;  </td>
<td>9.3</td>
</tr>
<tr>
<td>Pierre&lt;sup&gt;^&lt;/sup&gt;  </td>
<td>4.8</td>
</tr>
<tr>
<td>Aberdeen&lt;sup&gt;^&lt;/sup&gt;  </td>
<td>4.4</td>
</tr>
<tr>
<td>Watertown&lt;sup&gt;^&lt;/sup&gt;  </td>
<td>2.9</td>
</tr>
<tr>
<td>Sioux Falls</td>
<td>7.1</td>
</tr>
<tr>
<td>Mitchell&lt;sup&gt;^&lt;/sup&gt;  </td>
<td>9.3</td>
</tr>
<tr>
<td>Rapid City</td>
<td>4.9</td>
</tr>
</tbody>
</table>

* p-value < 0.05 based on Rao-Scott chi-square test.

<sup>^</sup> Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

---

Healthy People 2020 (9.4% for all births, not just singletons)
Figure 17.3: Risk behaviors and outcomes by mothers with a singleton infant who was born preterm, South Dakota, 2018 (weighted)

* p-value < 0.05  ** p-value < 0.01  p-value based on Rao-Scott chi-square test.
^^ Chi-square test not calculated because of zero counts.
NICU = neonatal intensive care unit

References
## Chapter 18: Infant safe sleep

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infant sleep practices</strong></td>
<td></td>
</tr>
<tr>
<td>Infant most often laid to sleep on back</td>
<td>87.0 (84.5-89.5, 9485)</td>
</tr>
<tr>
<td>Infant sleeps alone in his or her own crib or bed</td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>61.3 (57.8-64.7, 6690)</td>
</tr>
<tr>
<td>Often/almost always</td>
<td>17.4 (14.7-20.2, 1901)</td>
</tr>
<tr>
<td>When infant sleeps alone, the crib or bed is in the same room as the mother</td>
<td>76.4 (73.0-79.7, 7581)</td>
</tr>
<tr>
<td><strong>How infant usually slept in the past 2 weeks</strong></td>
<td></td>
</tr>
<tr>
<td>In a crib, bassinet, or pack and play</td>
<td>89.4 (87.2-91.6, 9755)</td>
</tr>
<tr>
<td>On a twin or larger mattress or bed</td>
<td>24.4 (21.4-27.3, 2609)</td>
</tr>
<tr>
<td>On a couch, sofa, or armchair</td>
<td>8.0 (6.1-10.0, 858)</td>
</tr>
<tr>
<td>In an infant car seat or swing</td>
<td>39.8 (36.2-43.4, 4251)</td>
</tr>
<tr>
<td>In a sleeping sack or wearable blanket</td>
<td>44.7 (41.1-48.4, 4783)</td>
</tr>
<tr>
<td>With a blanket</td>
<td>47.7 (44.0-51.4, 5055)</td>
</tr>
<tr>
<td>With toys, cushions, or pillows, including nursing pillows</td>
<td>6.7 (4.9-8.5, 719)</td>
</tr>
<tr>
<td>With crib bumper pads (mesh or non-mesh)</td>
<td>10.1 (7.9-12.2, 1072)</td>
</tr>
<tr>
<td><strong>Infants were placed to sleep</strong></td>
<td></td>
</tr>
<tr>
<td>On approved sleep surface</td>
<td>40.8 (37.2-44.4, 4380)</td>
</tr>
<tr>
<td>Without soft objects or loose bedding</td>
<td>46.3 (42.7-50.0, 4923)</td>
</tr>
<tr>
<td>Room-sharing without bed-sharing</td>
<td>43.1 (39.4-46.7, 4653)</td>
</tr>
<tr>
<td><strong>Infant sleep recommendations discussed by health care worker</strong></td>
<td></td>
</tr>
<tr>
<td>Place infant on back to sleep</td>
<td>96.5 (95.3-97.7, 10475)</td>
</tr>
<tr>
<td>Place infant to sleep in a crib, bassinet, or pack and play</td>
<td>91.6 (89.7-93.5, 9953)</td>
</tr>
<tr>
<td>Place infant’s crib or bed in mother’s room</td>
<td>54.8 (51.2-58.5, 5931)</td>
</tr>
<tr>
<td>What things should and should not go in the infant’s bed</td>
<td>90.3 (88.2-92.4, 9814)</td>
</tr>
</tbody>
</table>

**Significance**

Although the rate of SIDS in the United States has decreased from 130.3 deaths per 100,000 live births in 1990 to 38.0 deaths per 100,000 live births in 2016, deaths from both unknown causes and accidental suffocation/strangulation have been increasing since 1997 (1). The 2013-2015 rate for sudden unexplained infant deaths (SUID) for the United States was 89.2/100,000 live births with a rate in South Dakota of 157.3/100,000 live births, resulting in a rank of 46th out of 50 states (2). Due to similarities in many of the risk factors for SIDS and suffocation-related infant deaths, the American Academy of Pediatrics released updated recommendations for a safe sleep environment to reduce SIDS and sleep-related infant deaths related to suffocation and entrapment based on available data (3).

**PRAMS asked women:**

Q56  In which one position do you *most often* lay your baby down to sleep now? [List]
Q57  In the *past 2 weeks*, how often has your new baby slept alone in his or her own crib or bed? [List]
Q58  When your new baby sleeps alone, is his or her crib or bed in the same room where you sleep?
Q59  Listed below are some more things about how babies sleep. How did your new baby *usually* sleep in the *past 2 weeks*? [List]
Q60  Did a doctor, nurse, or other health care worker tell you any of the following things? [List]

**Healthy People 2020 Objectives**

- **MICH-20** Increase the proportion of infants who are put to sleep on their backs to 76%.
Definitions

- **Sudden unexpected infant death (SUID)** is a term used to describe any sudden and unexpected death, whether explained or unexplained, and includes sudden infant death syndrome (SIDS) and sleep-related infant deaths.
- **Approved sleep surface** is a composite of how the infant usually slept in the past 2 weeks: 1) alone in their own crib or bed (always/often versus sometimes/rarely/never) 2) in a crib, bassinet, or pack and play 3) not in a standard bed 4) not in a couch or armchair 5) not in car seat or swing.
- **Without soft objects or loose bedding** is a composite of three items indicating that the infant usually slept without 1) blankets; 2) toys, cushions, or pillows; and 3) crib bumper pads.
- **Room-sharing without bed-sharing** is a composite of two items indicating that the infant usually slept 1) alone in their own crib or bed (always versus often/sometimes/rarely/never) and 2) in the same room as their mothers.

Infant laid on back to sleep

Prevalence and Trends (Figure 18.1)
The percentage of South Dakota mothers who placed their infant on his or her back to sleep has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 76% has been achieved for all years.

Figure 18.1: Mothers who placed their infant on his or her back to sleep by year, South Dakota, 2017-2018 (weighted)
Demographic Characteristics (Figure 18.2)
- Overall prevalence of South Dakota mothers who placed their infant on his or her back to sleep was 87.0%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with mothers placing their infant on his or her back to sleep included maternal education, and household income.
- Mothers who had more years of education and had a greater household income had higher prevalence of placing their infant on his or her back to sleep compared with their counterparts.

Risk Behaviors and Outcomes (Figure 18.3)
Mothers who placed their infant on his or her back to sleep, compared to mothers who did not place their infant on his or her back to sleep, were significantly (p-value less than 0.05) more likely to report that:
- They were obese prior to pregnancy (24.8% vs. 14.0%).

Mothers who placed their infant on his or her back to sleep, compared to mothers who did not place their infant on his or her back to sleep, were significantly (p-value less than 0.05) less likely to report that:
- They started prenatal care after the first trimester or had no prenatal care (14.6% vs. 24.9%).
Figure 18.2: Percentage of mothers who most often laid their infant to sleep on their back by demographic characteristics, South Dakota, 2018 (weighted)

* p-value < 0.05 based on Rao-Scott chi-square test.
+ p-value < 0.05, ++ p-value < 0.01 based on logistic regression results for linear trend.

Healthy People 2020 (76%)
Figure 18.3: Risk behaviors and outcomes by mothers who placed their infant to sleep on his or her back, South Dakota, 2018 (weighted)

![Bar chart showing Maternal Obesity Before Preg.* and Delayed or No PNC *](chart)

* p-value < 0.05  p-value based on Rao-Scott chi-square test.
PNC = prenatal care

Infant sleeps on an approved surface
Prevalence and Trends (Figure 18.4)
The percentage of South Dakota mothers who placed their infant on infants on an approved sleep surface has not changed (p-value for linear trend greater than 0.05).

Figure 18.4: Mothers who placed their infant on an approved sleep surface by year, South Dakota, 2017-2018 (weighted)
Demographic Characteristics (Figure 18.5)
- Overall prevalence of South Dakota mothers who placed their infants on an approved sleep surface was 40.8%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with placing the infant on an approved sleep surface included maternal race, marital status, household income, and the region of the state the mother resides.
- Mothers who were white, were married, and had greater household income had a higher prevalence of placing the infant on an approved sleep surface compared with their counterparts. Mothers who resided in the Mitchell region had the highest proportion of mothers who placed their infants on an approved sleep surface.

Risk Behaviors and Outcomes (Figure 18.6)
Mothers who most often laid their infant to sleep on an approved sleep surface, compared to mothers who did not, were significantly (p-value less than 0.05) more likely to report that:
- Their infant was high birth weight (>4000 grams) (12.6% vs. 7.4%).

Mothers who most often laid their infant to sleep on an approved sleep surface, compared to mothers who did not, were significantly (p-value less than 0.05) less likely to report that:
- They used illicit drugs the 3 months before pregnancy (4.3% vs. 11.2%).
- They suffered emotional abuse during pregnancy (2.2% vs. 9.8%).
- Their infant does not sleep alone in the mother’s room (39.9% vs. 68.9%).
- They had a high ACE score (4+) (15.6% vs. 27.4%).
Figure 18.5: Percentage of mothers who most often laid their infant to sleep on an approved sleep surface by demographic characteristics, South Dakota, 2018 (weighted)

- **Race**
  - White, Non-Hisp.: 44.9
  - Amer. Indian: 25.7
  - Other Races: 36.9

- **Ethnicity**
  - Hisp.: 41.8
  - Non-Hisp.: 40.8

- **Age**
  - <20 yrs: 27.1
  - 20-24 yrs: 34.4
  - 25-29 yrs: 48.6
  - 30-34 yrs: 39.7
  - 35 yrs: 36.4

- **Education**
  - <12 yrs: 38.9
  - 12 yrs: 37.4
  - >12 yrs: 42.6

- **Marital Status**
  - Not Married: 34.0
  - Married: 44.5

- **Annual Income**
  - <$16K: 30.9
  - $16,001-$28K: 38.1
  - $28,001-$48K: 37.9
  - $48,001-$73K: 41.0
  - $73,001+: 49.8

- **Region**
  - Sturgis: 38.8
  - Pierre: 32.2
  - Aberdeen: 38.4
  - Watertown: 47.0
  - Sioux Falls: 41.1
  - Mitchell: 57.1
  - Rapid City: 33.0

* p-value < 0.05 based on Rao-Scott chi-square test.
++ p-value < 0.05 based on logistic regression results for linear trend
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
Figure 18.6: Risk behaviors and outcomes by mothers who most often laid their infant to sleep on an approved sleep surface, South Dakota, 2018 (weighted)

- **Illicit Drugs 3-Mo. Before Preg.**
  - Sleeps on approved surface: 4.3%
  - Does not sleep on approved surface: 11.2%

- **Emotional Abuse During Pregnancy**
  - Sleeps on approved surface: 2.2%
  - Does not sleep on approved surface: 9.8%

- **High Birth Weight (>4000)**
  - Sleeps on approved surface: 12.6%
  - Does not sleep on approved surface: 7.4%

- **Does Not Sleep Alone in Room w/Mother**
  - Sleeps on approved surface: 39.9%
  - Does not sleep on approved surface: 68.9%

- **ACE Score 4+**
  - Sleeps on approved surface: 15.6%
  - Does not sleep on approved surface: 27.4%

* p-value < 0.05  ** p-value < 0.01

p-value based on Rao-Scott chi-square test.
ACE = adverse childhood experiences
No soft objects or loose bedding in infant’s sleep area

Prevalence and Trends (Figure 18.7)

The percentage of South Dakota mothers who most often laid their infant to sleep without soft objects or loose bedding has not changed (p-value greater than 0.05).

Figure 18.7: Mothers who most often laid their infant to sleep without soft objects or loose bedding by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 18.8)

• Overall prevalence of South Dakota mothers who most often laid their infant to sleep without soft objects or loose bedding was 46.3%.
• Demographic characteristics that were significantly (p-value less than 0.05) associated with laying their infant to sleep without soft objects or loose bedding included maternal race, age, education, marital status, household income, and region of the state that the mother resided.
• Mothers who were white or of other races, older (25-34 years of age), had more years of education, were married, had greater household income, and resided in the Sioux Falls or Watertown regions had a higher prevalence of laying their infant to sleep without soft objects or loose bedding compared with their counterparts. Mothers who resided in the Sturgis or Mitchell regions had the lowest percentage of mothers who laid their infant to sleep without soft objects or loose bedding.

Risk Behaviors and Outcomes (Figure 18.9)

Mothers whose infant slept without soft objects or loose bedding, compared to mothers whose infant slept with soft objects or loose bedding, were significantly (p-value less than 0.05) less likely to report that:

• They smoked the 3 months before pregnancy (19.5% vs. 28.8%).
• They were obese prior to pregnancy (19.2% vs. 27.0%).
• They started prenatal care after the first trimester or had no prenatal care (10.6% vs. 20.3%).
• They did not have their teeth cleaned during pregnancy (42.5% vs. 58.8%).
• Their baby is exposed to smoke (1.0% vs. 4.2%; interpret these percentages with caution).
• They had a high ACE score (4+) (16.3% vs. 28.3%).
Figure 18.8: Percentage of mothers whose infant slept without soft objects or loose bedding by demographic characteristics, South Dakota, 2018 (weighted)

- **Race**: White, Non-Hisp. 48.0, Amer. Indian 37.6, Other Races 48.2
- **Ethnicity**: Hisp. 50.6, Non-Hisp. 46.2
- **Age**: <20 yrs 30.1, 20-24 yrs 40.0, 25-29 yrs 48.3, 30-34 yrs 54.2, >=35 yrs 33.5
- **Education**: <12 yrs 33.0, 12 yrs 32.7, >12 yrs 53.8
- **Marital Status**: Not Married 37.8, Married 50.8
- **Annual Income**: <$16K 36.9, $16,001-$28K 32.2, $28,001-$48K 42.6, $48,001-$73K 50.8, $73,001+ 58.5
- **Region**: Sturgis 28.5, Pierre 37.4, Aberdeen 44.4, Watertown 47.7, Sioux Falls 53.0, Mitchell 34.6, Rapid City 50.7

* p-value < 0.05, ** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.
Figure 18.9: Risk behaviors and outcomes by mothers whose infant slept without soft objects or loose bedding, South Dakota, 2018 (weighted)

- * p-value < 0.05
- ** p-value < 0.01
- p-value based on Rao-Scott chi-square test.
- ^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
- PNC = prenatal care; ACE = adverse childhood experiences

- Smoke 3-Mo. Before Preg.**
  - No soft bedding or loose blankets: 19.5%
  - Soft bedding or loose blankets: 28.8%

- Maternal Obesity Before Preg.*
  - No soft bedding or loose blankets: 19.2%
  - Soft bedding or loose blankets: 27.0%

- Delayed or No PNC **
  - No soft bedding or loose blankets: 10.6%
  - Soft bedding or loose blankets: 20.3%

- Teeth Not Cleaned During Preg.**
  - No soft bedding or loose blankets: 42.5%
  - Soft bedding or loose blankets: 58.8%

- Baby Exposed to Smoke**^
  - No soft bedding or loose blankets: 1.0%
  - Soft bedding or loose blankets: 4.2%

- ACE Score 4+ **
  - No soft bedding or loose blankets: 16.3%
  - Soft bedding or loose blankets: 28.3%
Infant sleeps alone in the mother’s room (room-sharing without bed-sharing)

Prevalence and Trends (Figure 18.10)
The percentage of South Dakota mothers who most often laid their infant to sleep without soft objects or loose bedding has not changed (p-value for linear trend greater than 0.05).

Figure 18.10: Mothers whose infant room-shared without bed-sharing by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 18.11)
- Overall prevalence of South Dakota mothers whose infant room-shared without bed-sharing was 43.1%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with room-sharing without bed-sharing included maternal race, ethnicity, education, household income and region of the state that the mother resided.
- Mothers who were of other races, Hispanic, had less years of education, and had less household income had a higher prevalence of room-sharing without bed-sharing compared with their counterparts.

Risk Behaviors and Outcomes (Figure 18.12)
Mothers whose infant room-shared without bed-sharing, compared to mothers whose infant did not room-share without bed-sharing, were significantly (p-value less than 0.05) more likely to report that:
- They did not have their teeth cleaned during pregnancy (56.2% vs. 47.1%).

Mothers whose infant room-shared without bed-sharing, compared to mothers whose infant did not room-share without bed-sharing, were significantly (p-value less than 0.05) less likely to report that:
- They drank alcohol the 3 months before pregnancy (62.4% vs. 70.9%).
- They used illicit drugs the 3 months before pregnancy (4.9% vs. 10.5%).
- They had a high ACE score (4+) (16.5% vs. 26.7%).
Figure 18.11: Percentage of mothers whose infant room-shares without bed-sharing by demographic characteristics, South Dakota, 2018 (weighted)

- Race: White, Non-Hisp. 43.2%, Amer. Indian 34.3%, Other Races 55.4%
- Ethnicity: Hisp. 57.8%, Non-Hisp. 42.3%
- Age: <20 yrs 40.4%, 20-24 yrs 44.6%, 25-29 yrs 46.5%, 30-34 yrs 39.9%, >=35 yrs 40.5%
- Education: <12 yrs 51.5%, 12 yrs 46.6%, >12 yrs 40.0%
- Marital Status: Not Married 42.1%, Married 43.6%
- Annual Income: <$16K 50.0%, $16,001-$28K 43.4%, $28,001-$48K 48.2%, $48,001-$73K 43.2%, $73,001+ 34.5%
- Region: Sturgis 48.3%, Pierre 44.0%, Aberdeen 38.3%, Watertown 46.9%, Sioux Falls 42.2%, Mitchell 62.1%, Rapid City 32.2%

* p-value < 0.05, ** p-value < 0.01 based on Rao-Scott chi-square test.
+ p-value < 0.05, ++ p-value < 0.01 based on logistic regression results for linear trend.
Figure 18.12: Risk behaviors and outcomes by mothers whose infant room-shares without bed-sharing, South Dakota, 2018 (weighted)

* p-value < 0.05     ** p-value < 0.01
p-value based on Rao-Scott chi-square test.

References


### Chapter 19: Postpartum health and birth control use

**Measure** | % of women (95% CI, N)
---|---
**Services women received postpartum** |  
Attended postpartum health check-up | 89.4 (87.4-91.4, 9942)

*Among those women with a postpartum check-up, the following was done*
  - Asked about feeling down or depressed | 95.0 (93.4-96.7, 9392)
  - Discussed birth control methods | 90.4 (88.0-92.8, 8968)
  - Asked if someone was being abusive either emotionally or physically | 73.1 (69.6-76.6, 7196)
  - Asked about smoking cigarettes | 71.0 (67.5-74.5, 7011)
  - Told to take a vitamin with folic acid | 60.3 (56.5-64.1, 5973)
  - Discussed healthy eating, exercise, and losing weight gained during pregnancy | 57.8 (54.0-61.6, 5724)
  - Discussed how long to wait before getting pregnant again | 47.8 (44.0-51.7, 4706)
  - Given or prescribed a contraceptive method | 41.1 (37.2-44.9, 4059)
  - Inserted an IUD or a contraceptive implant | 22.5 (19.3-25.7, 2218)
  - Tested for diabetes | 17.4 (14.8-20.0, 1701)

**Use of postpartum birth control** |  
Women who were using postpartum birth control | 76.8 (73.8-79.8, 8515)

*Among women who were not pregnant or trying to get pregnant at the time of the survey, type of contraceptive being used*
  - None | 20.6 (17.7-23.5, 2170)
  - Least effective contraceptive | 21.6 (18.6-24.7, 2276)
  - Moderately effective contraceptive | 25.0 (21.8-28.3, 2635)
  - Most effective contraceptive | 32.8 (29.3-36.3, 3452)

*Among women who were not using postpartum birth control, reasons for non-use:*
  - Did not want to use birth control | 45.4 (38.3-52.6, 1207)
  - Worried about side effects from birth control | 26.1 (19.9-32.3, 698)
  - Not having sex | 23.5 (17.6-29.4, 628)
  - Wanted to get pregnant | 14.2 (9.5-19.0, 381)
  - Her husband or partner didn’t want to use anything | 6.3 (3.2-9.4, 168)
  - Had tubes tied or blocked | 8.2 (5.5-13.0, 220)
  - Currently pregnant | 3.1 (0.7-5.4, 82)^
  - Had problems paying for birth control | 7.9 (3.0-12.9, 212)^

**Depressive symptoms, postpartum** | 13.0 (10.7-15.3, 1435)

^Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

**Significance**

Postpartum care visits allow for the identification of pregnancy-related issues like postpartum depression, gestational diabetes and breast health, along with providing additional information on breastfeeding (1). Early postpartum care of the mother offers opportunities for healthcare providers to assess specific behaviors and needs of the mother, which ultimately can affect infant health care. The American College of Obstetricians and Gynecologists recommends that mothers attend a postpartum visit 4 to 6 weeks after delivery (1).

**PRAMS asked women:**

Q61 Are you or your husband or partner doing anything now to keep from getting pregnant?
Q62 What are your reasons for not doing anything to keep from getting pregnant now? [List]
Q63 What kind of birth control are you or your husband or partner using now to keep from getting pregnant? [List]
Q64 Since your new baby was born, have you had a postpartum checkup for yourself?
Q65  *During your postpartum checkup,* did a doctor, nurse, or other health care worker do any of the following things? [List]

Q66  *Since your new baby was born,* how often have you felt down, depressed, or hopeless? [List]

Q67  *Since your new baby was born,* how often have you had little interest or little pleasure in doing things you usually enjoyed? [List]

**Healthy People 2020 Objectives**

- **MICH-19** Increase the proportion of women giving birth who attend a postpartum care visit with a health care worker to 91%.
- **MICH-16.6** Increase the proportion of women delivering a live birth who used a most effective or moderately effective contraception method postpartum to 59%.

**Definition**

*Postpartum symptoms* were based on a composite score based on having little interest or pleasure in doing things that are usually enjoyed and how often the mother felt down, depressed or hopeless.

*Effectiveness of birth control* was defined as 1) most effective [female/male sterilization, implant, IUD], 2) moderately effective [DMPA, pills, patch/ring], 3) least effective [condoms, NFP, withdrawal], or 4) no method.

**Attended Postpartum Visit**

**Prevalence and Trends (Figure 19.1)**

The percentage of South Dakota mothers who attended a postpartum visit has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 91% was achieved in 2017.

**Figure 19.1:**  Mothers who attended a postpartum visit by year, South Dakota, 2017-2018 (weighted)
Demographic Characteristics (Figure 19.2)
- Overall prevalence of South Dakota mothers who attended a postpartum visit was 89.4%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with attending a postpartum visit included maternal race, education, marital status, household income, and region of the state that the mother resided.
- Mothers who were white, had more years of education, were married, and had greater household income had a higher prevalence of attending a postpartum visit compared with their counterparts. Mothers from the Mitchell region had the lowest proportion of mothers attending a postpartum visit.

Risk Behaviors and Outcomes (Figure 19.3)
Mothers who attended a postpartum visit, compared to mothers who did not attend a postpartum visit, were significantly (p-value less than 0.05) more likely to report that:
- They drank alcohol the 3 months before pregnancy (68.4% vs. 57.8%).

Mothers who attended a postpartum visit, compared to mothers who did not attend a postpartum visit, were significantly (p-value less than 0.05) less likely to report that:
- They were uninsured before pregnancy (12.1% vs. 22.6%).
- They smoked the 3 months before pregnancy (22.5% vs. 44.9%).
- They used illicit drugs the 3 months before pregnancy (6.9% vs. 23.7%).
- They started prenatal care after the first trimester or had no prenatal care (14.5% vs. 36.8%).
- They attended less than 80% of their prenatal visits (15.6% vs. 33.1%).
- They did not have their teeth cleaned during pregnancy (49.4% vs. 67.9%).
- They suffered emotional abuse during pregnancy (5.7% vs. 17.8%).
- They never breastfed their infant (6.7% vs. 21.2%).
- They had a high ACE score (4+) (20.6% vs. 36.4%).
Figure 19.2: Percentage of mothers who attended a postpartum visit by demographic characteristics, South Dakota, 2018 (weighted)

- Race: White, Non-Hisp. (93.7%), Amer. Indian (71.1%), Other Races (89.2%)
- Ethnicity: Hisp. (85.7%), Non-Hisp. (89.7%)
- Age: <20 yrs (82.2%), 20-24 yrs (84.7%), 25-29 yrs (90.7%), 30-34 yrs (92.4%), >=35 yrs (87.3%)
- Education: <12 yrs (75.7%), 12 yrs (85.9%), >12 yrs (93.9%)
- Marital Status: Not Married (81.4%), Married (93.8%)
- Annual Income: <$16K (77.8%), $16,001-$28K (78.5%), $28,001-$48K (94.5%), $48,001-$73K (96.0%), $73,001+ (95.6%)
- Region: Sturgis (89.1%), Pierre (86.5%), Aberdeen (94.3%), Watertown (92.8%), Sioux Falls (91.7%), Mitchell (80.2%), Rapid City (85.6%)

* p-value < 0.05, ** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.

Healthy People 2020 (91%)
Figure 19.3: Risk behaviors and outcomes by mothers who attended a postpartum visit, South Dakota, 2018 (weighted)

- Not Insured Before Preg.*
- Smoke 3-Mo. Before Preg.**
- Alcohol 3-Mo. Before Preg.*
- Illicit Drugs 3-Mo. Before Preg.**
- Delayed or No PNC **
- Attended <80% of PNC Visits**
- Teeth Not Cleaned During Preg.**
- Emotional Abuse During Pregnancy**
- Never Breast-Fed **
- ACE Score 4+ **

* p-value < 0.05    ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
PNC = prenatal care; ACE = adverse childhood experiences
Indications of Postpartum Depression
Prevalence and Trends (Figure 19.4)
The percentage of South Dakota mothers who had indications of postpartum depression has not changed (p-value for linear trend greater than 0.05).

Figure 19.4: Mothers who had indication of postpartum depression by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 19.5)
- Overall prevalence of South Dakota mothers who had indications of postpartum depression was 13.0%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with having indications of postpartum depression included maternal race, age, education, marital status, and household income.
- Mothers who were American Indian, younger, had less years of education, were not married, and had less household income had a higher prevalence of postpartum depression compared with their counterparts.

Risk Behaviors and Outcomes (Figure 19.6)
Mothers who had postpartum depression, compared to mothers who did not have postpartum depression, were significantly (p-value less than 0.05) more likely to report that:
- They smoked the 3 months before pregnancy (36.2% vs. 23.3%).
- They used illicit drugs the 3 months before pregnancy (13.4% vs. 7.9%).
- They did not have their teeth cleaned during pregnancy (66.2% vs. 49.2%).
- They suffered emotional abuse during pregnancy (15.3% vs. 5.8%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (56.8% vs. 28.1%).
- They had a high ACE score (4+) (44.1% vs. 19.2%).
Figure 19.5: Percentage of mothers who exhibited postpartum depressive symptoms by demographic characteristics, South Dakota, 2018 (weighted)

** Race
- White, Non-Hisp.: 9.8%
- Amer. Indian: 25.4%
- Other Races: 15.2%

++ Ethnicity
- Hisp.: 7.9%
- Non-Hisp.: 13.3%

++ Age
- <20 yrs: 25.1%
- 20-24 yrs: 20.6%
- 25-29 yrs: 11.5%
- 30-34 yrs: 10.2%
- >=35 yrs: 8.2%

++ Education
- <12 yrs: 21.4%
- 12 yrs: 16.2%
- >12 yrs: 10.2%

++ Marital Status
- Not Married: 18.8%
- Married: 9.8%

++ Annual Income
- <$16K: 21.3%
- $16,001-$28K: 9.5%
- $28,001-$48K: 17.0%
- $48,001-$73K: 11.3%
- $73,001+: 5.9%

++ Region
- Sturgis: 22.5%
- Pierre: 17.2%
- Aberdeen: 7.1%
- Watertown: 12.7%
- Sioux Falls: 10.4%
- Mitchell: 13.0%
- Rapid City: 15.2%

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.
Figure 19.6: Risk behaviors and outcomes by mothers who exhibited symptoms of postpartum depression, South Dakota, 2018 (weighted)

* p-value < 0.05     ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
ACE = adverse childhood experiences

References
Chapter 20: Adverse Childhood Experiences (ACEs) and handling life events

### Measure

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACE Score</strong></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>39.1 (35.6-42.5, 4338)</td>
</tr>
<tr>
<td>1</td>
<td>19.1 (16.3-21.9, 2121)</td>
</tr>
<tr>
<td>2</td>
<td>11.4 (9.0-13.7, 1260)</td>
</tr>
<tr>
<td>3</td>
<td>8.2 (6.2-10.2, 912)</td>
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<tr>
<td>4 or greater</td>
<td>22.2 (19.2-25.2, 2468)</td>
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<td><strong>ACES</strong></td>
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<td>Sexual abuse</td>
<td>13.8 (11.3-16.3, 1512)</td>
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<td>Emotional abuse</td>
<td>24.7 (21.6-27.9, 2743)</td>
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<tr>
<td>Physical abuse</td>
<td>16.7 (14.0-19.5, 1846)</td>
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<tr>
<td>Emotional neglect</td>
<td>16.2 (13.6-18.9, 1791)</td>
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<tr>
<td>Physical neglect</td>
<td>7.9 (5.9-9.9, 872)</td>
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<tr>
<td>Parental divorce or separation</td>
<td>42.3 (38.7-45.8, 4663)</td>
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<tr>
<td>Household substance abuse</td>
<td>29.5 (26.2-32.8, 3249)</td>
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<tr>
<td>Household mental illness</td>
<td>24.3 (21.2-27.5, 2687)</td>
</tr>
<tr>
<td>Incarcerated household member</td>
<td>11.7 (9.5-14.0, 1288)</td>
</tr>
<tr>
<td>Mother treated violently</td>
<td>12.6 (10.4-14.9, 1393)</td>
</tr>
<tr>
<td><strong>Handling life events</strong></td>
<td></td>
</tr>
<tr>
<td>Bounces back quickly after hard times</td>
<td>61.4 (57.9-64.9, 6838)</td>
</tr>
<tr>
<td>Hard time making it through stressful events</td>
<td>13.6 (11.2-16.1, 1519)</td>
</tr>
<tr>
<td>Does not take long to recover from a stressful event</td>
<td>57.1 (53.5-60.6, 6351)</td>
</tr>
<tr>
<td>Hard to snap back when something bad happens</td>
<td>13.3 (10.8-15.7, 1470)</td>
</tr>
<tr>
<td>Usually comes through a difficult time with little trouble</td>
<td>55.8 (52.2-59.3, 6182)</td>
</tr>
<tr>
<td>Takes a long time to get over set-backs</td>
<td>9.4 (7.3-11.5, 1050)</td>
</tr>
</tbody>
</table>

### Significance

Adverse childhood experiences (ACEs) refer to early life experiences and can be categorized into three areas: 1.) abuse, 2.) neglect, and 3.) household dysfunction. The original ACE Study was based at Kaiser Permanente’s San Diego Health Appraisal Clinic and was conducted in collaboration with the Centers for Disease Control and Prevention (1). Results from numerous studies indicate that ACEs are common among adults, and that having even one adverse childhood experience correlates to higher risk for other adverse experiences (1,2). High ACE scores have been shown to be associated with adult health risk behaviors and diseases including alcoholism, drug abuse, smoking, poor self-rated health, fifty or more sexual partners, sexually transmitted diseases, physical inactivity, suicide attempt, adult depression, obesity, ischemic heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease (1-4).

PRAMS asked women:

**Q73** The following statements are about the way you handle life events. Please check all that are true for you most of the time. [List]

**Q74** While you were growing up, during your first 18 years of life: Were your parents ever separated or divorced? Did you live with anyone who was a problem drinker or alcoholic or who used street drugs? Was a household member depressed or mentally ill, or did a household member attempt suicide? Did a household member go to prison? Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way OR attempt or actually have oral, anal, or vaginal intercourse with you?

**Q75** While you were growing up, during your first 18 years of life, did any of the following things happen...
often or very often?: Did a parent or other adult in the household swear at you, insult you, put you down, or humiliate you OR act in a way that made you afraid that you might be physically hurt? … push, grab, slap, or throw something at you OR ever hit you so hard that you had marks or were injured? Did you feel that no one in your family loved you or thought you were important or special OR your family didn’t look out for each other, feel close to each other, or support each other? …that you didn’t have enough to eat, had to wear dirty clothes, and had no one to protect you OR your parents were too drunk or high to take care of you or take you to the doctor if you needed it? Was your mother or stepmother pushed, grabbed, slapped, or had something thrown at her OR sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard OR ever repeatedly hit at least a few minutes or threatened with a gun or knife?

Healthy People 2020 Objective
- SDOH-5 Proportion of children aged 0-17 years who have ever lived with a parent who has served time in jail or prison (no target set).

Definitions
ACE scores are calculated as the sum of each positive response for the 10 questions listed below. ACE scores were considered missing if more than five ACE questions were unanswered.

<table>
<thead>
<tr>
<th>Category</th>
<th>Specific question:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abuse</td>
<td></td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way OR attempt or actually have oral, anal, or vaginal intercourse with you?</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>Did a parent or other adult in the household swear at you, insult you, put you down, or humiliate you OR act in a way that made you afraid that you might be physically hurt?</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>Did a parent or other adult in the household push, grab, slap, or throw something at you OR ever hit you so hard that you had marks or were injured?</td>
</tr>
<tr>
<td>Neglect</td>
<td></td>
</tr>
<tr>
<td>Emotional neglect</td>
<td>Did you feel that no one in your family loved you or thought you were important or special OR your family didn’t look out for each other, feel close to each other, or support each other?</td>
</tr>
<tr>
<td>Physical Neglect</td>
<td>Did you feel that you didn’t have enough to eat, had to wear dirty clothes, and had no one to protect you OR your parents were too drunk or high to take care of you or take you to the doctor if you needed it?</td>
</tr>
<tr>
<td>Household (HH) dysfunction</td>
<td></td>
</tr>
<tr>
<td>Parental divorce or separation</td>
<td>Were your parents ever separated or divorced?</td>
</tr>
<tr>
<td>HH Substance abuse</td>
<td>Did you live with someone who was a problem drinker or alcoholic or who used street drugs?</td>
</tr>
<tr>
<td>HH Mental illness</td>
<td>Was a household member depressed or mentally ill, or did a household member attempt suicide?</td>
</tr>
<tr>
<td>Incarcerated HH member</td>
<td>Did a household member go to prison?</td>
</tr>
<tr>
<td>Mother treated violently</td>
<td>Was your mother or stepmother pushed, grabbed, slapped, or had something thrown at her OR sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard OR ever repeatedly hit at least a few minutes or threatened with a gun or knife?</td>
</tr>
</tbody>
</table>
**High ACE Score (4+)**

**Prevalence and Trends (Figure 20.1)**

The percentage of South Dakota mothers who have high ACE has not changed (p-value for linear trend greater than 0.05).

**Figure 20.1:** Mothers with a high ACE (4+) score by year, South Dakota, 2017-2018 (weighted)

![Graph showing high ACE score by year](image)

**Demographic Characteristics (Figure 20.2)**

- Overall prevalence of South Dakota mothers who had high a high ACE score (4+) was 22.2%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with a high ACE score included maternal race, age, education, marital status, and household income.
- Mothers who were American Indian, younger (20-24 years of age), had less years of education, were not married, and had less household income had a higher prevalence of a high ACE score compared with their counterparts.

**Risk Behaviors and Outcomes (Figure 20.3)**

Mothers who had high ACE scores, compared to mothers who did not have high ACE scores, were significantly (p-value less than 0.05) more likely to report that:

- They were uninsured before pregnancy (23.6% vs. 10.2%).
- They smoked the 3 months before pregnancy (47.3% vs. 18.4%).
- They used illicit drugs the 3 months before pregnancy (18.5% vs. 5.9%).
- They attended less than 80% of their prenatal visits (23.6% vs. 15.8%).
- They did not have their teeth cleaned during pregnancy (65.5% vs. 47.2%).
- They suffered emotional abuse during pregnancy (18.1% vs. 3.7%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (50.1% vs. 26.1%).
- Their infant does not sleep alone in the mother’s room (68.1% vs. 53.7%).
- Their baby is exposed to smoke (5.2% vs. 1.9%).
Figure 20.2: Percentage of mothers with a high ACE score (greater or equal to 4) by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.
Figure 20.3: Risk behaviors and outcomes by mothers with a high ACE Score (greater than or equal to 4), South Dakota, 2018 (weighted)

- ** Not Insured Before Preg.**: 10.2% (ACE score less than 4) vs. 23.6% (ACE score of 4 or greater)
- ** Smoke 3-Mo. Before Preg.**: 5.9% (ACE score less than 4) vs. 18.5% (ACE score of 4 or greater)
- ** Illicit Drugs 3-Mo. Before Preg.**: 5.9% (ACE score less than 4) vs. 18.5% (ACE score of 4 or greater)
- ** Attended <80% of PNC Visits**: 3.7% (ACE score less than 4) vs. 18.1% (ACE score of 4 or greater)
- ** Teeth Not Cleaned During Preg.**: 3.7% (ACE score less than 4) vs. 18.1% (ACE score of 4 or greater)
- ** Emotional Abuse During Pregnancy**: 3.7% (ACE score less than 4) vs. 18.1% (ACE score of 4 or greater)
- ** Diabetes, Hypertension, or Depression During Preg.**: 3.7% (ACE score less than 4) vs. 18.1% (ACE score of 4 or greater)
- ** Does Not Sleep Alone in Room w/Mother**: 1.9% (ACE score less than 4) vs. 5.2% (ACE score of 4 or greater)
- ** Baby Exposed to Smoke**: 1.9% (ACE score less than 4) vs. 5.2% (ACE score of 4 or greater)

* p-value < 0.05  ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
References


## Chapter 21: Health insurance

### Measure^% of women (95% CI, N)

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coverage the month before pregnancy</strong></td>
<td></td>
</tr>
<tr>
<td>No insurance</td>
<td>13.1 (10.6-15.6, 1467)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>15.5 (13.2-17.8, 1727)</td>
</tr>
<tr>
<td>Indian Health Service</td>
<td>7.9 (6.8-9.0, 888)</td>
</tr>
<tr>
<td>Private health insurance from job or the job of husband or partner</td>
<td>52.0 (48.6-55.5, 5833)</td>
</tr>
<tr>
<td>Private health insurance from parents</td>
<td>9.2 (6.9-11.5, 1031)</td>
</tr>
<tr>
<td>Private health insurance from Health Insurance Marketplace/HealthCare.gov</td>
<td>4.1 (2.6-5.6, 461)</td>
</tr>
<tr>
<td>Other health insurance</td>
<td>4.5 (3.1-6.0, 507)</td>
</tr>
<tr>
<td><strong>Coverage prenatal care</strong></td>
<td></td>
</tr>
<tr>
<td>I did not go for prenatal care</td>
<td>2.1 (0.9-3.2, 232)</td>
</tr>
<tr>
<td>No insurance</td>
<td>2.5 (1.3-3.7, 273)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>32.5 (29.4-35.6, 3567)</td>
</tr>
<tr>
<td>Indian Health Service</td>
<td>6.8 (5.6-8.0, 747)</td>
</tr>
<tr>
<td>Private health insurance from job or the job of husband or partner</td>
<td>51.3 (47.9-54.8, 5631)</td>
</tr>
<tr>
<td>Private health insurance from parents</td>
<td>6.7 (4.6-8.8, 737)</td>
</tr>
<tr>
<td>Private health insurance from Health Insurance Marketplace/HealthCare.gov</td>
<td>5.1 (3.4-6.7, 555)</td>
</tr>
<tr>
<td>Other health insurance</td>
<td>4.8 (3.3-6.3, 526)</td>
</tr>
<tr>
<td>**Coverage after delivery **</td>
<td></td>
</tr>
<tr>
<td>No insurance</td>
<td>11.8 (9.5-14.0, 1319)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>17.9 (15.4-20.4, 1998)</td>
</tr>
<tr>
<td>Indian Health Service</td>
<td>6.5 (5.4-7.5, 726)</td>
</tr>
<tr>
<td>Private health insurance from job or the job of husband or partner</td>
<td>51.7 (48.3-55.2, 5799)</td>
</tr>
<tr>
<td>Private health insurance from parents</td>
<td>6.3 (4.2-8.4, 705)</td>
</tr>
<tr>
<td>Private health insurance from Health Insurance Marketplace/HealthCare.gov</td>
<td>5.2 (3.5-7.0, 585)</td>
</tr>
<tr>
<td>Other health insurance</td>
<td>3.9 (2.6-5.2, 437)</td>
</tr>
</tbody>
</table>

^ Women checked all that applied.
** At time of survey completion.

### Significance

Health insurance coverage is important for accessing health care and staying healthy. Nationally, 11% of women aged 19-64 years were not insured in 2015 (1). Lack of health care coverage for pregnant women is directly associated with inadequate prenatal care, which can lead to poor health outcomes (2). In 2008, it was estimated that if pregnant teenagers received prenatal care, it could save between $2,274 and $3,146 per pregnancy depending on the month prenatal care was begun, with costs related primarily to caring for low birth-weight infants (3).

**PRAMS asked women:**

Q13 During the *month before* you got pregnant with your new baby, what kind of health insurance did you have? Check ALL that apply [List]

Q14 During your *most recent pregnancy*, what kind of health insurance did you have for your *prenatal care*? Check ALL that apply [List]

Q15 What kind of health insurance do you have *now*? [List]

### Healthy People 2020 Objectives

- AHS-1.1 Increase the proportion of persons with medical insurance to 100% (0% for uninsured).
Uninsured Before Pregnancy
Prevalence and Trends (Figure 21.1)
The percentage of South Dakota mothers with no insurance the month before pregnancy has not changed (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 0% for uninsured has not been achieved in any year.

Figure 21.1: Mothers with no insurance coverage the month before pregnancy by year, South Dakota, 2017-2018 (weighted)

Demographic Characteristics (Figure 21.2)
- Overall prevalence of South Dakota mothers who were uninsured before pregnancy was 13.1%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with being uninsured before pregnancy included maternal race, ethnicity, education, marital status, and household income.
- Mothers who were of other races, Hispanic, younger (20-24 years of age), had less years of education, not married and had less household income had a higher prevalence of being uninsured before pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 21.3)
Mothers who had no insurance coverage the month before pregnancy, compared to mothers who did, were significantly (p-value less than 0.05) more likely to report that:
- They smoked the 3 months before pregnancy (47.1% vs. 21.6%).
- They used illicit drugs the 3 months before pregnancy (22.0% vs. 6.6%).
- They started prenatal care after the first trimester or had no prenatal care (33.2% vs. 14.2%).
- They did not have their teeth cleaned during pregnancy (78.3% vs. 47.3%).
- They suffered emotional abuse during pregnancy (12.4% vs. 6.1%).
- They never breastfed their infant (17.9% vs. 6.9%).
- They had a high ACE score (4+) (39.9% vs. 19.6%).

Mothers who had no insurance coverage before pregnancy, compared to mothers who did, were significantly (p-value less than 0.05) less likely to report that:
- They drank alcohol the 3 months before pregnancy (54.1% vs. 69.0%).
- Their infant was high birth weight (>4000 grams) (3.5% vs. 10.7%; interpret these percentages with caution).
Figure 21.2: Percentage of mothers with no insurance coverage the month before pregnancy by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p < 0.01 based on logistic regression results for linear trend.

Healthy People 2020 (100% insured, 0% uninsured)
Figure 21.3: Risk behaviors and outcomes by mothers with no insurance coverage before pregnancy, South Dakota, 2018 (weighted)

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Insured before pregnancy</th>
<th>Not insured before pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke 3-Mo. Before Preg. **</td>
<td>21.6</td>
<td>47.1</td>
</tr>
<tr>
<td>Alcohol 3-Mo. Before Preg. **</td>
<td></td>
<td>54.1</td>
</tr>
<tr>
<td>Illicit Drugs 3-Mo. Before Preg. **</td>
<td>6.6</td>
<td>22.0</td>
</tr>
<tr>
<td>Delayed or No PNC **</td>
<td>14.2</td>
<td>33.2</td>
</tr>
<tr>
<td>Teeth Not Cleaned During Preg. **</td>
<td></td>
<td>47.3</td>
</tr>
<tr>
<td>Emotional Abuse During Pregnancy*</td>
<td>6.1</td>
<td>12.4</td>
</tr>
<tr>
<td>High Birth Weight (&gt;4000)*^</td>
<td>3.5</td>
<td>10.7</td>
</tr>
<tr>
<td>Never Breast-Fed **</td>
<td>6.9</td>
<td>17.9</td>
</tr>
<tr>
<td>ACE Score 4+ **</td>
<td>19.6</td>
<td>39.9</td>
</tr>
</tbody>
</table>

* p-value < 0.05 ** p-value < 0.01
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
p-value based on Rao-Scott chi-square test.
PNC = prenatal care; ACE = adverse childhood experiences

References


Chapter 22: Household income

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of women (95% CI, N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household annual income during 12 months before delivery</td>
<td></td>
</tr>
<tr>
<td>$ 0 to $16,000</td>
<td>19.0 (16.2-21.7, 2005)</td>
</tr>
<tr>
<td>$16,001 to $28,000</td>
<td>13.4 (10.9-15.9, 1414)</td>
</tr>
<tr>
<td>$28,001 to $48,000</td>
<td>17.5 (14.7-20.2, 1845)</td>
</tr>
<tr>
<td>$48,001 to $73,000</td>
<td>19.1 (16.2-22.0, 2015)</td>
</tr>
<tr>
<td>$73,001 or more</td>
<td>31.1 (27.7-34.5, 3285)</td>
</tr>
<tr>
<td>Federal Poverty Level (FPL)</td>
<td></td>
</tr>
<tr>
<td>0-100%</td>
<td>28.7 (25.6-31.8, 3021)</td>
</tr>
<tr>
<td>101-150%</td>
<td>13.3 (10.8-15.8, 1403)</td>
</tr>
<tr>
<td>&gt;150%</td>
<td>58.0 (54.5-61.4, 6100)</td>
</tr>
</tbody>
</table>

PRAMS asked women:

Q76 During the 12 months before your new baby was born, what was your total household income before taxes? [List]

Q77 During the 12 months before your new baby was born, how many people, including yourself, depended on this income?

Definitions

Federal poverty level (FPL) is used to measure a household’s poverty status (1). Adjusted each year for inflation, the FPL can help determine if a family qualifies for certain government benefits, such as Medicaid; the Women, Infants and Children (WIC) program; food stamps; or funds for education.

Household Income at or below 100% of the Federal Poverty Level

Prevalence and Trends (Figure 22.1)

The percentage of South Dakota mothers whose household income was at or below 100% of the FPL has not changed (p-value for linear trend greater than 0.05).

Figure 22.1: Mothers whose household income was at or below 100% of the FPL by year, South Dakota, 2017-2018 (weighted)
Demographic Characteristics (Figure 22.2)
- Overall prevalence of South Dakota mothers whose household income was at or below 100% of the Federal Poverty Level (FPL) was 28.7%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with being at or below 100% of the FPL included maternal race, ethnicity, age, education, marital status, and region of the state that they resided.
- Mothers who were American Indian, Hispanic, younger, had less years of education, and not married had a higher prevalence of being at or below 100% of the FPL compared with their counterparts. Mothers who resided in the Pierre and Sturgis regions had the highest proportion of mothers at or below 100% of the FPL.

Risk Behaviors and Outcomes (Figure 22.3)
Mothers who had household incomes at or below 100% Federal Poverty Level, compared to mothers who had household incomes greater than 100% Federal Poverty Level, were significantly (p-value less than 0.05) more likely to report that:
- They were uninsured before pregnancy (26.9% vs. 7.2%).
- They smoked the three months before pregnancy (44.8% vs. 16.6%).
- They used illicit drugs the three months before pregnancy (17.6% vs. 5.1%).
- They were obese prior to pregnancy (28.9% vs. 21.1%).
- They started prenatal care after the first trimester or had no prenatal care (29.8% vs. 9.5%).
- They attended less than 80% of their prenatal visits (28.0% vs. 12.6%).
- They did not have their teeth cleaned during pregnancy (71.3% vs. 41.4%).
- They suffered emotional abuse during pregnancy (13.4% vs. 3.6%).
- They never breastfed their infant (18.2% vs. 3.5%).
- They had a high ACE score (4+) (39.8% vs. 15.7%).

Mothers who had household incomes at or below 100% Federal Poverty Level, compared to mothers who had household incomes greater than 100% Federal Poverty Level, were significantly (p-value less than 0.05) less likely to report that:
- They drank alcohol the 3 months before pregnancy (51.3% vs. 75.4%).
Figure 22.2: Percentage of mothers with a household income at or below 100% of the federal poverty level by demographic characteristics, South Dakota, 2018 (weighted)

** p-value < 0.01 based on Rao-Scott chi-square test.
++ p-value < 0.01 based on logistic regression results for linear trend.
Figure 22.3: Risk behaviors and outcomes by mothers with a household income at or below 100% of the Federal Poverty Level, South Dakota, 2018 (weighted)

- Not Insured Before Preg.**: 7.2% (Income greater than 100% FPL), 26.9% (Income at or below 100% FPL)
- Smoke 3-Mo. Before Preg.**: 16.6% (Income greater than 100% FPL), 44.8% (Income at or below 100% FPL)
- Alcohol 3-Mo. Before Preg.**: 51.3% (Income greater than 100% FPL), 75.4% (Income at or below 100% FPL)
- Illicit Drugs 3-Mo. Before Preg.**: 5.1% (Income greater than 100% FPL), 17.6% (Income at or below 100% FPL)
- Maternal Obesity Before Preg.*: 21.1% (Income greater than 100% FPL), 28.9% (Income at or below 100% FPL)
- Delayed or No PNC **: 9.5% (Income greater than 100% FPL), 29.8% (Income at or below 100% FPL)
- Attended <80% of PNC Visits**: 12.6% (Income greater than 100% FPL), 28.0% (Income at or below 100% FPL)
- Teeth Not Cleaned During Preg.**: 41.4% (Income greater than 100% FPL), 71.3% (Income at or below 100% FPL)
- Emotional Abuse During Pregnancy**: 3.6% (Income greater than 100% FPL), 13.4% (Income at or below 100% FPL)
- Never Breast-Fed **: 3.5% (Income greater than 100% FPL), 18.2% (Income at or below 100% FPL)
- ACE Score 4+ **: 15.7% (Income greater than 100% FPL), 39.8% (Income at or below 100% FPL)

References

Appendices

Healthy People 2020 Objectives & SD PRAMS
Demographics
Prevalence of Risk Factors
Response Rates
Methods
References
Questionnaire
## Healthy People 2020 Objectives and SD 2018 PRAMS data

<table>
<thead>
<tr>
<th>HP2020 Measure</th>
<th>Target Percentage</th>
<th>SD PRAMS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHS-1.1 Increase the proportion of persons with medical insurance.</td>
<td>100%</td>
<td>87%(^1)</td>
</tr>
<tr>
<td>FP-1 Increase the proportion of pregnancies that are intended.</td>
<td>56%</td>
<td>44%</td>
</tr>
<tr>
<td>IID-12.10: Increase the percentage of pregnant women who are vaccinated</td>
<td>80%</td>
<td>75%</td>
</tr>
<tr>
<td>against seasonal influenza.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IVP-39.1 Reduce physical violence by current or former intimate partners</td>
<td>-</td>
<td>2.6%(^2)</td>
</tr>
<tr>
<td>(developmental).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IVP-39.2 Reduce sexual violence by current or former intimate partners</td>
<td>-</td>
<td>1.3%(^2)</td>
</tr>
<tr>
<td>(developmental).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IVP-39.3 Reduce psychological abuse by current or former intimate partners</td>
<td>-</td>
<td>7.0%(^3)</td>
</tr>
<tr>
<td>(developmental).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICH-8.1 Reduce low birth weight births (&lt; 2,500 g).</td>
<td>7.8%</td>
<td>4.9%</td>
</tr>
<tr>
<td>MICH-8.2 Reduce very low birth weight births (&lt; 1,500 g).</td>
<td>1.2%</td>
<td>0.2%(^4)</td>
</tr>
<tr>
<td>MICH-9.1 Reduce overall preterm births.</td>
<td>9.4%</td>
<td>7.5%</td>
</tr>
<tr>
<td>MICH-9.2 Reduce live births at 34 to 36 weeks of gestation.</td>
<td>6.8%</td>
<td>5.3%(^5)</td>
</tr>
<tr>
<td>MICH-9.3 Reduce live births at 32 to 33 weeks of gestation.</td>
<td>1.1%</td>
<td>0.7%(^4) 28-33 weeks(^4)</td>
</tr>
<tr>
<td>MICH-9.4 Reduce very preterm or live births at less than 32 weeks of gestation.</td>
<td>1.5%</td>
<td>0.1%(^4) 28 weeks(^4)</td>
</tr>
<tr>
<td>MICH-10.1 Increase prenatal care beginning in the first trimester.</td>
<td>78%</td>
<td>83%</td>
</tr>
<tr>
<td>MICH-10.2 Increase early and adequate prenatal care.</td>
<td>78%</td>
<td>74%(^5)</td>
</tr>
<tr>
<td>MICH-11.1. Increase abstinence from alcohol among pregnant women.</td>
<td>98%</td>
<td>92%(^6)</td>
</tr>
<tr>
<td>MICH-11.3 Increase abstinence from smoking cigarettes during pregnancy.</td>
<td>99%</td>
<td>90%(^6)</td>
</tr>
<tr>
<td>MICH-11.4 Increase abstinence from illicit drugs among pregnant women.</td>
<td>100%</td>
<td>95%</td>
</tr>
<tr>
<td>MICH-16.1 Increase the proportion of women delivering a live birth who</td>
<td>27%</td>
<td>16%</td>
</tr>
<tr>
<td>discussed preconception health with a health care worker prior to pregnancy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICH-16.2 Increase the proportion of women delivering a live birth who took</td>
<td>33%</td>
<td>39%</td>
</tr>
<tr>
<td>multivitamins/folic acid daily prior to pregnancy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICH-16.3 Increase the proportion of women delivering a live birth who did</td>
<td>88%</td>
<td>73%(^7)</td>
</tr>
<tr>
<td>not smoke prior to pregnancy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICH-16.4 Increase proportion of women delivering a live birth who did not</td>
<td>56%</td>
<td>33%</td>
</tr>
<tr>
<td>drink alcohol prior to pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICH-16.5 Increase the proportion of women delivering a live birth who had</td>
<td>58%</td>
<td>47%</td>
</tr>
<tr>
<td>a healthy weight (BMI of 18.5-24.9) prior to pregnancy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICH-16.6 Increase the proportion of women delivering a live birth who used</td>
<td>59%</td>
<td>58%</td>
</tr>
<tr>
<td>a most effective or moderately effective contraception method postpartum.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICH-18 Reduce postpartum relapse of smoking among women who quit smoking</td>
<td>38%</td>
<td>46%</td>
</tr>
<tr>
<td>during pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICH-19 Increase the proportion of women giving birth who attend a postpartum</td>
<td>91%</td>
<td>89%</td>
</tr>
<tr>
<td>care visit with a health care worker.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICH-20 Increase the proportion of infants who are put to sleep on their back.</td>
<td>76%</td>
<td>87%</td>
</tr>
<tr>
<td>MICH-21.1 Increase the proportion of infants who are ever breastfed.</td>
<td>82%</td>
<td>92%</td>
</tr>
<tr>
<td>OH-10.2 Increase the proportion of children, adolescents and adults who used</td>
<td>49%</td>
<td>65%</td>
</tr>
<tr>
<td>the oral health care system in the past year.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TU-6 Increase smoking cessation during pregnancy</td>
<td>30%</td>
<td>63%</td>
</tr>
</tbody>
</table>


1 Before pregnancy; 2 during pregnancy; 3 emotional abuse; 4 singletons only; 5 based on Kotelchuck definition of adequacy (includes early initiation), includes adequate plus; 6 last 3 months of pregnancy; 7 two years before pregnancy

* Statewide estimates; green means at or better than HP 2020, while orange means worse by 10% or greater of HP 2020.
Demographics

The table below summarizes the demographic characteristics of the 2018 South Dakota eligible population and the participants.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Eligible % (N)</th>
<th>Survey % (95% CI, N)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number</td>
<td>11,210</td>
<td>1,017</td>
</tr>
<tr>
<td><strong>Maternal race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>71.7 (8,027)</td>
<td>71.7 (71.0-72.4, 428)</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>3.5 (394)</td>
<td>3.4 (2.8-4.1, 69)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5.7 (635)</td>
<td>5.5 (4.8-6.3, 135)</td>
</tr>
<tr>
<td>American Indian</td>
<td>13.3 (1,494)</td>
<td>12.5 (11.6-13.4, 228)</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>1.9 (214)</td>
<td>2.3 (1.9-2.8, 65)</td>
</tr>
<tr>
<td>Other/Mixed</td>
<td>3.9 (436)</td>
<td>4.6 (3.8-5.5, 89)</td>
</tr>
<tr>
<td><strong>Maternal age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 20</td>
<td>4.8 (534)</td>
<td>4.7 (3.4-6.5, 55)</td>
</tr>
<tr>
<td>20 – 24</td>
<td>19.7 (2,206)</td>
<td>18.5 (15.8-21.4, 195)</td>
</tr>
<tr>
<td>25 – 34</td>
<td>62.4 (6,998)</td>
<td>65.7 (62.3-69.0, 655)</td>
</tr>
<tr>
<td>35+</td>
<td>13.1 (1,472)</td>
<td>11.1 (9.0-13.6, 112)</td>
</tr>
<tr>
<td><strong>Maternal education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>14.4 (1,609)</td>
<td>13.5 (11.5-15.7, 191)</td>
</tr>
<tr>
<td>High school</td>
<td>24.5 (2,737)</td>
<td>22.9 (20.0-26.2, 227)</td>
</tr>
<tr>
<td>More than high school</td>
<td>61.1 (6,826)</td>
<td>63.6 (60.2-66.8, 593)</td>
</tr>
<tr>
<td><strong>Marital status at infant’s birth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>64.2 (7,199)</td>
<td>64.4 (61.1-67.6, 600)</td>
</tr>
<tr>
<td>Not married</td>
<td>35.8 (4,010)</td>
<td>35.6 (32.4-38.9, 417)</td>
</tr>
<tr>
<td><strong>Birthweight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low birth weight less than 2500 g</td>
<td>5.8 (649)</td>
<td>4.9 (3.6-6.5, 60)</td>
</tr>
<tr>
<td>Birthweight greater than 2500 g</td>
<td>94.2 (10,555)</td>
<td>95.1 (93.5-96.4, 956)</td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st birth</td>
<td>32.5 (3,645)</td>
<td>31.8 (28.5-35.2, 308)</td>
</tr>
<tr>
<td>2nd or later</td>
<td>67.5 (7,563)</td>
<td>68.2 (64.8-71.5, 709)</td>
</tr>
</tbody>
</table>

* Eligible population and survey percentages are not weighted for strata, non-coverage and/or non-response. Figures for population size and percent are compiled from state birth certificate data. All other figures are estimated from PRAMS sample. Survey sample sizes may not total n=1,017 if there were missing data.

** Maternal race stratum was based on allocated race. If multiple races were listed and one included American Indian, they were included under ‘Mixed’ in this table, but under American Indian in the race strata. For example, the number of mothers completing a survey and identified as American Indian (n=309) differs from the n=228 listed above due to American Indian mothers that are listed above under mixed race.
Prevalence of Risk Factors

The table below summarizes the statewide prevalence rates of the behavioral risk factors and outcomes that were investigated among South Dakota mothers in 2018.

<table>
<thead>
<tr>
<th>Risk Factor/Outcome</th>
<th>Prevalence (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unintended or mistimed pregnancy</td>
<td>40.0% (36.4-43.5)</td>
</tr>
<tr>
<td>Uninsured before pregnancy</td>
<td>13.1% (10.6-15.6)</td>
</tr>
<tr>
<td>Smoked 3 months before pregnancy</td>
<td>24.9% (21.8-28.0)</td>
</tr>
<tr>
<td>Drank 3 months before pregnancy</td>
<td>67.1% (63.9-70.3)</td>
</tr>
<tr>
<td>Used illicit drugs 3 months before pregnancy</td>
<td>8.6% (6.8-10.5)</td>
</tr>
<tr>
<td>Obese prior to pregnancy</td>
<td>23.1% (20.1-26.0)</td>
</tr>
<tr>
<td>Started prenatal care after first trimester or had no prenatal care</td>
<td>16.7% (14.0-19.4)</td>
</tr>
<tr>
<td>Attended less than 80% of prenatal visits</td>
<td>17.7% (15.2-20.1)</td>
</tr>
<tr>
<td>Did not have teeth cleaned during pregnancy</td>
<td>51.3% (47.7-54.9)</td>
</tr>
<tr>
<td>Suffered emotional abuse during pregnancy</td>
<td>7.0% (5.2-8.7)</td>
</tr>
<tr>
<td>Had diabetes, hypertension, or depression diagnosed during pregnancy</td>
<td>32.1% (28.7-35.4)</td>
</tr>
<tr>
<td>Had a cesarean section delivery</td>
<td>24.5% (21.4-27.7)</td>
</tr>
<tr>
<td>Infant was low birthweight (less than 2,500 g)</td>
<td>4.9% (3.5-6.3)</td>
</tr>
<tr>
<td>Infant was high birthweight (greater than 4000 g)</td>
<td>9.7% (7.6-11.8)</td>
</tr>
<tr>
<td>Infant was born preterm (less than 37 weeks)</td>
<td>7.5% (5.7-9.3)</td>
</tr>
<tr>
<td>Infant admitted to NICU</td>
<td>8.7% (6.7-10.7)</td>
</tr>
<tr>
<td>Never breastfed their infant</td>
<td>8.3% (6.5-10.2)</td>
</tr>
<tr>
<td>Infant does not sleep alone in the mother’s room</td>
<td>56.9% (53.3-60.6)</td>
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<tr>
<td>Baby is exposed to smoke</td>
<td>2.6% (1.5-3.8)</td>
</tr>
<tr>
<td>Mother had a high ACE score (4+)</td>
<td>22.2% (19.2-25.2)</td>
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## Summary of demographic factors associated with outcomes

<table>
<thead>
<tr>
<th>Demographics:</th>
<th>Maternal Race</th>
<th>Ethnicity</th>
<th>Maternal Age</th>
<th>Maternal Education</th>
<th>Marital Status</th>
<th>Annual Income</th>
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## Summary of risk factors associated with outcomes

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<tr>
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<td>Exercised 3+ days/week before preg.</td>
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<tr>
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<tr>
<td>Received flu shot</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Teeth cleaned</td>
<td>X</td>
<td>X</td>
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<tr>
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<td>X</td>
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<tr>
<td>Smoked before preg.</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
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<td>X</td>
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<tr>
<td>Ever breastfed</td>
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<tr>
<td>Breastfeeding at 2 months postpartum</td>
<td>X</td>
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<td>X</td>
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<td>Preterm birth</td>
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<tr>
<td>Put to sleep on back</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Sleeps on approved sleep surface</td>
<td></td>
<td>X</td>
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<tr>
<td>Sleeps without soft objects</td>
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<tr>
<td>Sleeps in own crib in mother’s room</td>
<td></td>
<td>X</td>
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<tr>
<td>Postpartum checkup</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
</tr>
<tr>
<td>Postpartum depression</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>High ACE score</td>
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<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No insurance before pregnancy</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below federal poverty level</td>
<td>X</td>
<td>X</td>
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</tr>
</tbody>
</table>

* Diabetes, hypertension or depression

LBW = low birth weight (<2,500 g); HBW = high birth weight (>4,000 g)
<table>
<thead>
<tr>
<th>Risk Behaviors &amp; Outcomes:</th>
<th>Preterm Birth</th>
<th>NICU Admission</th>
<th>Never Breast-Fed</th>
<th>Does Not Sleep Alone in Room w/Mother</th>
<th>Baby Exposed to Smoke</th>
<th>ACE Score 4+</th>
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</thead>
<tbody>
<tr>
<td><strong>Main Outcome Variables:</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Visited health care worker before preg</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Discussed preparing for healthy pregnancy before preg.</td>
<td>X</td>
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<tr>
<td>Exercised 3+ days/week before preg.</td>
<td></td>
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<tr>
<td>Intended pregnancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Vitamin daily before preg.</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Healthy weight before preg.</td>
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<tr>
<td>Gestational diabetes</td>
<td>X</td>
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<tr>
<td>Depression before preg.</td>
<td>X</td>
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<tr>
<td>Depression during preg.</td>
<td>X</td>
<td></td>
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<tr>
<td>Began PNC in first trimester</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Attended 80% or more of PNC visits</td>
<td>X</td>
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<tr>
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<td>X</td>
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<td>X</td>
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</table>
Response rate - aggregated data only

The final numbers and response rates for SD 2018 PRAMS are given below:

<table>
<thead>
<tr>
<th></th>
<th>Non-Hispanic White</th>
<th>American Indian</th>
<th>Other Races</th>
<th>Total</th>
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<tbody>
<tr>
<td>Final Eligible Births on Frame</td>
<td>8,027</td>
<td>1,910</td>
<td>1,273</td>
<td>11,210</td>
</tr>
<tr>
<td>Final Eligible Births Sampled</td>
<td>612</td>
<td>657</td>
<td>508</td>
<td>1,777</td>
</tr>
<tr>
<td>Non-response</td>
<td>184</td>
<td>429</td>
<td>219</td>
<td>760</td>
</tr>
<tr>
<td>Completed</td>
<td>428</td>
<td>309</td>
<td>280</td>
<td>1,017</td>
</tr>
<tr>
<td>Mail</td>
<td>369</td>
<td>176</td>
<td>207</td>
<td>752</td>
</tr>
<tr>
<td>Phone</td>
<td>59</td>
<td>133</td>
<td>73</td>
<td>265</td>
</tr>
<tr>
<td>Response Rate</td>
<td>70%</td>
<td>47%</td>
<td>55%</td>
<td>64.3%</td>
</tr>
</tbody>
</table>

# There were 11,210 eligible births (see SD 2018 Final Report from CDC).

^ Weighted percent response
Methods

Population and Sample

PRAMS is a population-based surveillance system developed by the CDC that is conducted by surveying mothers with infants between two and six months of age. The 2018 South Dakota PRAMS-like survey sample was derived from birth certificate data (stillbirths and fetal deaths were not included). The following exclusions were used when sampling 2018 births: mothers less than 14 years of age; out-of-state births to residents; in-state births to non-residents; missing key information (such as mother’s last name or mother’s mailing address); delayed processing of birth certificates (greater than 4 months after birth); all but one infant from twin and triplet births; all infants from multiple gestation births with plurality greater than 3; and adopted infants or surrogate births.

The sampling was stratified by the mother’s race, which was self-identified on the birth certificate, into three categories: white non-Hispanic race, American Indian race (includes mixed race if American Indian is indicated), and a category for all other races. Births within the race categories were randomly sampled each month at approximately 8% for white race, 35% for American Indian race, and 40% for the other races. American Indian and other race births were sampled at higher rates to ensure that adequate precision for prevalence estimates were available in these smaller populations. The total sample size, as recommended by CDC, was targeted to be approximately 1,200 completed surveys over one year (2018). Sampling rates by strata were based on the race distribution and numbers of births occurring in 2016 and adjusted for expected participation rates.

Questionnaire

The SD PRAMS questionnaire was based on the CDC phase 8 core PRAMS questionnaire. Mandatory items made up approximately 75% of the entire questionnaire. Optional items were selected to address the unique needs of South Dakota. The question selection process included extensive input from the South Dakota Department of Health and the PRAMS Steering Committee. The survey was available in both English and Spanish.

Collection of data

Mailings started about 2-4 months after delivery. Mail packets included a cover letter, questionnaire, stamped return envelope, calendar, informed consent information sheet, a picture of the thank-you gift, and resource guide. A two-dollar incentive was sent to all participants with the first questionnaire. Mothers who completed the questionnaire received a thank-you gift containing an insulated lunch bag, baby’s first touch-and-feel book, infant care grooming kit, and baby wipes. The SDSU PRAMS office sent data without personal identifiers to CDC for editing, weighting, and creation of the analysis file.

Response rate

The overall weighted response rate was 64%.

Sampling and weighting procedures

Samples of eligible women were drawn monthly beginning in April, 2018 and ending in April, 2019. The last batches allowed inclusion of births that were registered late to be included. Other than the last batch, which was small, batch size each month ranged from about 90 to 200.

In order for the survey results to be generalized to represent the population of all South Dakota women giving birth in 2018, a process of weighting was used. A weight can be interpreted as the number of women in the population that each survey respondent represents. For the SD PRAMS, three sample weights were calculated: sampling, non-response and non-coverage.

Sampling weights take into account the different sampling rates for the race strata and are the reciprocal of the sampling fraction applied to each stratum.
Non-response weights compensate for lower response rates among women with certain demographic characteristics, such as lower education, because women with these demographic characteristics are assumed to provide similar survey answers. Women with lower response rates are given higher non-response weights.

Non-coverage weights account for the omission from the survey of births that met eligibility requirements. The 2018 birth file was provided to CDC for comparison to the sampling frame to produce non-coverage weights. In 2018, no non-coverage weights were necessary. The sampling, non-response and non-coverage weights are multiplied to yield an analysis weight for each respondent.

This report was prepared using SAS (software v9.4) procedures that take into account sampling design and weighting.

Bias
Relying on mail and telephone for surveys may select mothers of higher socioeconomic status. Other potential sources of bias include observations with missing values, lack of control for confounding factors (see Introduction), and recall bias, because questions are asked regarding time periods of up to one year prior to pregnancy.

Confidence intervals, unstable data, significance
Confidence intervals, or margins of error, describe the range of possible percentages that could be observed for a particular measure among all women giving birth to a live infant. Though a point estimate (percentage) is provided, there remains a level of uncertainty around that estimate. The 95% confidence interval provides a measure of the uncertainty around the point estimate. The wider the confidence interval, the greater the uncertainty around the point estimate. For each measure in this report, the data tables present the low and high boundaries of the 95% confidence interval. The weighted frequency is also provided so that an idea of the total number of women affected is known.

Measures with too few respondents (less than 35 women) are not presented and measures with a relative standard error of 30% or greater yielded point estimates and confidence intervals considered to be unstable representations of the measure’s actual occurrence and are identified in the data tables.

Significance of associations were based on Rao-Scott chi-square test and ordinal demographic variables (age, education, income), as well as changes over time, were tested for linear trend using logistic regression.

Measures
Kotelchuk Index. Also called the Adequacy of Prenatal Care Use Index, the Kotelchuck Index uses two birth certificate elements to classify adequacy of prenatal care (1). Timing of initiation of prenatal care, assuming earlier is better, and number of prenatal care visits, compared against an expected number of visits based on the American College of Obstetricians and Gynecologists’ standards for an uncomplicated pregnancy.

The two dimensions of initiation and number of visits are combined into a summary measure. Inadequate care is defined as prenatal care begun after the 4th month or under 50% of expected visits were received. Intermediate care is defined as prenatal care begun by month 4 and between 50-79% of expected visits were received. Adequate care is defined as prenatal care begun by month 4 and 80-109% of expected visits were received. Adequate plus (intensive) care is defined as prenatal care begun by month 4 and 110% or more of expected visits were received (1). The Kotelchuck Index does not measure quality or content of care, and it also may not measure adequacy of prenatal care for women with high-risk pregnancies.

Body Mass Index. Body mass index (BMI) is a commonly used measure of the relationship between weight and height that approximates body fat (BMI formula = weight (kg) / [height (m)]^2). Pre-pregnancy BMI values were calculated based on information provided on the birth certificate.
In this report, BMI results based on the National Heart, Blood, and Lung Institute (NHBLI) definitions: underweight (less than 18.5); healthy weight (18.5 to less than 25); overweight (25 to less than 30); and obese (30 or over). The NHBLI presented BMI categories in a 1998 report focused on evidence-based assessment and treatment of overweight and obesity in adults (2). The NHBLI categories are commonly used in primary care settings. The NHBLI uses BMI-for-age percentile for children and youth and takes into account growth patterns of children and differences between girls and boys. For children and adolescents (aged 2-19 years): overweight is defined as a BMI at or above the 85th percentile and lower than the 95th percentile for children of the same age and sex, and obesity is defined as a BMI at or above the 95th percentile for children of the same age and sex (3).

References
Questionnaire