South Dakota 2020 PRAMS Surveillance Data Report

SOUTH DAKOTA DEPARTMENT OF HEALTH

JANUARY 2022

Introduction

Quotes from 2020 SD PRAMS mothers:

"I loved this survey."

"My experience was amazing and the joy of being a mother is amazing!"

"This is a great program! ☺."

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.

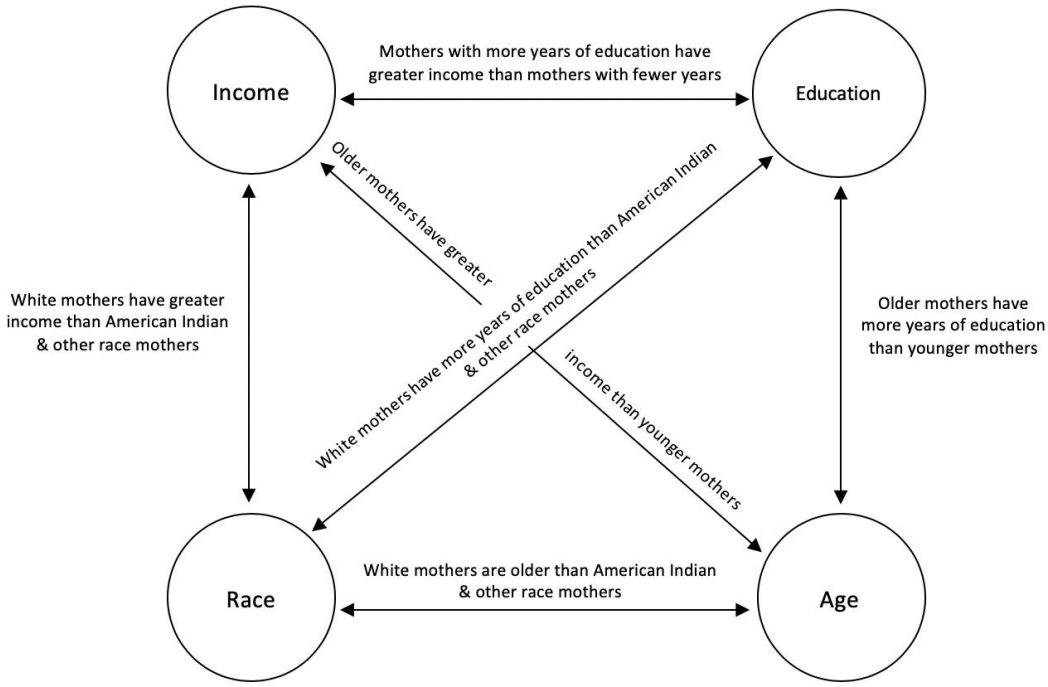
The CDC established the PRAMS in 1987 to obtain information about maternal behavior and experiences that may be associated with adverse birth outcomes. The survey is disseminated to women who have recently given birth to live-born infants. In 2020, 46 states (including South Dakota), New York City, Northern Mariana Islands, Puerto Rico, and the District of Columbia participated in PRAMS.

A random sample of South Dakota residents who delivered a live-born infant in 2020 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 2020 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, 2018, 2019 and 2020 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.

References

1. Specker BL, Wey HE, Minett M, Beare TM. Pregnancy survey of smoking and alcohol use in South Dakota American Indian and white mothers. *American Journal of Preventive Medicine* 55:89-97, 2018.

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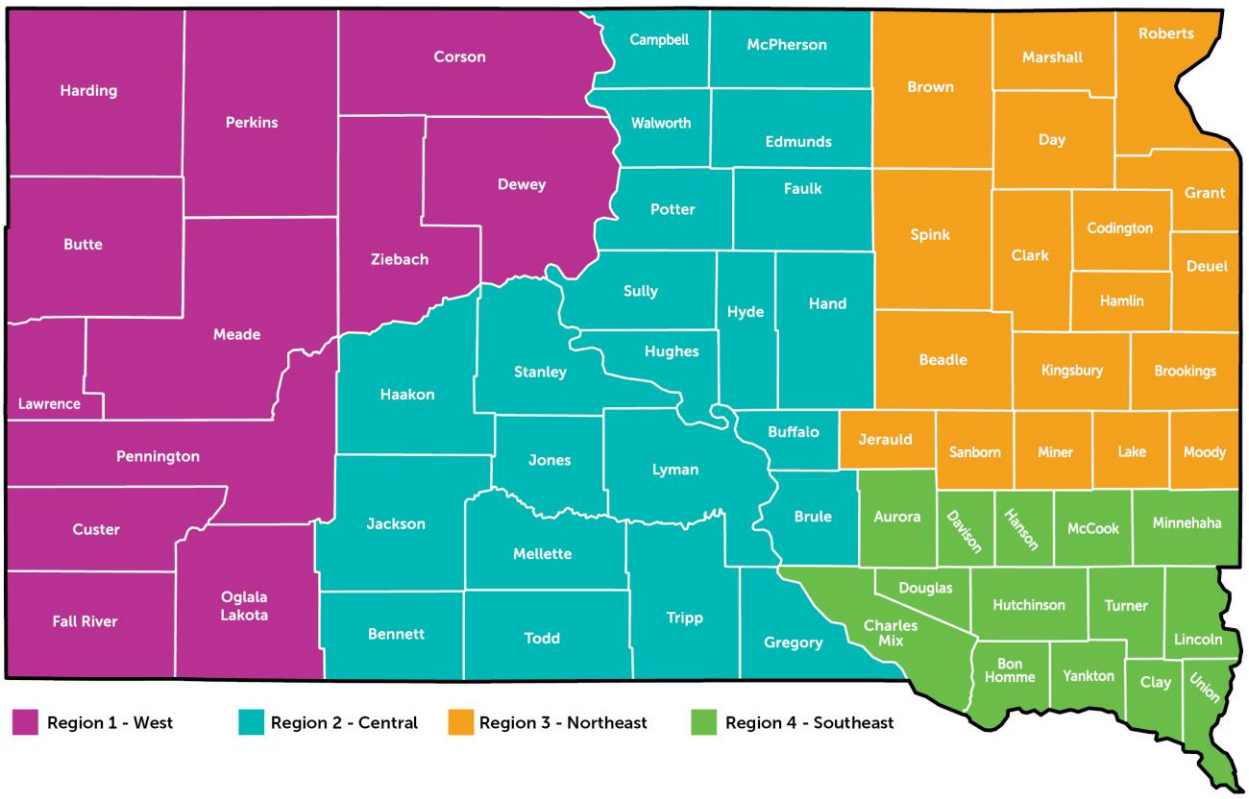
Map of health regions of South Dakota:



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 2020 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

- 66% of mothers visited a health care worker the 12 months *before* pregnancy.
- 25% 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 Healthy People 2020 target is 27%.

Preconception health

- 42% 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 (30%), dieting to lose weight (30%), regularly taking prescription medicines other than birth control (25%) and being checked for diabetes (12%).
- Among women with a previous birth, 16% had their current infant within 18 months of the previous child.

Pregnancy intention & birth control use

- 56% of mothers had an intended pregnancy (were trying to get pregnant). The Healthy People 2020 target is 56%.
- Among women who were not trying to get pregnant, 63% were not using birth control at conception.

Nutrition & weight

- 41% of mothers were taking a vitamin daily the *month before pregnancy.* The Healthy People 2020 target is 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 (62%) and she did not think she needed vitamins (39%).
- 42% of mothers had a healthy body mass index before pregnancy.
- 56% of South Dakota mothers had overweight or obesity.

Medical risk factors (depression and gestational diabetes)

- 18% of mothers reported having depression the *three months before pregnancy.*
- 17% of mothers reported having depression *during pregnancy*.
- 13% of mothers had gestational diabetes.

Prenatal care: entry, adequacy, and barriers

- 86% 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. The Healthy People 2020 target is 78%.
- 75% of mothers received adequate or greater than adequate prenatal care based on the Kotelchuck Index.
- Among women who received prenatal care, 90% started prenatal care as early as they wanted.
- The top two reasons mothers reported for not getting prenatal care or not getting prenatal care as early as they wanted included not knowing they were pregnant (39%) and that they had too many other things going on (28%).
- Among women who received prenatal care, 94% self-reported going to all their recommended prenatal visits.

- The top two barriers among women who received prenatal care and were not able to attend all their recommended visits included 'other' reasons (46%; many written responses included COVID) and not having transportation to get to the clinic or office (33%).

Flu vaccinations

- 76% of mothers received a flu vaccine the *12 months before the delivery* of the infant (15% before pregnancy and 61% during pregnancy). The Healthy People 2020 recommendation is 80%.

Oral health

- 42% 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 (18%) and not thinking it was safe to go to the dentist during pregnancy (13%).

Abuse

- Less than 2% of mothers reported being physically abused before and during pregnancy by their partner or husband.
- Less than 1% of mothers reported being sexually abused during pregnancy by their partner or husband.
- 5% of mothers were emotionally abused during pregnancy.

Tobacco, quit status and infant environmental smoke exposure

- 19% of mothers smoked the *three months before pregnancy*. The Healthy People 2020 target is 12%.
- 9% of mothers smoked the *last three months of pregnancy.* The Healthy People 2020 target is 1%.
- Among mothers who smoked the *three months before pregnancy*, 60% quit smoking before or during pregnancy and 80% were advised by their health care provider to quit smoking.
- Among mothers who smoked the *three months before pregnancy*, the top two barriers to quitting included cravings for a cigarette (69%) and other people smoking around her (60%).
- Among mothers who smoked prior to pregnancy and quit during pregnancy, the relapse rate (restarted smoking at the time the survey was completed) was 38%. The Healthy People 2020 target is 38%.
- 9% of mothers used e-cigarettes or other electronic nicotine products in the *two years before pregnancy*.
- 99% of mothers stated that their infant was not in an enclosed space with someone who smoked in the previous week.

Alcohol & Drug Use

- 66% of mothers drank in the *three months before pregnancy*. The Healthy People 2020 target is 44%.
- Among women who drank in the *three months before pregnancy*, 41% drank four alcoholic drinks or more in a 2-hour time span (binge drinking) at least one time.
- 13% of mothers drank the *last three months of pregnancy.* The Healthy People 2020 target is 2%.
- 12% of mothers used an illicit drug *before* pregnancy.
- 7% of mothers used an illicit drug *during* pregnancy.
- 10.3% of mothers used marijuana or has *before* pregnancy.
- 5.9% of mothers used marijuana or hash *during* pregnancy

Breastfeeding

- 90% of mothers ever breastfed. The Healthy People 2020 target is 82%.
- 74% of mothers breastfed at least two months.
- Mothers reported that the two most common sources of information about breastfeeding included the mother's doctor (79%) and a nurse, midwife, or doula (73%).
- The top two reasons for stopping breastfeeding included the mother thinking she was not producing enough milk, or milk dried up (55%) and baby had difficulty latching or nursing (35%).

Infant health

- 9% of all mothers had a preterm birth. The Healthy People 2020 target is 9.9%.
- 8.3% of mothers had a singleton infant that was born preterm.
- 5.8% of mothers had a singleton infant with a low-birth-weight infant (< 2,500 grams).

- 72% of infants stayed in the hospital two days or less following birth.

Infant safe sleep

- 88% of mothers *placed their infant on his or her back to sleep*. The Healthy People 2020 target is 76%.
- 40% of mothers *placed their infants on a HRSA-approved sleep surface*.
- 56% of mothers most often *laid their infant to sleep without soft objects or loose bedding*.
- 48% of mothers' *infants room-shared without bed-sharing*.

Postpartum health and birth control use

- 87% of mothers attended a postpartum visit. The Healthy People 2020 target is 91%.
- 13% of mothers had indications of postpartum depression.
- Among women who were not pregnant or trying to get pregnant *at the time of the survey*, 19% were not using contraceptives, 26% were using the least effective contraceptives, 26% were using moderately effective contraceptives, and 29% 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 (52%) and being worried about side effects from birth control (32%).

Adverse Childhood Experiences (ACEs)

- 22% of mothers had a high ACE score (4+).

Health insurance

- 14% of mothers were uninsured *before pregnancy*.
- 3% of mothers were uninsured *during pregnancy* and 10% of mothers had no insurance *after the delivery*.

Household income and poverty

- 30% of mothers had household incomes at or below 100% of the Federal Poverty Level (FPL).

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Organizations

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Data Tables

Chapter 1: Preconception care

Measure	% of women (95% CI, N)
Preconception care	
Visited a health care worker the 12 months before pregnancy	66.4 (63.2-69.6, 6854)
Visited a health care worker the 12 months before pregnancy *and* talked about preparing for a healthy pregnancy	24.6 (20.7-28.5, 1656)
A*mong those women* who visited a health care worker the 12 months before pregnancy, the visit was a:	
Regular checkup at family doctor's office	39.0 (34.6-43.3, 2694)
Regular checkup at OB/GYN office	44.9 (40.4-49.4, 3108)
Visit for an illness or chronic condition	17.3 (13.9-20.8, 1200)
Visit for an injury	3.8 (2.1-5.4, 261)
Visit for family planning or birth control	18.0 (14.5-21.4, 1243)
Visit for depression or anxiety	15.0 (11.7-18.3, 1038)
Visit to have teeth cleaned by a dentist or dental hygienist	65.1 (60.8-69.3, 4503)
***Among those women* who visited a health care worker the 12 months before pregnancy, the healthcare provider: preconception care topics included:**	
Told to take a vitamin with folic acid	33.9 (29.6-38.2, 2295)
Talked about maintaining a healthy weight	32.9 (28.6-37.2, 2234)
Talked about controlling any medical conditions such as diabetes or high blood	9.2 (6.7-11.7, 623)
Talked about desire to have or not have children	38.0 (33.6-42.4, 2587)
Talked about using birth control to prevent pregnancy	37.8 (33.4-42.2, 2560)
Talked about improving health before pregnancy	24.6 (20.7-28.5, 1656)
Talked about sexually transmitted infections such as chlamydia, gonorrhea, or	23.3 (19.5-27.1, 1569)
Asked about smoking cigarettes	75.0 (71.0-79.0, 5108)
Asked if someone was hurting them emotionally or physically	61.1 (56.7-65.6, 4152)
Asked if they were feeling down or depressed	64.4 (60.0-68.7, 4397)
Asked about the kind of work they did	64.9 (60.6-69.2, 4448)
Tested for HIV (the virus that causes AIDS)	16.6 (13.4-19.7, 1119)

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

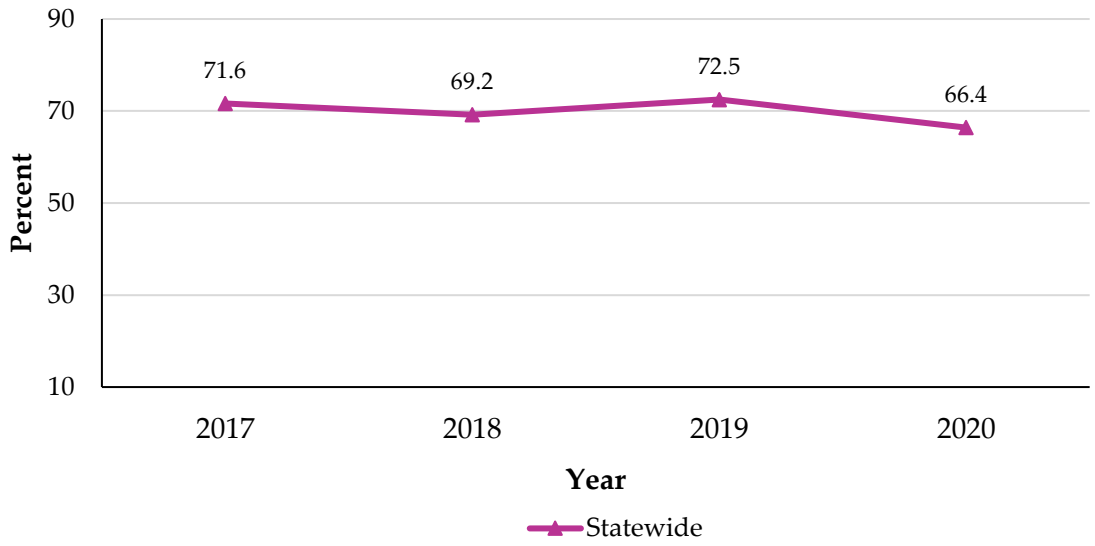
- **MICH-16.1** Increase the proportion of women delivering a live birth who discussed preconception health with a health care worker prior to pregnancy to 27%.

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 over time (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, 2017–2020 (weighted)



Demographic Characteristics (Figure 1.2)

- Overall prevalence of South Dakota mothers who visited a health care worker the *12 months before* pregnancy was 66.4%.
- 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, and household income.
- 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.

Risk Behaviors and Outcomes (Figure 1.3)

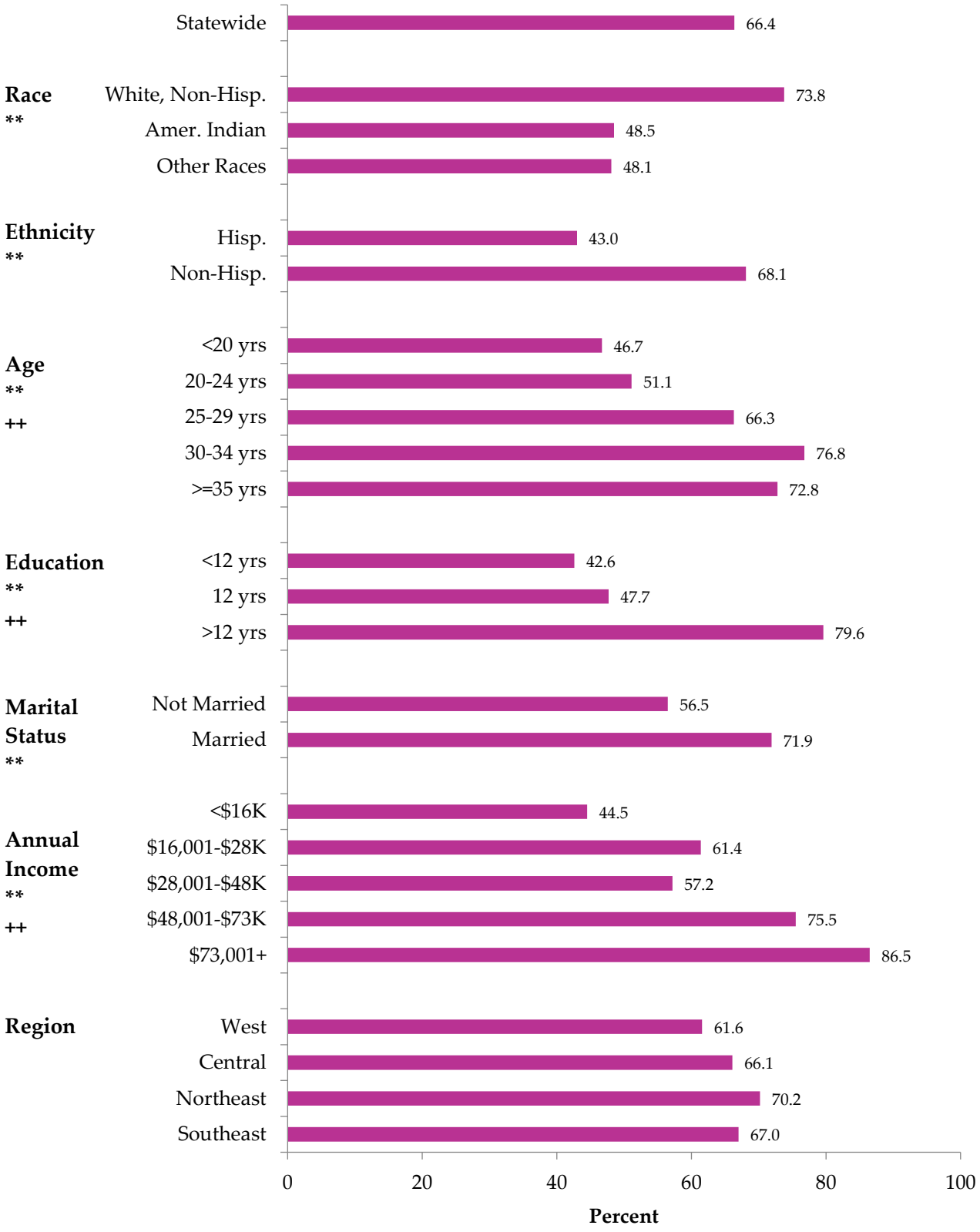
Mothers who visited a health care worker the *12 months before* pregnancy, compared to mothers who *did not* visit a health care worker, were significantly (p-value less than 0.05) *more likely* to report that:

- They drank alcohol the 3 months before pregnancy (72.8% vs. 52.7%).
- Their baby is exposed to smoke (1.9^% vs. 0.4%^); interpret these percentages with caution).

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 (7.4% vs. 27.9%).
- They started prenatal care after the first trimester or had no prenatal care (8.1% vs. 26.8%).
- They attended fewer than 80% of their prenatal visits (13.0% vs. 27.6%).
- They did not have their teeth cleaned during pregnancy (47.9% vs. 78.6%).
- They suffered emotional abuse during pregnancy (3.7% vs. 7.3%).
- They never breastfed their infant (8.1% vs. 14.4%).

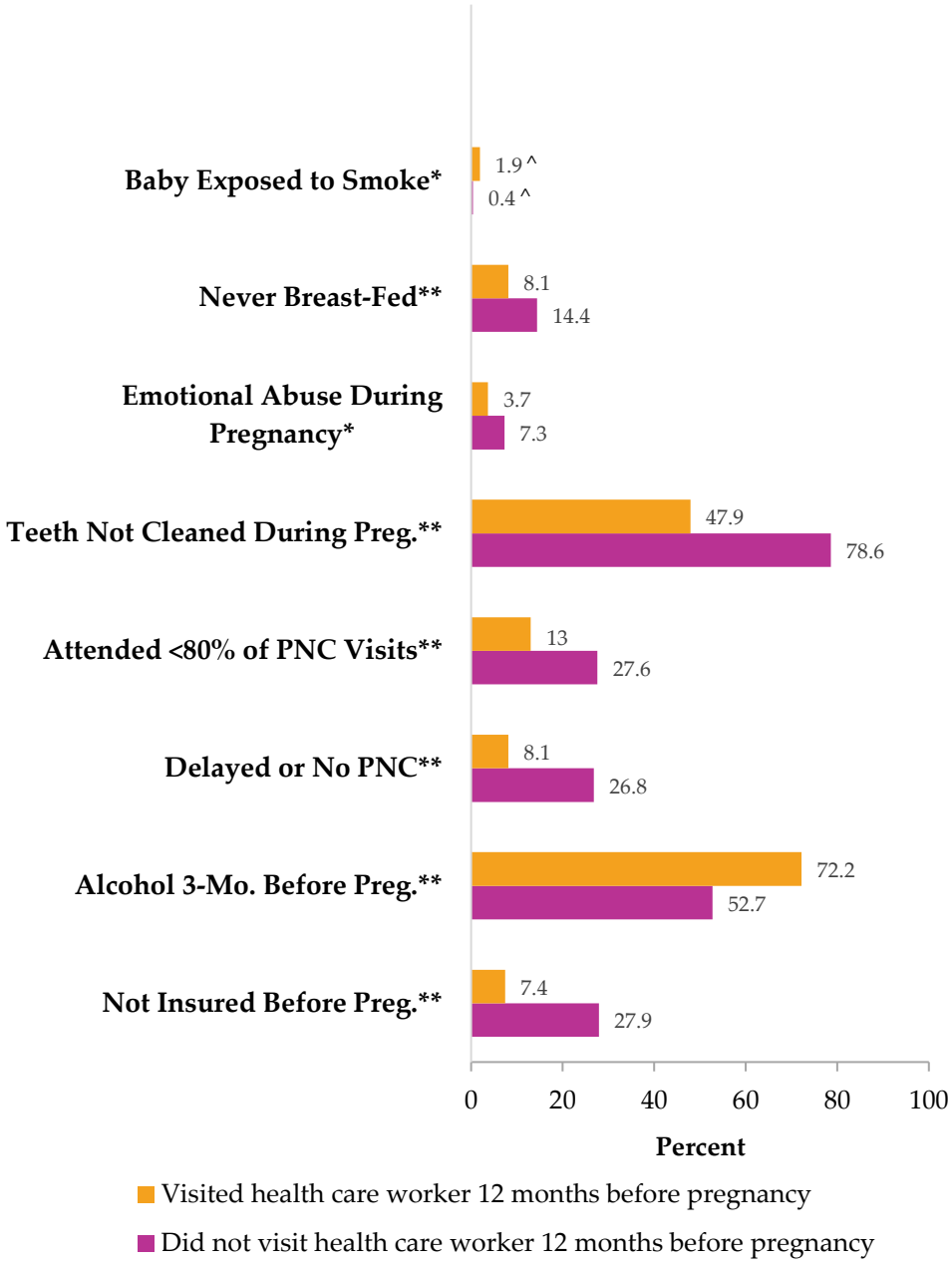
Figure 1.2: Percentage of mothers who visited a health care worker the 12 months before pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



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

++ p-value <0.01, based on logistic regression results for linear trend

Figure 1.3: Significant risk behaviors and outcomes by mother visiting a health care worker the 12 months before pregnancy, South Dakota, 2020 (weighted)



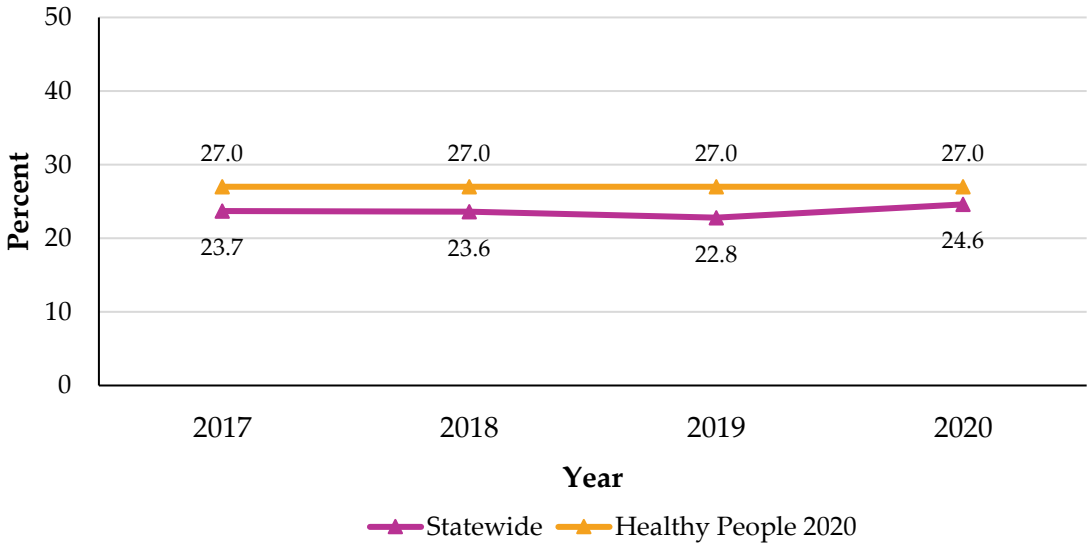
* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care

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 over time (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, 2017–2020 (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 healthcare worker about improving their health before pregnancy was 24.6%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with talking with a health care worker about improving health before pregnancy included maternal education, household income and region of the state that they resided.
- Mothers who had a higher education level, and higher household income had a higher prevalence of talking to a healthcare worker about improving their health before pregnancy. Mothers who resided in the Central health region had the highest prevalence of mothers who talked with a healthcare worker about improving their health before pregnancy.

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:

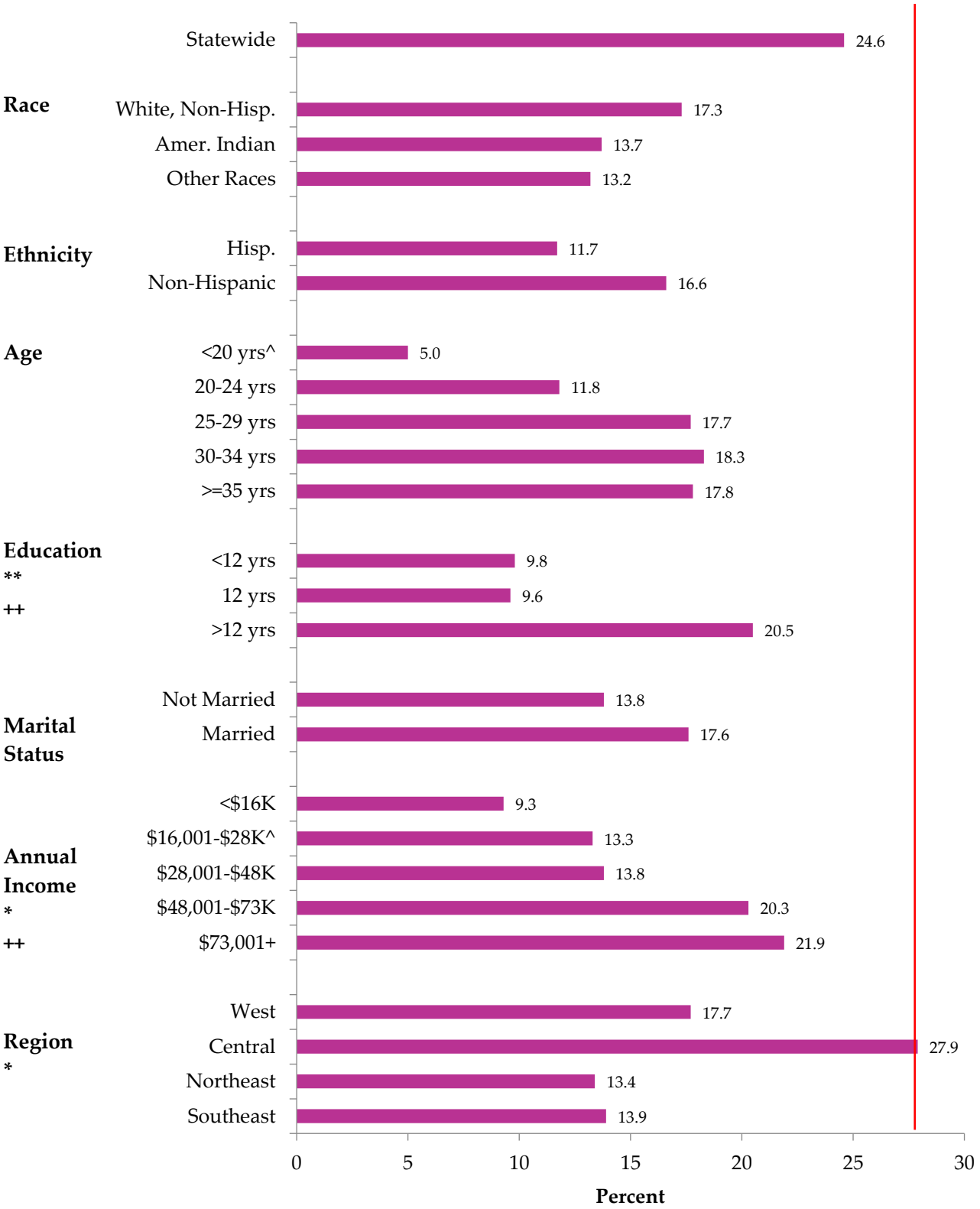
- They had obesity before pregnancy (37.7% vs. 26.1%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (45.2% vs. 34.8%).
- They had a cesarean section (33.2% vs. 22.6%).

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) *less likely* to report that:

- They were not insured before pregnancy (3.4^% vs. 16.6%; interpret these percentages with caution).

- They started prenatal care after first trimester or had no prenatal care (4.7^% vs. 16.2%; interpret these percentages with caution).
- They attended fewer than 80% of prenatal visits (8.7% vs. 19.4%).
- They did not have teeth cleaned during pregnancy (49.6% vs. 60.3%).

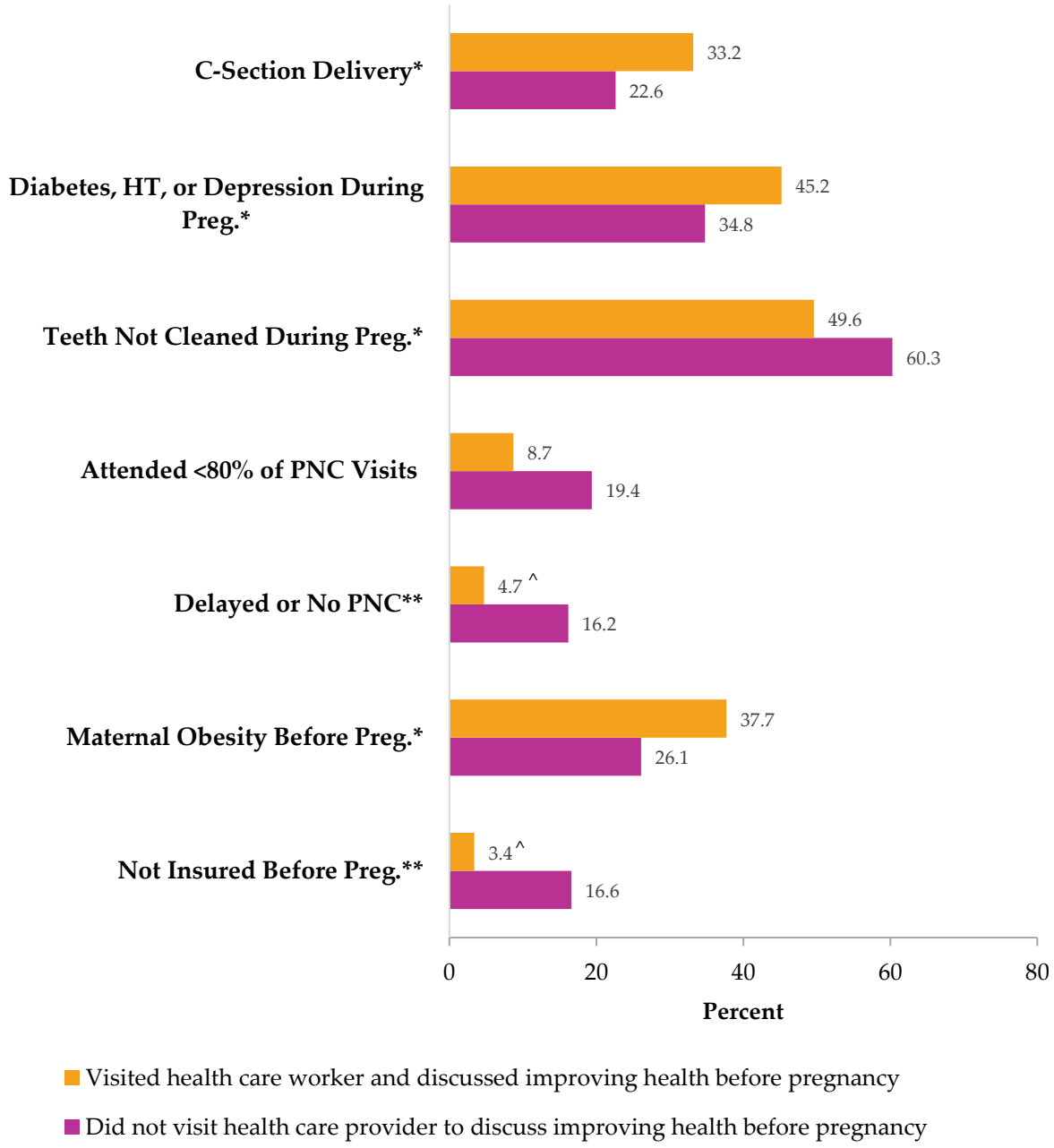
Figure 1.5: Percentage of mothers who visited a health care worker the 12 months before pregnancy and talked with health care worker about improving health before pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



* 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.
^ 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, 2020 (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).

References

1. Floyd RL, Johnson KA, Owens JR, Verbeist S, Moore CA, Boyle C. A national action plan for promoting preconception health and health care in the United States (2012-2014). *Journal of Womens Health* 22(10):797-802, 2013

2. Robbins CL, Zapata LB, Farr SL, Kroelinger CD, Morrow B, Ahluwalia I, D'Angelo DV, Barradas D, Cos S, Goodman D, Williams L, Grigorescu V, Barfield WD. Core state preconception health indicators - pregnancy risk assessment monitoring system and behavioral risk factor surveillance system, 2009. *MMWR Surveillance Summary 63:1-62*, 2014.

Chapter 2: Preconception health

Measure	% of women (95% CI, N)	
Health-related activities done during the *12 months before* pregnancy		
Was exercising 3 or more days/week for fitness outside of regular job	42.3	(38.7-45.8, 4357)
Talked to a health care worker about family medical history	30.1	(26.8-33.4, 3096)
Was dieting to lose weight	30.4	(27.0-33.7, 3137)
Was regularly taking prescription medicines other than birth control	24.5	(21.3-27.6, 2525)
Was checked for diabetes	12.1	(10.0-14.1, 1236)
Among women who had a previous birth, age difference between last child and most recent baby		
0 to 12 months	4.7	(2.9-6.5, 320)
13 to 18 months	11.5	(8.7-14.2, 778)
19 to 24 months	19.4	(15.9-23.0, 1319)
2 to 3 years	24.0	(20.3-27.7, 1626)
3 to 5 years	24.4	(20.7-28.1, 1656)
More than 5 years	16.0	(12.9-19.1, 1084)

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:

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]

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

Healthy People 2020 Objective

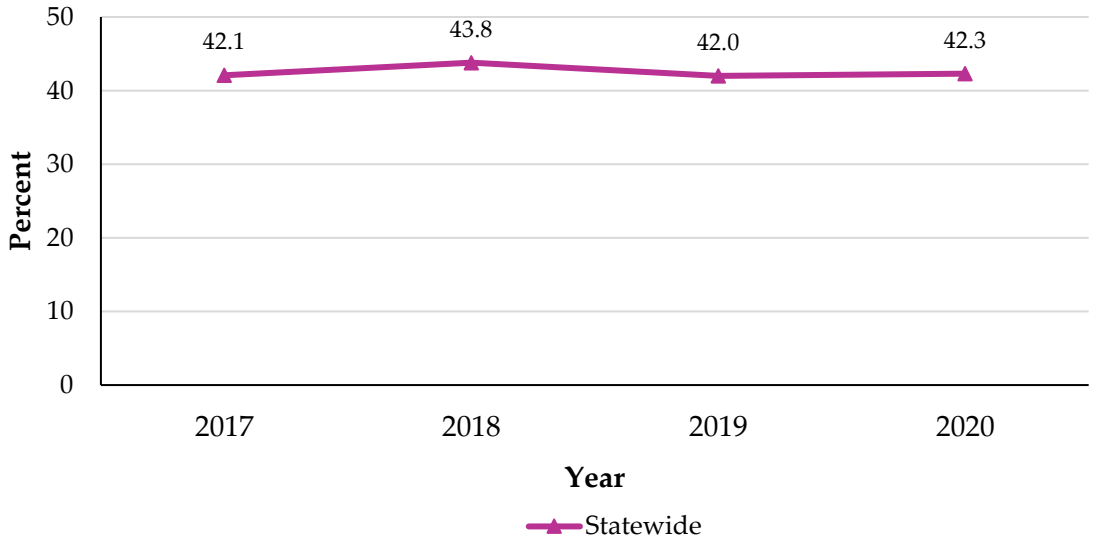
- MICH-16 Increase the proportion of women delivering a live birth who received preconception care services and practiced key recommended preconception health behaviors.

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 over time (p-value for linear trend greater than 0.05).

Figure 2.1: Mothers who were exercising three or more days/week for fitness the 12 months before pregnancy by year, South Dakota, 2017–2020 (weighted)



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 42.3%.
- 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, age, education, marital status, and household income.
- Mothers who were white, 35 years and older, had more years of education, were married, and had greater household income 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)

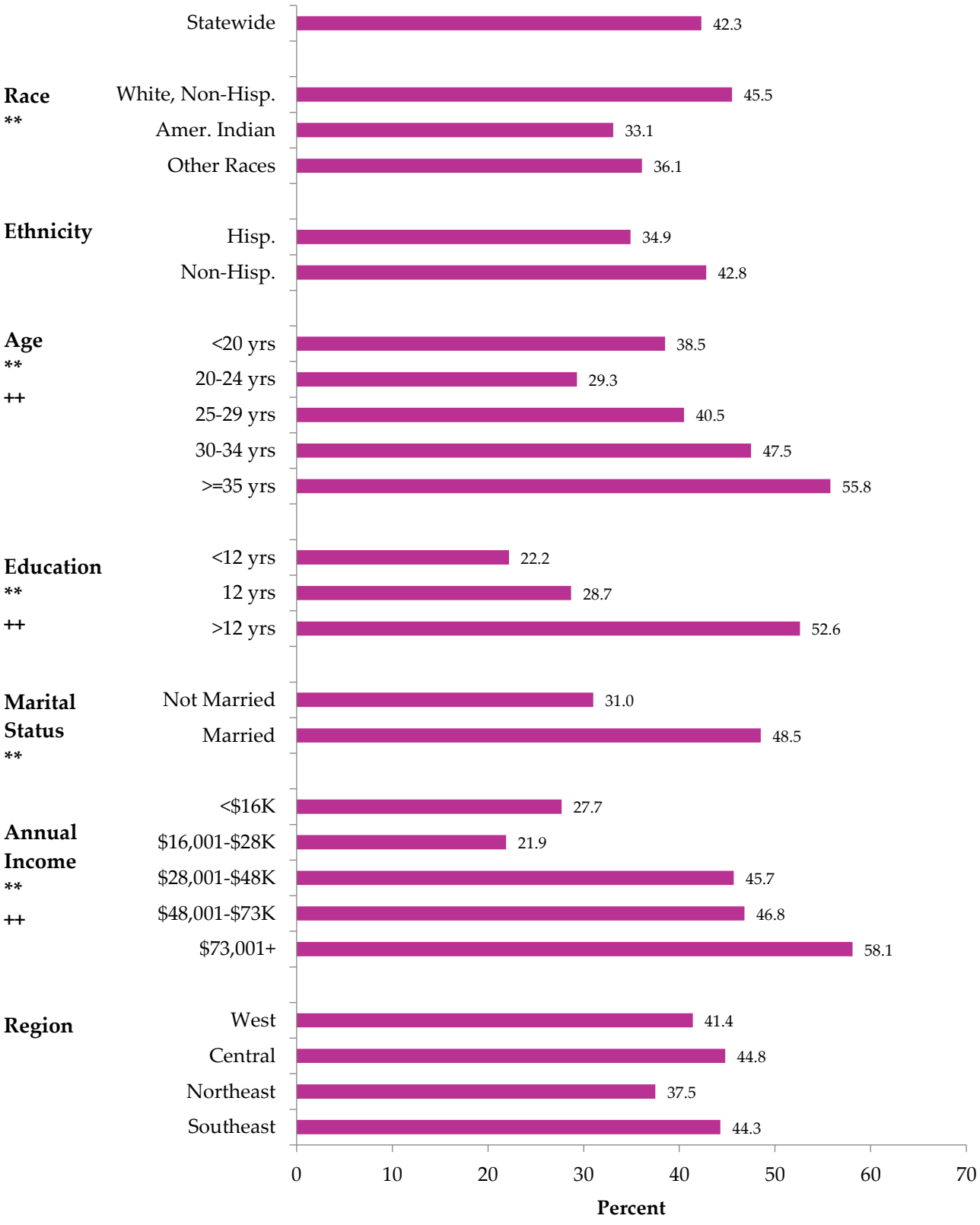
Mothers who exercised 3 or more days of the week, compared to mothers who did not exercise 3 or more days of the week, were significantly (p-value less than 0.05) *more likely* to report that:

- They drank alcohol the 3 months before pregnancy (70.9% vs. 61.6%).
- Their baby is exposed to smoke (2.6^% vs. 0.5%^); interpret these percentages with caution).

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:

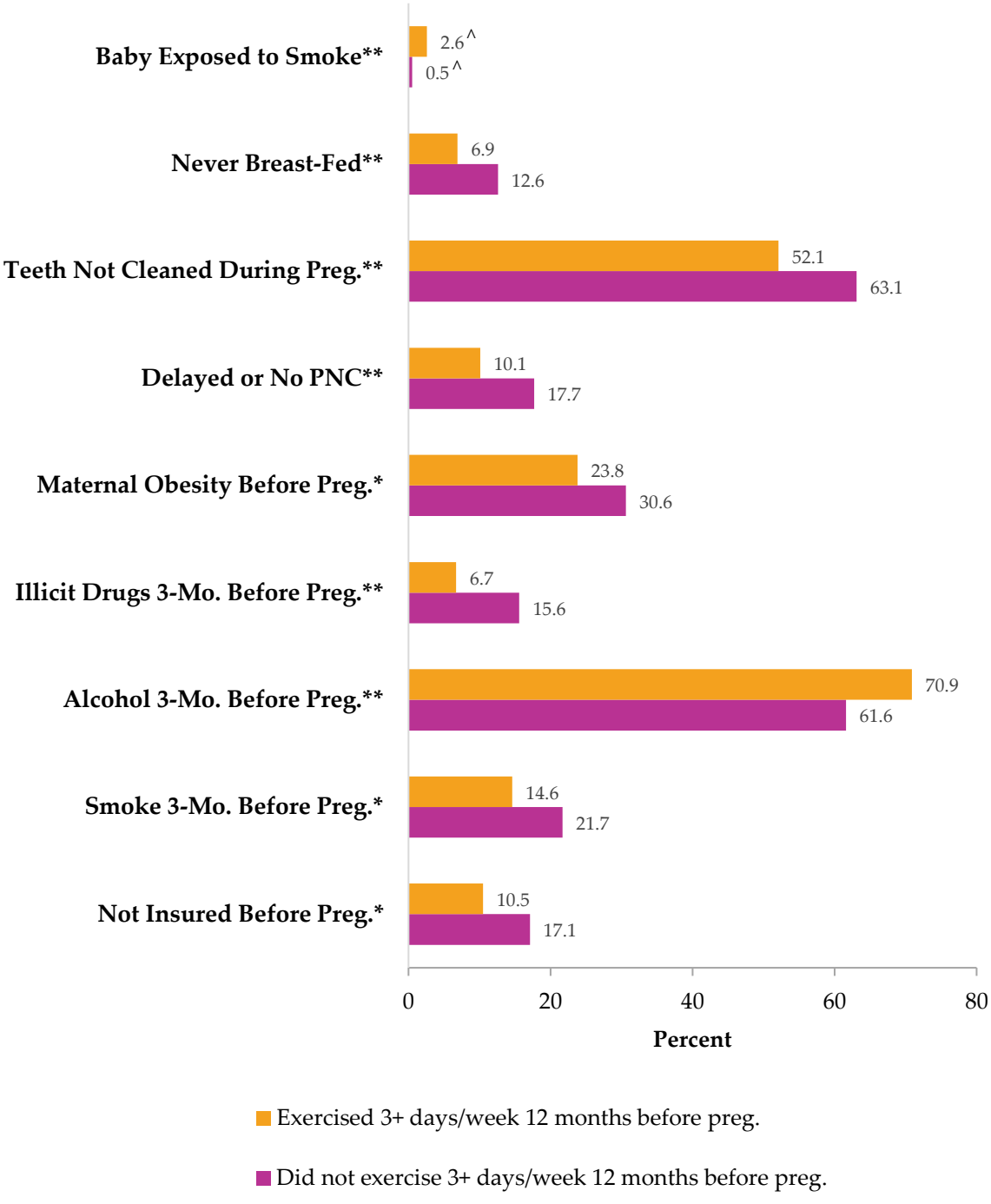
- They were not insured before pregnancy (10.5% vs. 17.1%).
- They smoked the 3 months before pregnancy (14.6% vs. 21.7%).
- They used illicit drugs the 3 months before pregnancy (6.7% vs. 15.6%).
- They had obesity before pregnancy (23.8% vs. 30.6%).
- They started prenatal care after the first trimester or had no prenatal care (10.1% vs. 17.7%).
- They did not have their teeth cleaned during pregnancy (52.1% vs. 63.1%).
- They never breastfed their infant (6.9% vs. 12.6%).

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, 2020 (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 2.3: Risk behaviors and outcomes by mothers who exercised three or more days per week the 12 months before pregnancy, South Dakota, 2020 (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).

References

1. Floyd RL, Johnson KA, Owens JR, Verbeist S, Moore CA, Boyle C. A national action plan for promoting preconception health and health care in the United States (2012-2014). *Journal of Womens Health* 22(10):797-802, 2013

2. Schummers L, Hutcheon JA, Hernandez-Diaz S. Association of short interpregnancy interval with pregnancy outcomes according to maternal age. Journal of the American Medical Association 178:1661-1670, 2018.

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

Measure	% of women (95% CI, N)
Maternal intention and timing of pregnancy	
Later (*mistimed*)	18.7 (15.9-21.6, 1937)
Sooner (*mistimed*)	17.0 (14.2-19.7, 1755)
Then (*intended*)	40.4 (36.9-43.9, 4172)
Did not want then or in the future (*unintended*)	6.4 (4.8-8.0, 662)
Was not sure (*unsure*)	17.5 (14.8-20.1, 1804)
Women who were trying to get pregnant at conception	56.0 (52.5-59.5, 5786)
Among women who were not trying to get pregnant, those who were not using birth control at conception	63.0 (57.9-68.1, 2868)

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 *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

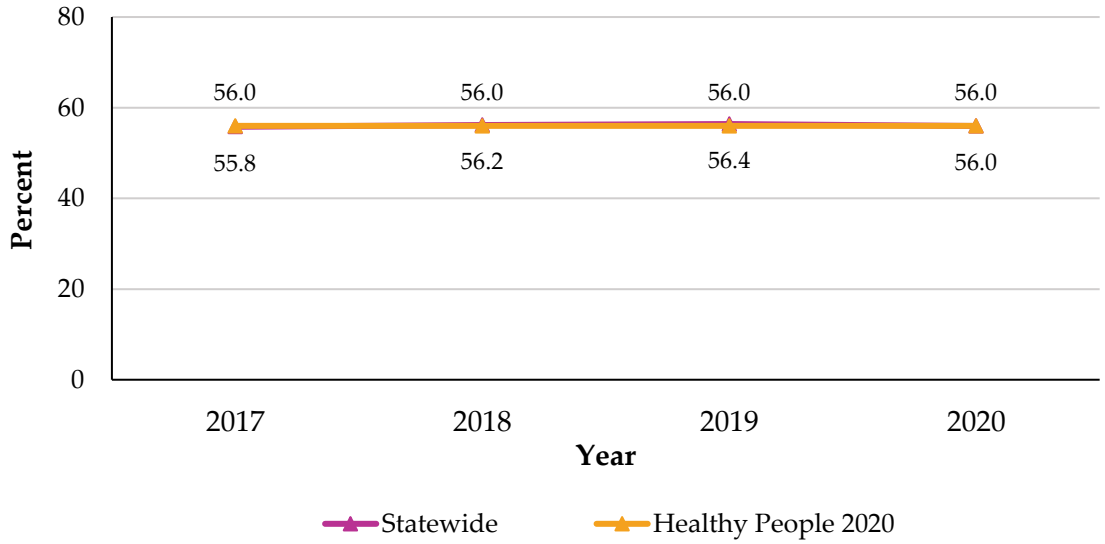
- **FP-1** Increase the proportion of pregnancies that are intended to 56%.

Intended Pregnancy

Prevalence and Trends (Figure 3.1)

The percentage of South Dakota mothers who had an intended pregnancy (were trying to get pregnant) has not changed over time (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 56% was achieved in 2018, 2019 and 2020.

Figure 3.1: Mothers who had an intended pregnancy by year, South Dakota, 2017-2020 (weighted)



Demographic Characteristics (Figure 3.2)

- Overall prevalence of South Dakota mothers who had an intended pregnancy (were trying to get pregnant) was 56.0%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with having an intended pregnancy included maternal race, ethnicity, age, education, marital status, household income and region of the state that they resided.
- Mothers who were white, non-Hispanic, between 30-34 years of age, had more years of education, were married, and had greater household income had a higher prevalence of having an intended pregnancy compared with their counterparts. Mothers who resided in the Southeast health region had the highest proportion of who had an intended pregnancy.

Risk Behaviors and Outcomes (Figure 3.3)

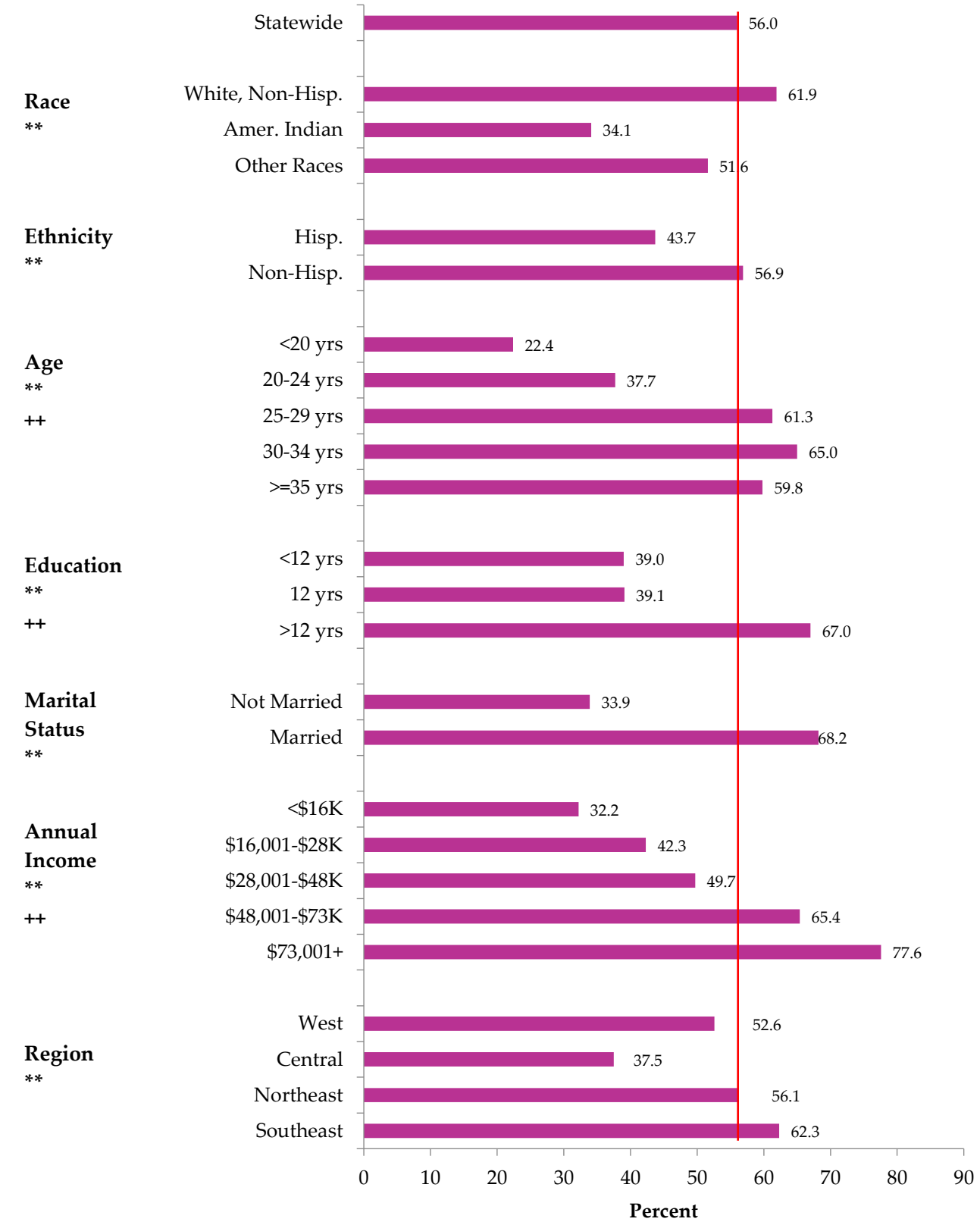
Mothers who had an intended pregnancy, compared to mothers who did not have an intended pregnancy, were significantly (p-value less than 0.05) *more likely* to report that:

- They drank alcohol 3 months before pregnancy (68.9% vs 61.7%)
- They had a cesarean section (28.4% vs. 18.6%)

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 (10.1% vs. 19.8%).
- They smoked the 3 months before pregnancy (10.7% vs. 29.3%).
- They used illicit drugs the 3 months before pregnancy (5.7% vs. 19.6%).
- They started prenatal care after the first trimester or had no prenatal care (9.9% vs. 20.1%).
- They attended fewer than 80% of their prenatal visits (14.7% vs. 21.6%).
- They did not have their teeth cleaned during pregnancy (51.1% vs. 67.5%).
- They suffered emotional abuse during pregnancy (1.2^% vs. 9.5%; interpret these percentages with caution)
- They developed diabetes, hypertension, or depression during pregnancy (31.6% vs. 43.5%)
- They never breast-fed their baby (7.2% vs. 13.9%)
- Baby was exposed to smoke (0.3^% vs. 2.8^%; interpret these percentages with caution)
- They had a high ACE score (4+) (14.0% vs. 33.3%).

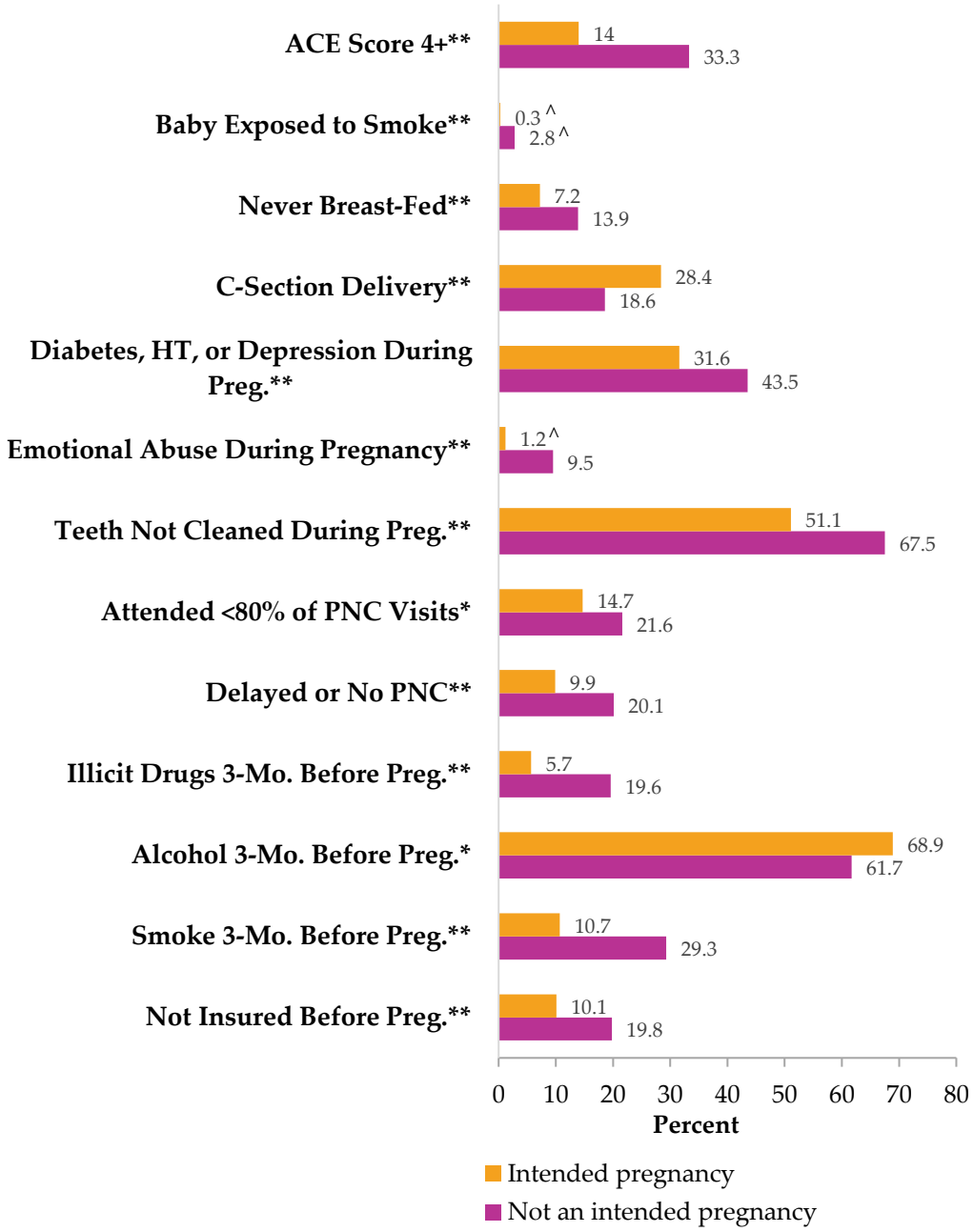
Figure 3.2: Percentage of South Dakota mothers who had an intended pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



** 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.

— Healthy People 2020 (56%)

Figure 3.3: Risk behaviors and outcomes by mothers with an intended pregnancy, South Dakota, 2020 (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

References

1. Guttmacher Institute, Unintended Pregnancy in the United States, January 2019 Fact Sheet. https://www.guttmacher.org/fact-sheet/unintended-pregnancy-united-states, accessed June 26, 2019.

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: Guttmmacher Institute, 2015, http://www.guttmacher.org/pubs/public-costs-of-UP-2010.pdf, accessed June 26, 2019.

Chapter 4: Nutrition and maternal weight (body mass index)

Measure	% of women (95% CI, N)
Vitamin use the *month before* pregnancy	
No vitamin use	43.8 (40.3-47.3, 4545)
1 to 3 times per week	8.3 (6.4-10.2, 864)
4 to 6 times per week	7.4 (5.5-9.3, 764)
Daily use	40.5 (37.0-44.0, 4200)
***Among women who did not take daily vitamins*, reasons include**	
Not planning to get pregnant	62.0 (56.9-67.2, 2829)
Did not think they needed vitamins	39.1 (34.0-44.1, 1780)
Did not want to take vitamins	18.3 (14.1-22.4, 833)
Was not told to take a vitamin	12.7 (9.0-16.3, 577)
Vitamins were too expensive	8.5 (5.3-11.7, 387)
Vitamins gave side effects	5.7 (3.4-8.0, 259)
Pre-pregnancy Body Mass Index (BMI) – National Heart, Blood and Lung Institute definition**	
Underweight (<18.5)	2.0 (1.0-3.1, 208)
Healthy weight (18.5 to less than 25)	42.0 (38.5-45.6, 4351)
Overweight (25.0 to less than 30)	28.1 (24.9-31.3, 2908)
Obese (30 or over)	27.8 (24.7-31.0, 2882)

** 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.

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

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).

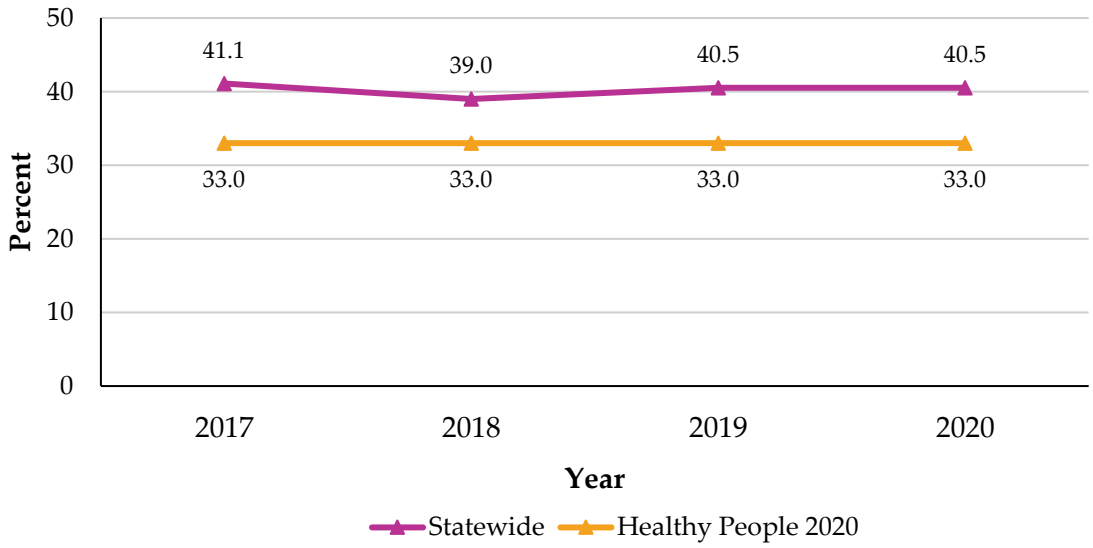
Body Mass Index (BMI) is a measure of the relationship between weight and height (BMI = weight [kg] / height [m]^2) that is associated with body fat and health risk.

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 over time (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, 2017–2020 (weighted)



Demographic Characteristics (Figure 4.2)

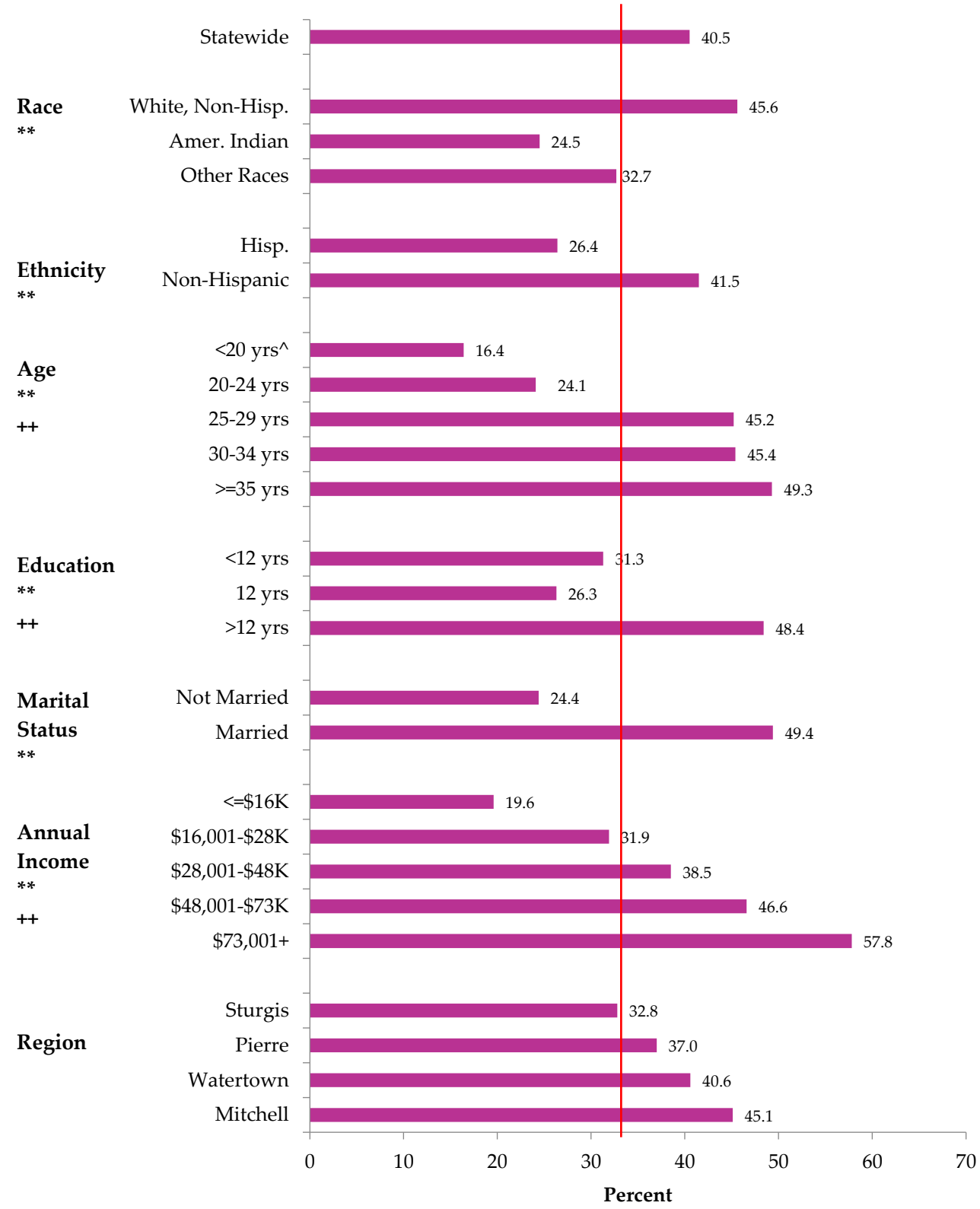
- Overall prevalence of South Dakota mothers who were taking a vitamin daily the month before pregnancy was 40.5%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with the percentage of mothers taking a vitamin daily the month before pregnancy included maternal race, ethnicity, age, education, marital status, and household income.
- Mothers who were white, non-Hispanic, 35 years and older, had more years of education, were 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:

- Their pregnancy was unintended or mistimed (34.6% vs. 47.3%).
- They were uninsured before pregnancy (4.3% vs. 21.4%).
- They smoked the 3 months before pregnancy (10.0% vs. 24.8%).
- They used illicit drugs the 3 months before pregnancy (3.1% vs. 17.7%).
- They started prenatal care after the first trimester or had no prenatal care (8.9% vs. 18.3%).
- They attended less than 80% of PNC visits (14.3% vs. 20.3%).
- They did not have their teeth cleaned during pregnancy (46.2% vs. 66.8%).
- They suffered emotional abuse during pregnancy (2.5^% vs. 6.5%; interpret these percentages with caution).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (30.9% vs. 40.7%).
- Their baby was exposed to smoke (0.4^% vs. 2.1^%: interpret these percentages with caution).
- They had a high ACE score (4+) (17.2% vs. 26.0%).

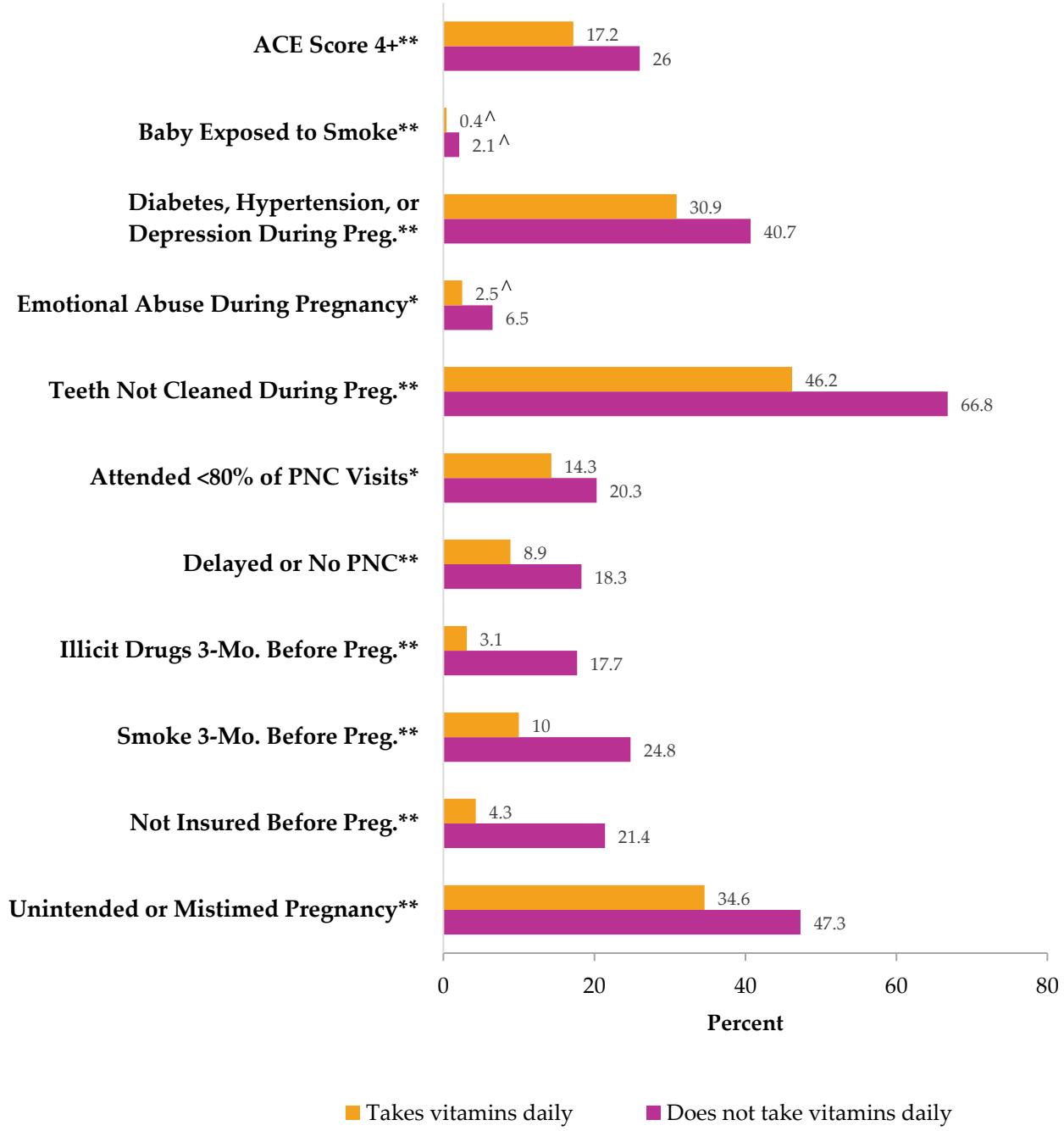
Figure 4.2: Percentage of mothers who were taking a daily vitamin the month before pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



** 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, 2020 (weighted)



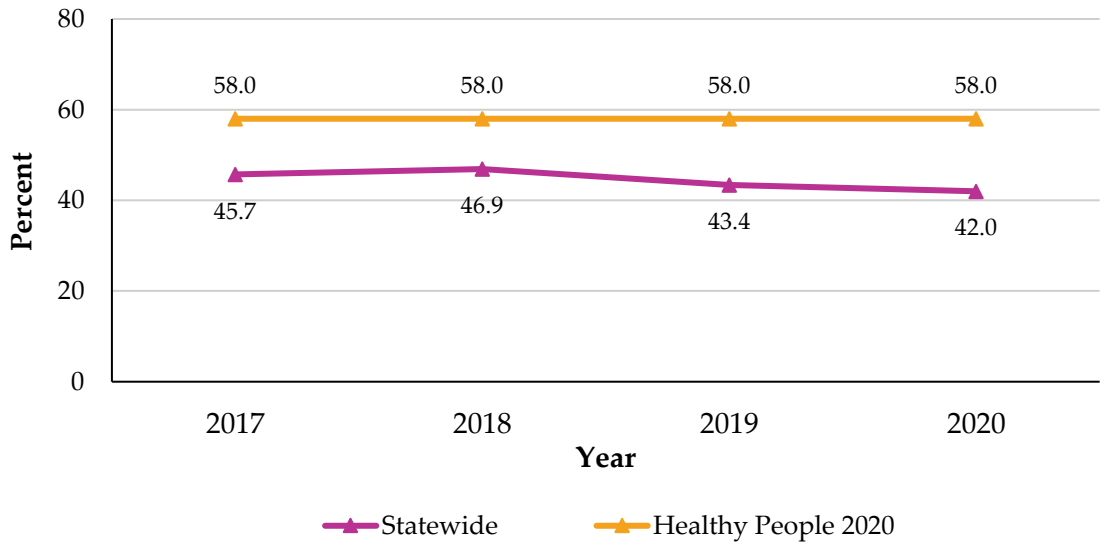
* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

Normal BMI

Prevalence and Trends (Figure 4.4)

The percentage of South Dakota mothers who had a normal BMI before pregnancy has not changed over time (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 normal BMI before pregnancy by year, South Dakota, 2017-2020 (weighted)



Demographic Characteristics (Figure 4.5)

- Overall prevalence of South Dakota mothers with a normal BMI (18.5 - 24.9 kg/m^2) before pregnancy was 42.0%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with the percentage of mothers who had a normal BMI before pregnancy included maternal race and marital age.
- Mothers who were not American Indian and who were less than 20 years in age had a higher prevalence of being a healthy weight compared with their counterparts.

Risk Behaviors and Outcomes (Figure 4.6)

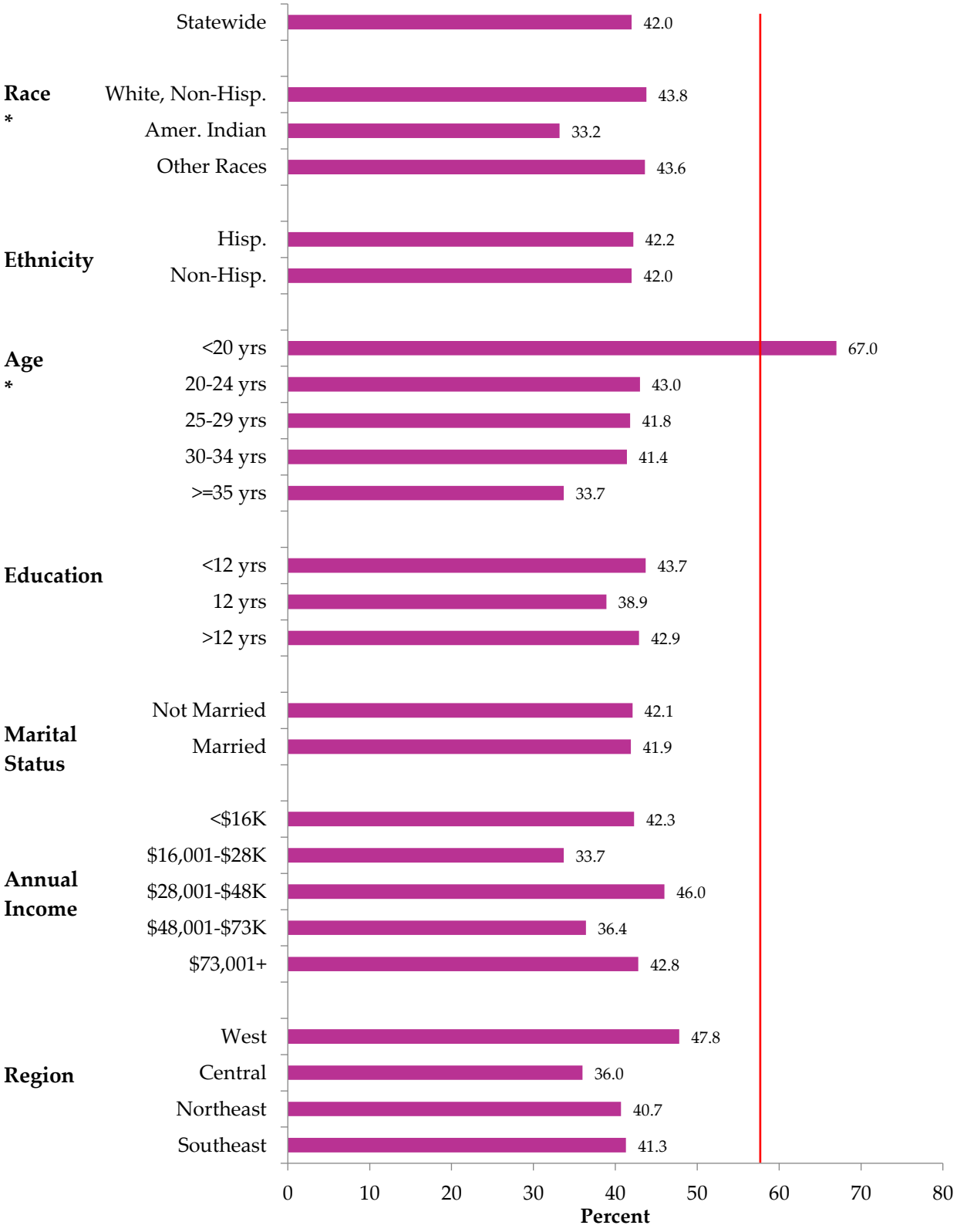
Mothers who had a normal BMI, compared to mothers who *did not have* a normal BMI, were significantly (p-value less than 0.05) *more likely* to report that:

- Infant does not sleep alone in room with mother (56.6% vs. 48.8%).

Mothers who had a normal BMI, compared to mothers who *did not have* a normal BMI, were significantly (p-value less than 0.05) *less likely* to report that:

- They smoked the 3 months before pregnancy (14.5% vs. 21.9%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (23.3% vs. 46.3%).
- They had a cesarean section delivery (18.1% vs. 28.3%).
- The infant was born preterm (6.2% vs. 11.1%).
- They had a high ACE score (4+) (18.1% vs. 25.5%).

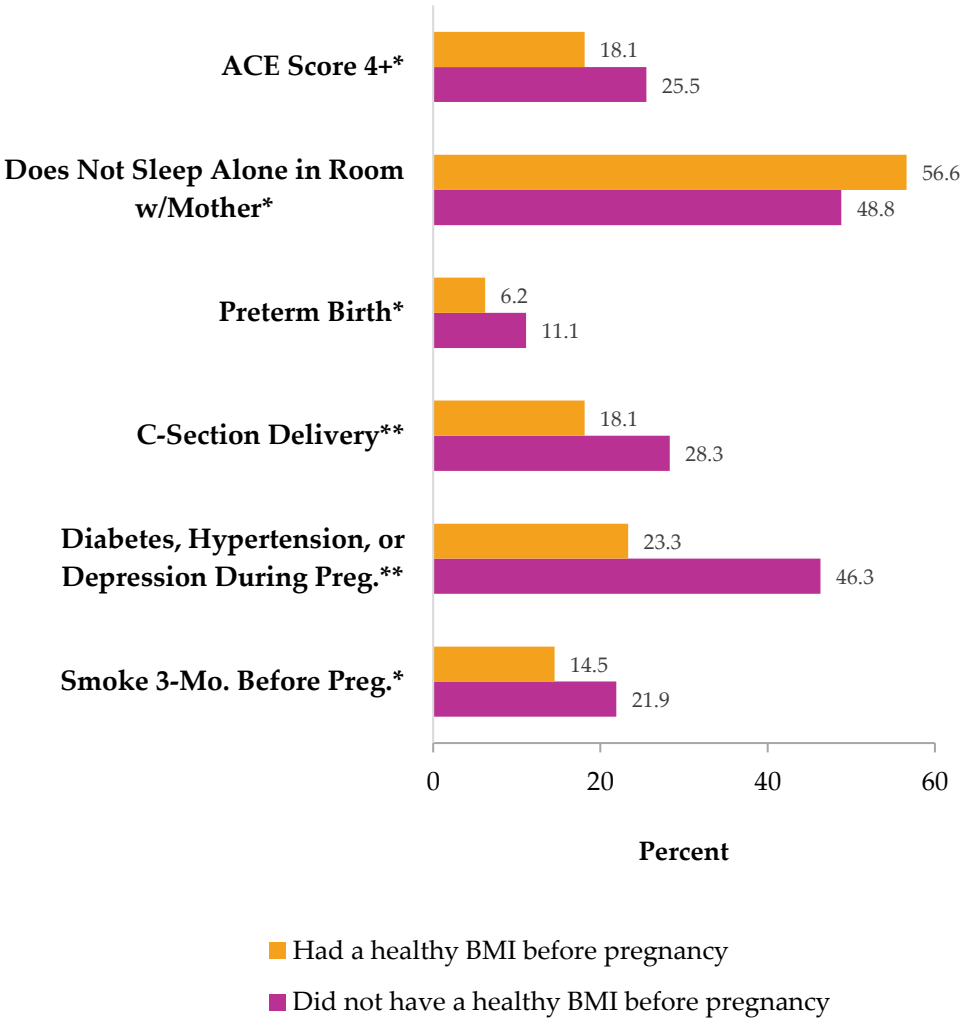
Figure 4.5: Percentage of mothers who had a normal BMI before pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



* p-value <0.05 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 normal BMI before pregnancy, South Dakota, 2020 (weighted)



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

References

1. Scholl TO, Hediger ML, Schall JI, Khoo CS, Fischer RL. Dietary and serum folate: their influence on the outcome of pregnancy. American Journal of Clinical Nutrition 63:520–5. 1996.

2. Li N, Guo J, Pan L, Li B, Wang P, Liu J, Wang Y, Liu G, Baccarelli A, Hou L, Hu G. Maternal prepregnancy body mass index and gestational weight gain on pregnancy outcomes. *PLOS One*, December, 2013: http://dx.doi.org/10.1371/journal.pone.0082310

3. Centers for Disease Control and Prevention. Folic Acid and Prevention of Spina Bifida and Anencephaly. Available at: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5113a1.htm. Accessed March 8, 2019.

Chapter 5: Medical risk factors

Measure	% of women (95% CI, N)
Medical risk factors three months before pregnancy	
Type 1 or type 2 diabetes	1.9 (1.0-2.8, 195)
High blood pressure/hypertension	5.0 (3.5-6.5, 518)
Depression	18.3 (15.5-21.1, 1896)
Medical risk factors during pregnancy	
Gestational diabetes (diabetes that started during this pregnancy)	12.9 (10.5-15.3, 1334)
High blood pressure (that started during this pregnancy), pre-eclampsia or eclampsia	14.8 (12.3-17.4, 1531)
Depression	17.4 (14.7-20.1, 1788)
Received weekly shots of progesterone to prevent preterm birth	4.8 (3.3-6.3, 475)

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?

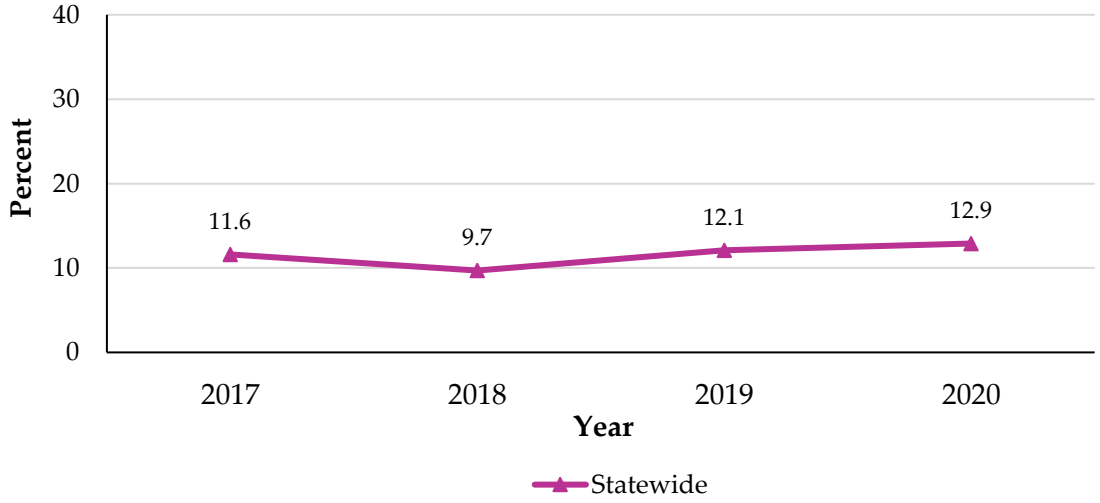
Q28 During *your most recent* pregnancy, did a doctor, nurse, or other health care worker give you a series of weekly shots of medicine called progesterone, Makena®, or 17P (17 alpha-hydroxyprogesterone) to try to keep your new baby from being born too early?

Gestational Diabetes

Prevalence and Trends (Figure 5.1)

The percentage of South Dakota mothers who had gestational diabetes has not changed over time (p-value for linear trend greater than 0.05).

Figure 5.1: Mothers who had gestational diabetes by year, South Dakota, 2017–2020 (weighted)



Demographic Characteristics (Figure 5.2)

- Overall prevalence of South Dakota mothers who had gestational diabetes was 12.9%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with gestational diabetes included maternal age and marital status.
- Mothers who were 35 years and older age and were married had a higher prevalence of gestational diabetes compared to their counterparts.

Risk Behaviors and Outcomes (Figure 5.3)

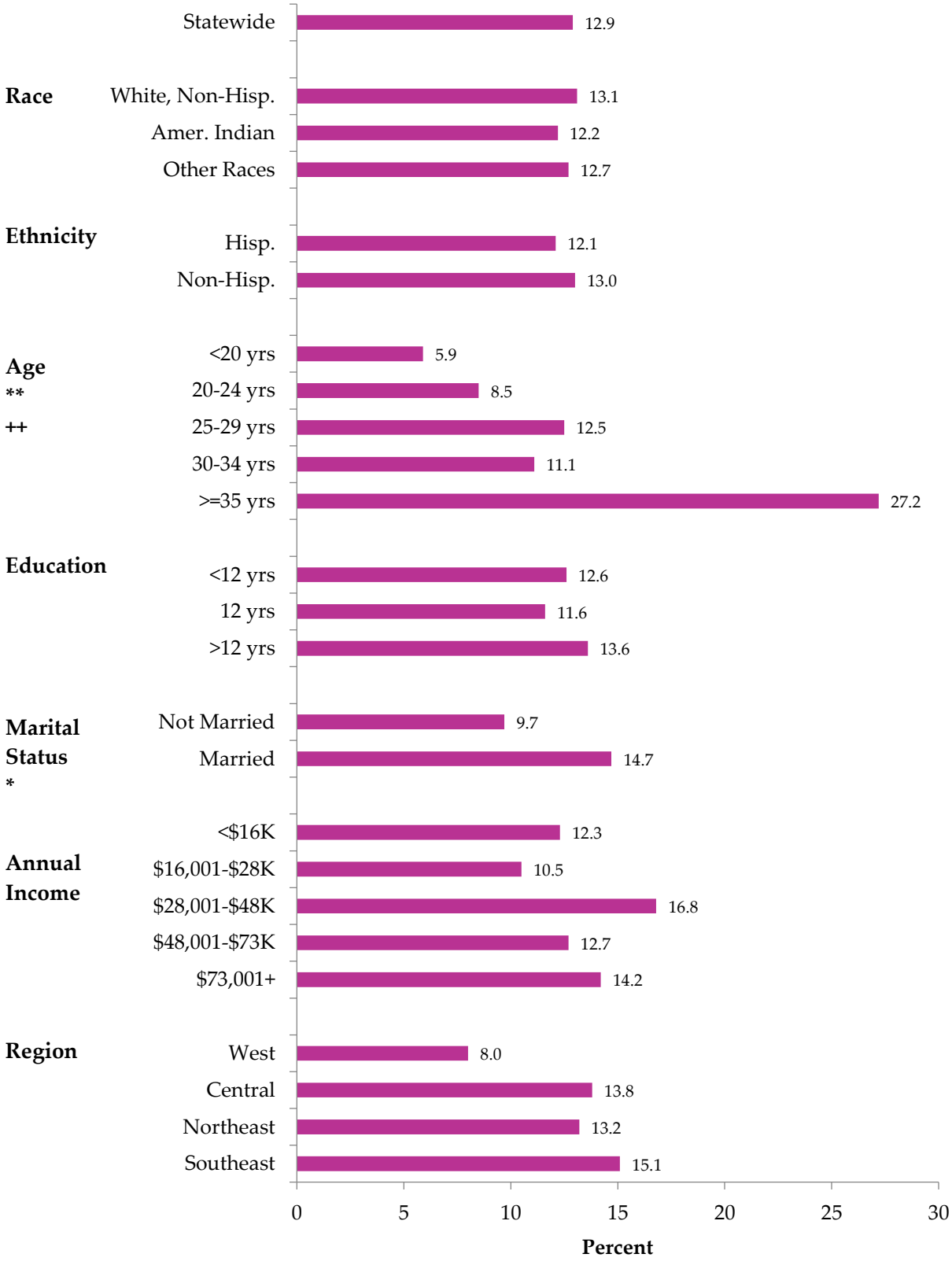
Mothers who reported having gestational diabetes, compared to mothers who *did not* report having gestational diabetes, were significantly (p-value less than 0.05) *more likely* to report that:

- They had obesity prior to pregnancy (56.4% vs. 23.8%).
- They had a cesarean section delivery (33.8% vs. 22.3%)
- Their infant was born preterm (14.0 % vs. 8.0)

Mothers who reported having gestational diabetes, compared to mothers who *did not* report having gestational diabetes, were significantly (p-value less than 0.05) *less likely* to report that:

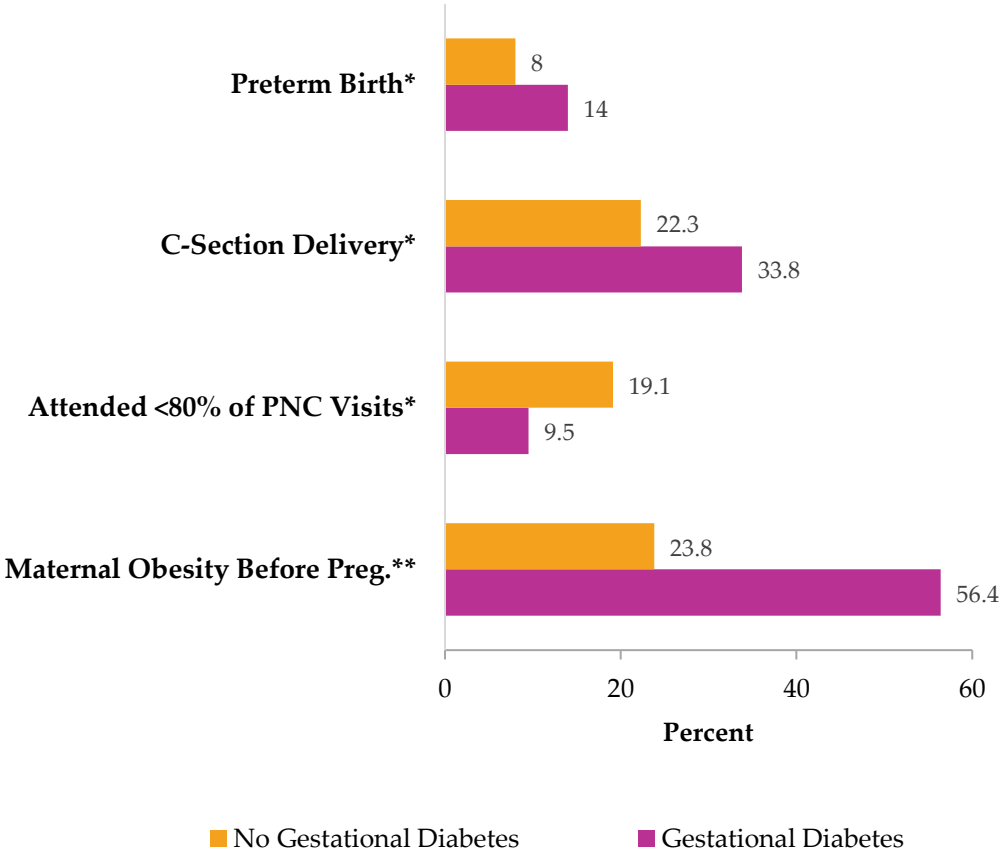
- They attended fewer than 80% of their prenatal visits (9.5% vs. 19.1%).

Figure 5.2: Percentage of mothers who reported gestational diabetes by demographic characteristics, South Dakota, 2020 (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 5.3: Risk behaviors and outcomes by mothers who reporting having gestational diabetes, South Dakota, 2020 (weighted)



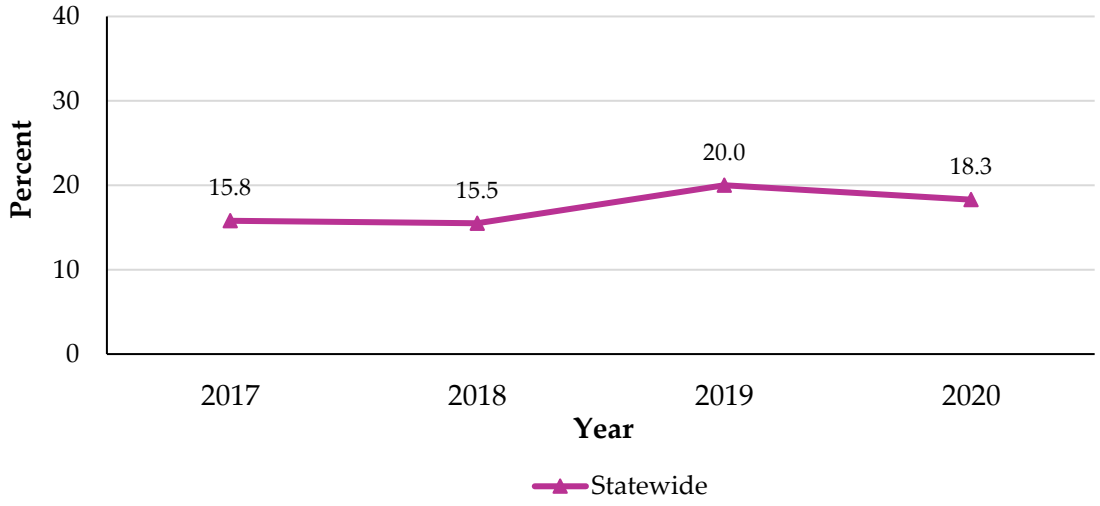
* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
NICU = neonatal intensive care unit, PNC = prenatal care

Depression Before Pregnancy

Prevalence and Trends (Figure 5.4)

The percentage of South Dakota mothers with depression the three months before pregnancy **has increased over time** (p-value for linear trend equal to 0.05).

Figure 5.4: Mothers with depression before pregnancy by year, South Dakota, 2017–2020 (weighted)



Demographic Characteristics (Figures 5.5)

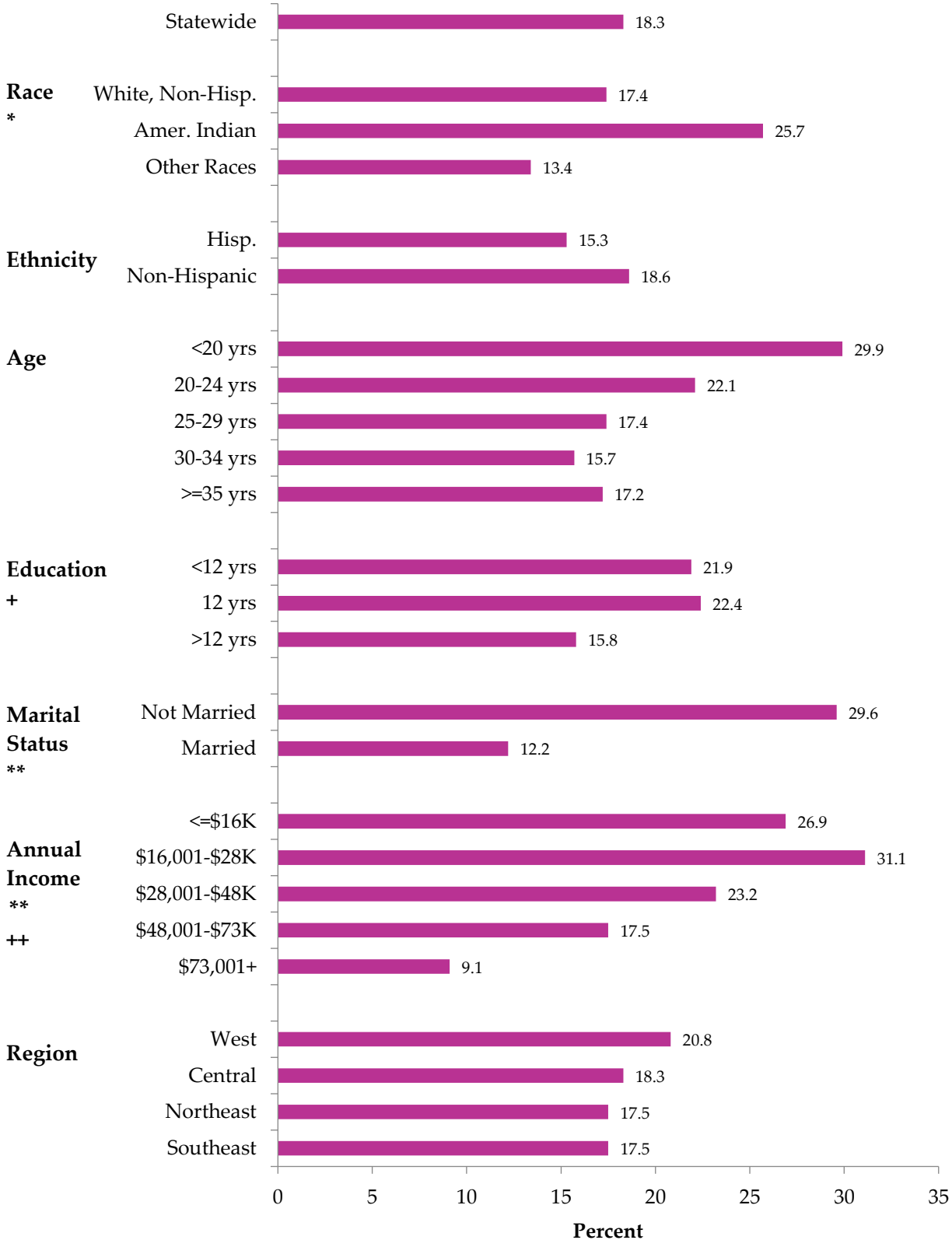
- Overall prevalence of South Dakota mothers who reported having depression the three months before pregnancy was 18.3%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with depression the three months before pregnancy included maternal race, marital status, and household income.
- Mothers who were American Indian, 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:

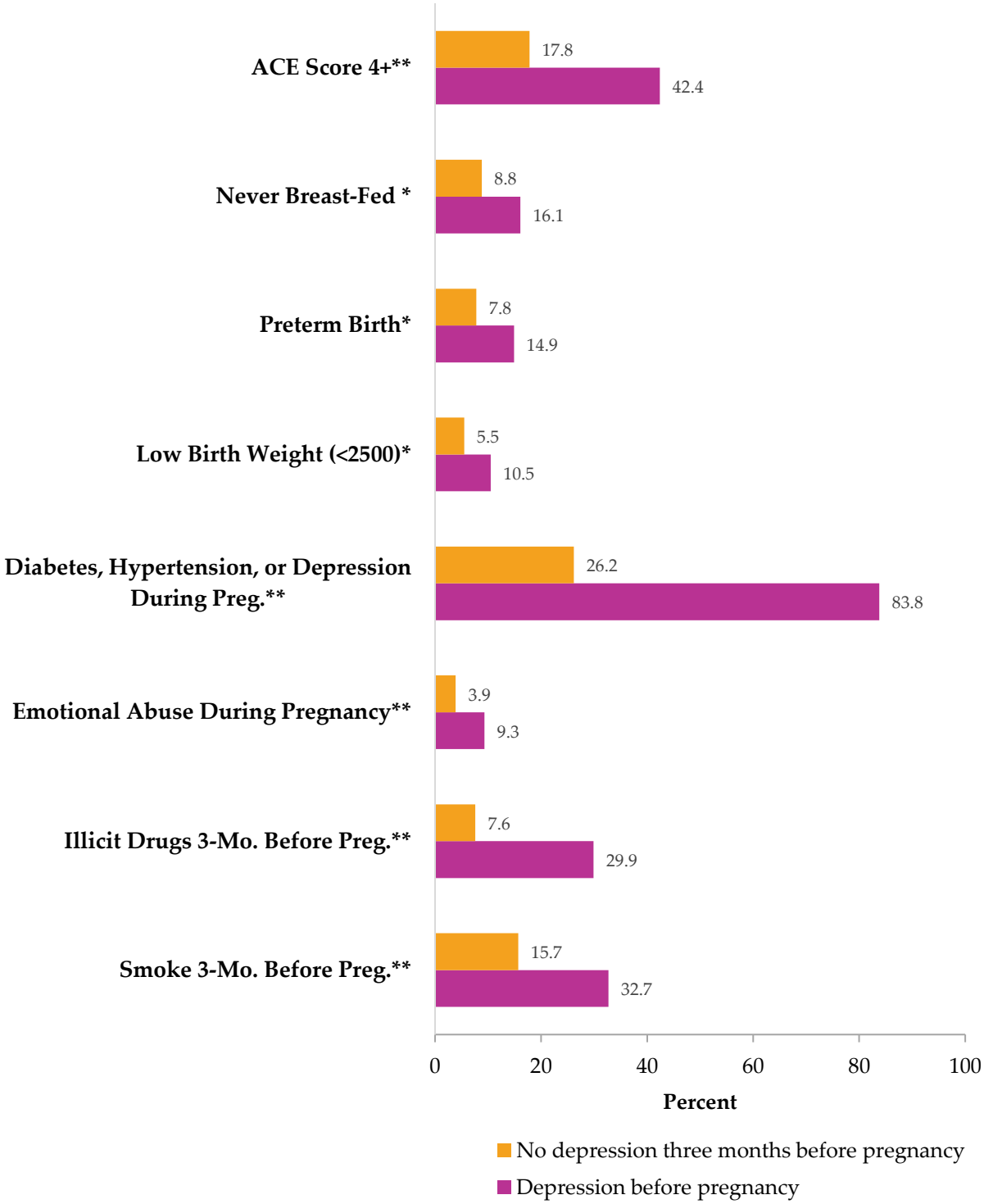
- They smoked the 3 months before pregnancy (32.7% vs. 15.7%).
- They used illicit drugs the 3 months before pregnancy (29.9% vs. 7.6%).
- They suffered emotional abuse during pregnancy (9.3% vs. 3.9%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (83.8% vs. 26.2%).
- Their infant was born low birth weight (<2500) (10.5% vs. 5.5%).
- Their infant was born preterm (14.9% vs. 7.8%).
- Their infant was never breast-fed (16.1% vs. 8.8%)
- They had a high ACE score (4+) (42.4% vs. 17.8%).

Figure 5.5: Percentage of mothers who reported depression the three months before pregnancy by demographic characteristics, South Dakota, 2020 (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 5.6: Risk behaviors and outcomes by mothers who had depression the three months before pregnancy, South Dakota, 2020 (weighted)



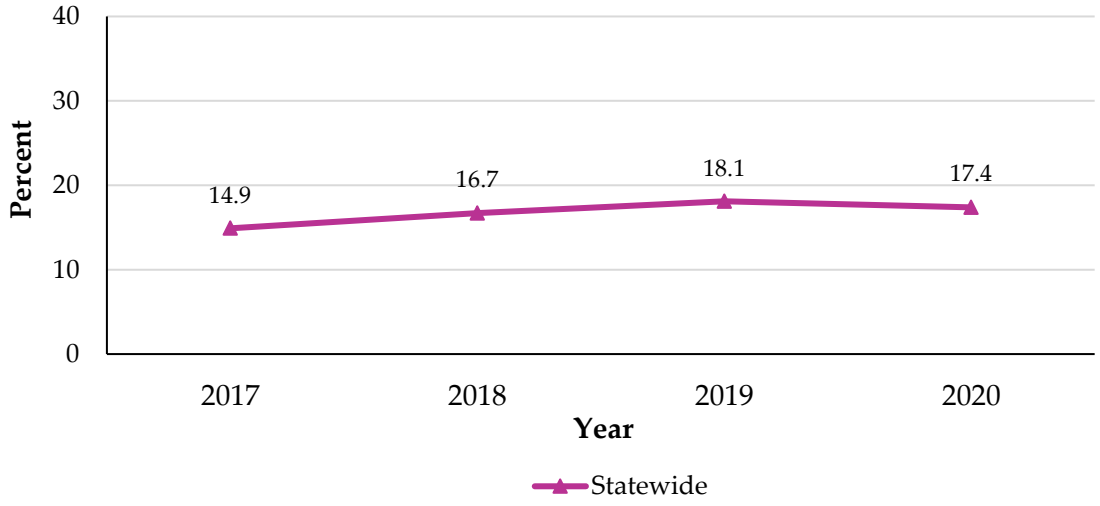
* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
ACE = adverse childhood experiences, PNC = prenatal care

Depression During Pregnancy

Prevalence and Trends (Figure 5.7)

The percentage of South Dakota mothers with depression during pregnancy has not changed over time (p-value for linear trend greater than 0.05).

Figure 5.7: Mothers with depression during pregnancy by year, South Dakota, 2017–2020 (weighted)



Demographic Characteristics (Figures 5.8)

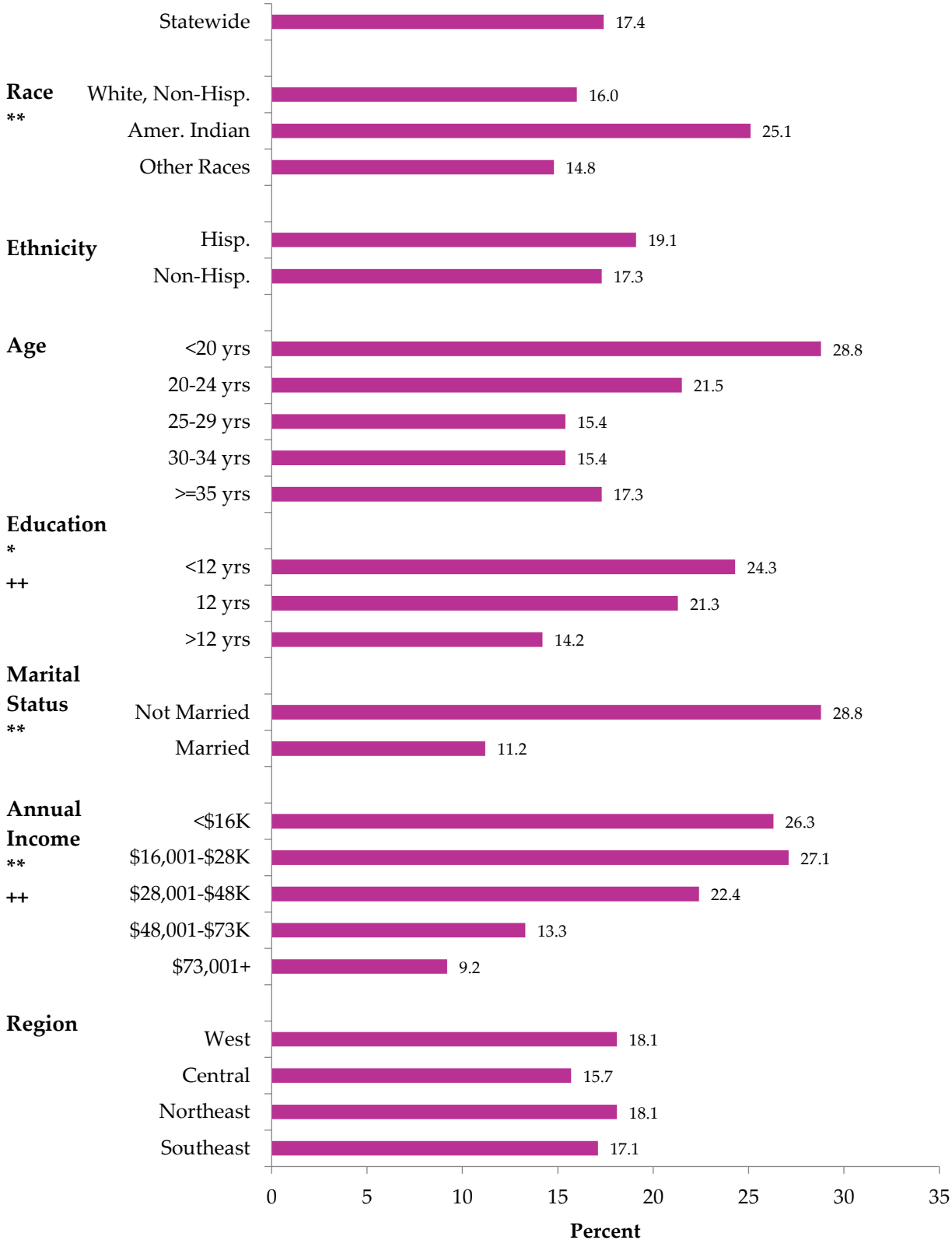
- Overall prevalence of South Dakota mothers who reported having depression during pregnancy was 17.4%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with depression during pregnancy included maternal race, education, marital status, and household income.
- Mothers who were American Indian, had less than a High School education, were not married, and resided in households with less income had a greater prevalence of depression during 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:

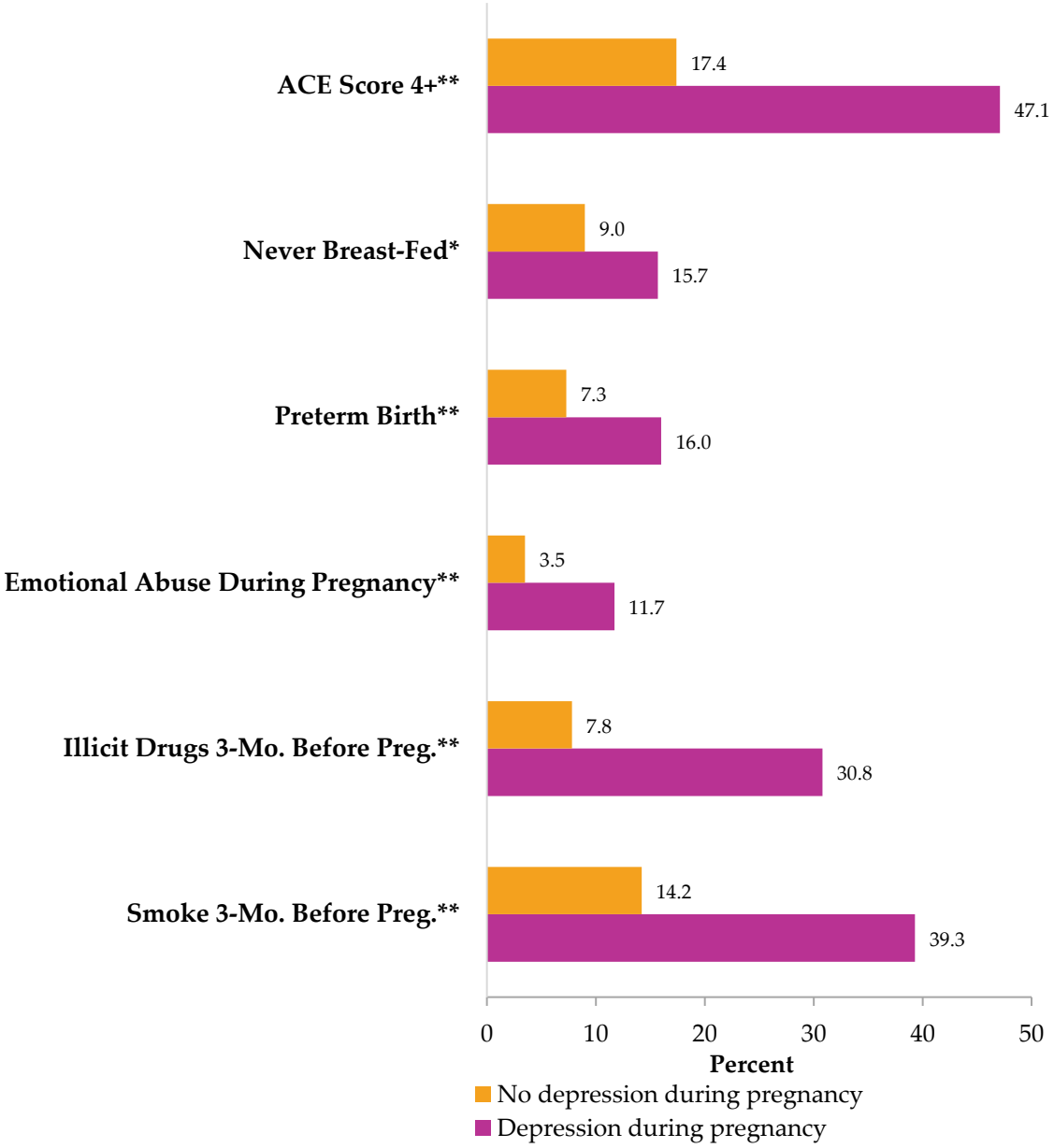
- They smoked the 3 months before pregnancy (39.3% vs. 14.2%).
- They used illicit drugs the 3 months before pregnancy (30.8% vs. 7.8%).
- They suffered emotional abuse during pregnancy (11.7% vs. 3.5%).
- Their infant was born preterm (16.0% vs. 7.3%).
- They never breastfed their infant (15.7% vs. 90%).
- They had a high ACE score (4+) (47.1% vs. 17.4%).

Figure 5.8: Percentage of mothers who reported depression during pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



* 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 to test for linear trend.

Figure 5.9: Risk behaviors and outcomes by mothers who had depression during pregnancy, South Dakota, 2020 (weighted)



* 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

1. Bone R. Big babies: An exploration of gestational diabetes. *International Journal of Childbirth Education.* 30: 42-46, 2015

2. Pennington K, Schlitt J, Jackson D, Schulz L, Schust D. Preeclampsia: Multiple approaches for a multifactorial disease. *Disease Models & Mechanisms.* 5:9-18, 2012.

3. Grote NK, Bridge JA, Gavin AR, Melville JL, Iyengar S, Katon WJ. A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Archives of General Psychiatry*, 67:1012-1024, 2010.

4. Ashley JM, Harper BD, Arms-Chavez CJ, LoBello SG. Estimated prevalence of antenatal depression in the US population. *Archives of Women's Mental Health*. 19:395-400, 2016.

Chapter 6: Prenatal care: entry and adequacy

Measure	% of women (95% CI, N)	
Entry into prenatal care		
Early entry (within first trimester) *	85.6	(83.2-87.9, 8531)
Late entry (after first trimester)	12.9	(10.6-15.1, 1282)
No prenatal care	1.6	(0.8-2.3, 155)
Percent of visits attended**		
Less than 50% or no prenatal care	4.3	(3.2-5.4, 443)
50-79%	13.5	(11.2-15.8, 1395)
80% or greater	82.2	(79.7-84.6, 8463)
Adequacy of prenatal care (Kotelchuck Index) ***		
Inadequate	13.8	(11.7-15.9, 1419)
Intermediate	11.2	(9.0-13.3, 1151)
Adequate	55.1	(51.7-58.6, 5680)
More than adequate	19.9	(17.0-22.8, 2051)

* 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

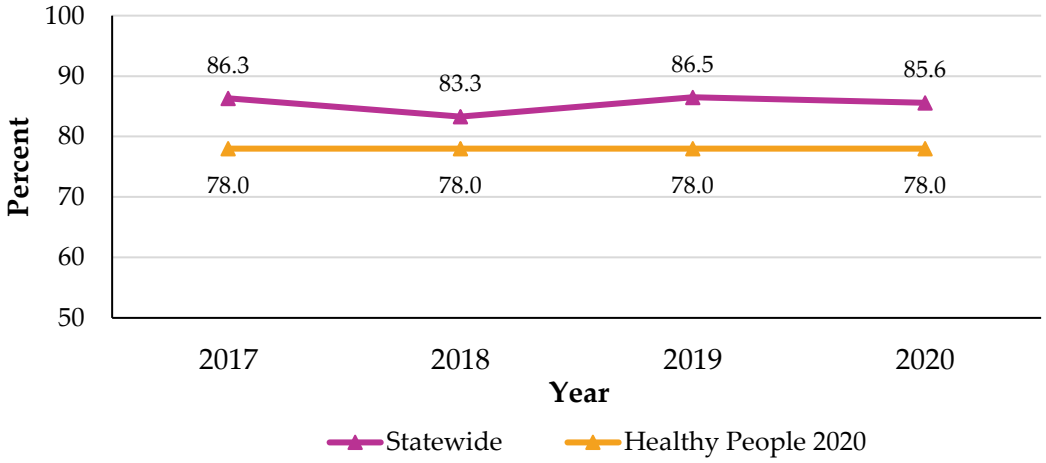
A *trimester* is any of three periods, approximately three months each, into which a human pregnancy is divided.

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 over time (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, 2017–2020 (weighted)



Demographic Characteristics (Figure 6.2)

- Overall prevalence of South Dakota mothers who began prenatal care in the first trimester was 85.6%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with beginning prenatal care in the first trimester 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, and had household incomes greater than $73,000 had a higher prevalence of beginning prenatal care in the first trimester compared with their counterparts. Mothers who resided in the Western and Southeast regions had the highest prevalence of mothers who started prenatal care in the first trimester.

Risk Behaviors and Outcomes by Starting PNC in First Trimester (Figure 6.3)

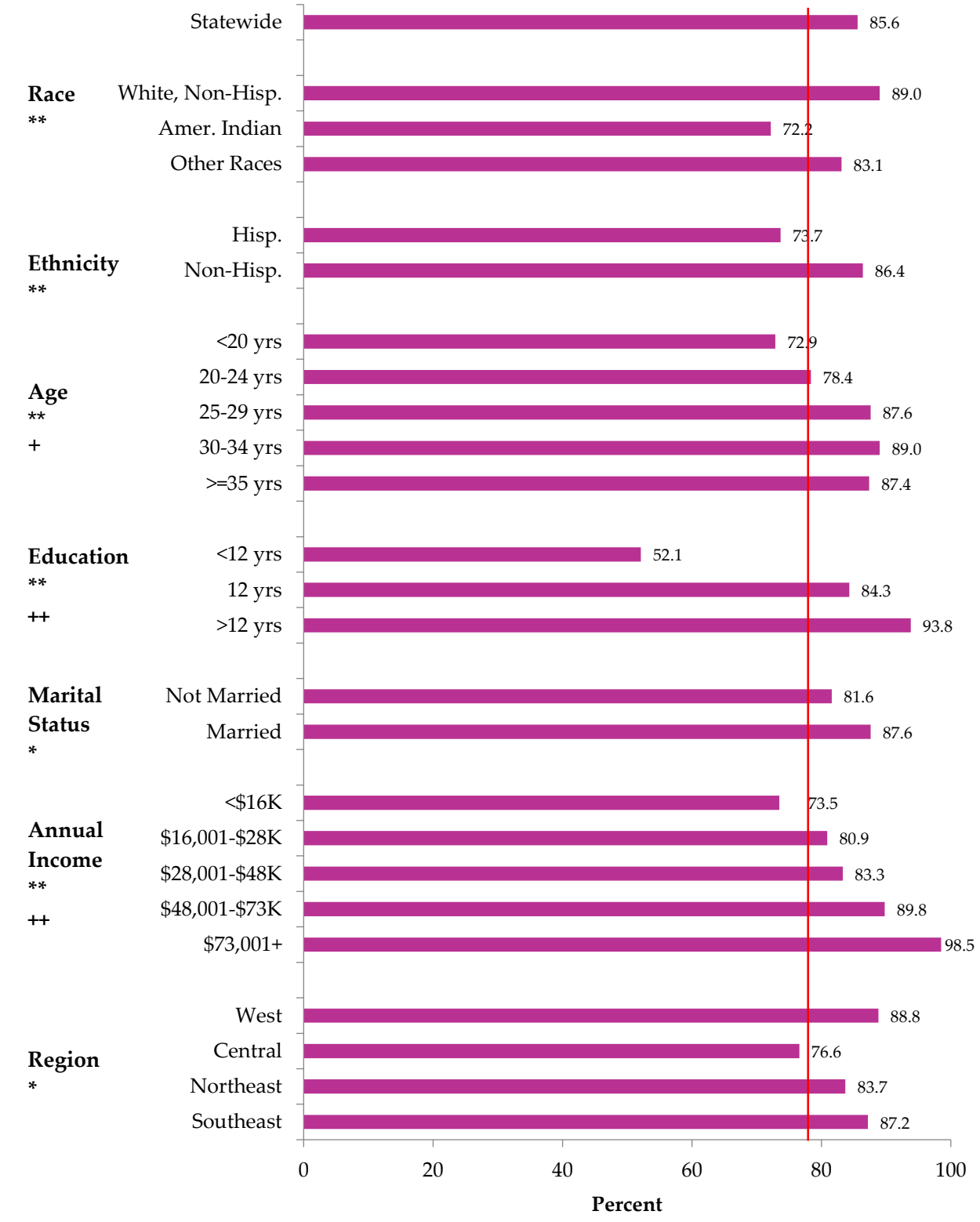
Mothers who started PNC in the 1st trimester, compared to mothers who did not start PNC in the 1st trimester, were significantly (p-value less than 0.05) *more likely* to report that:

- They drank alcohol the 3 months before pregnancy (68.2% vs. 53.7%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (39.1% vs. 29.37%).

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 (12.0% vs. 30.0%).
- They used illicit drugs the 3 months before pregnancy (10.9% vs. 16.8%).
- They attended fewer than 80% of their prenatal visits (13.6% vs. 38.4%).
- They did not have their teeth cleaned during pregnancy (54.7% vs. 74.8%).
- They never breastfed their infant (8.3% vs. 16.4%).

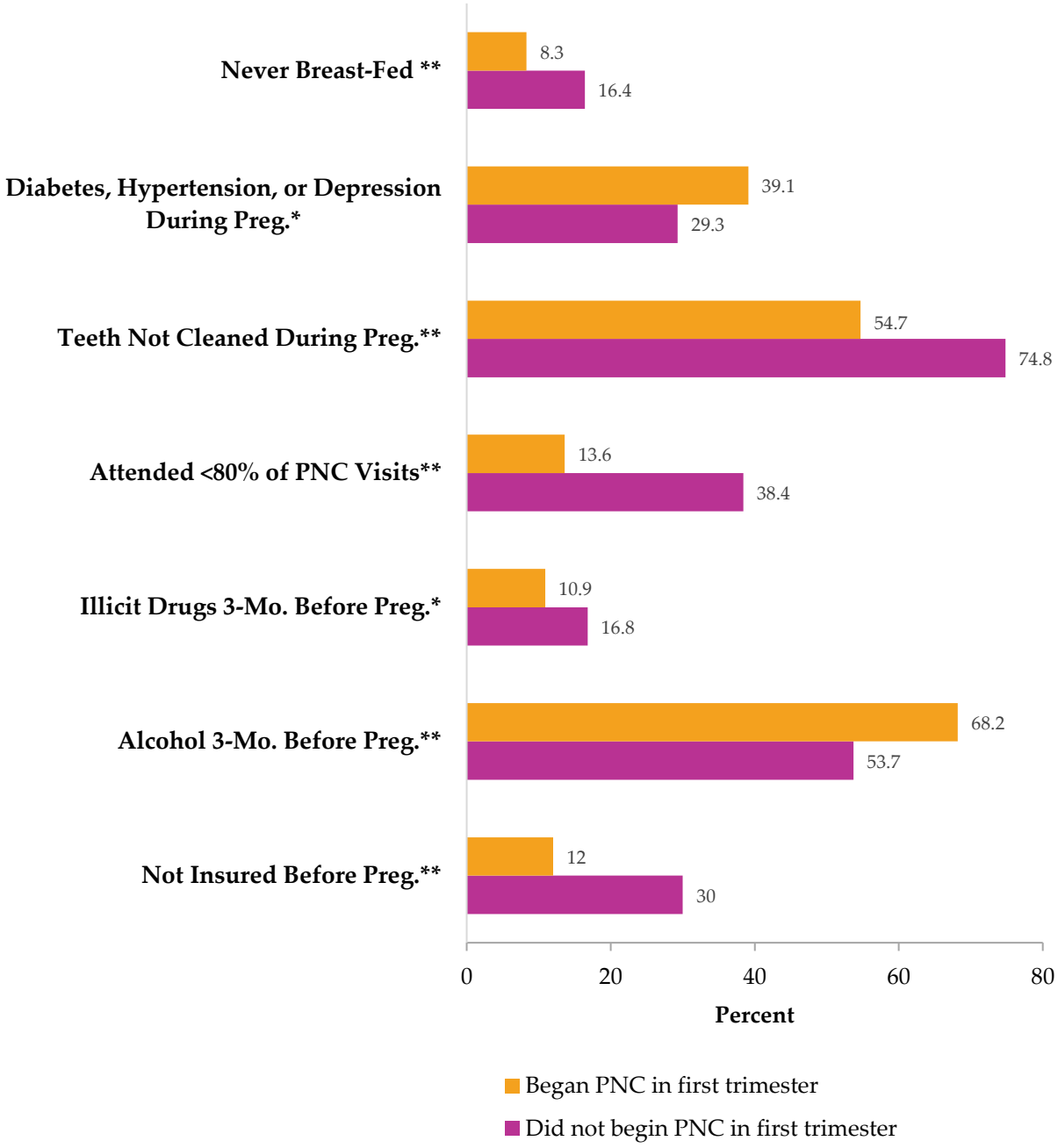
Figure 6.2: Percentage of mothers who began prenatal care in the first trimester by demographic characteristics, South Dakota, 2020 (weighted)



* 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.

— Healthy People 2020 (78%)

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



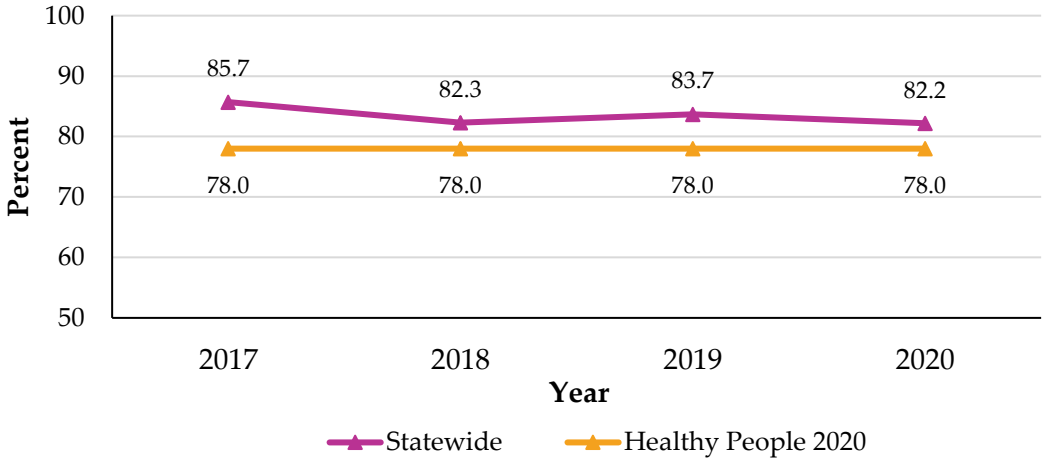
* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
PNC = prenatal care, NICU = neonatal intensive care unit

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 not changed over time (p-value for linear trend greater than 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, 2017–2020 (weighted)



Demographic Characteristics (Figure 6.5)

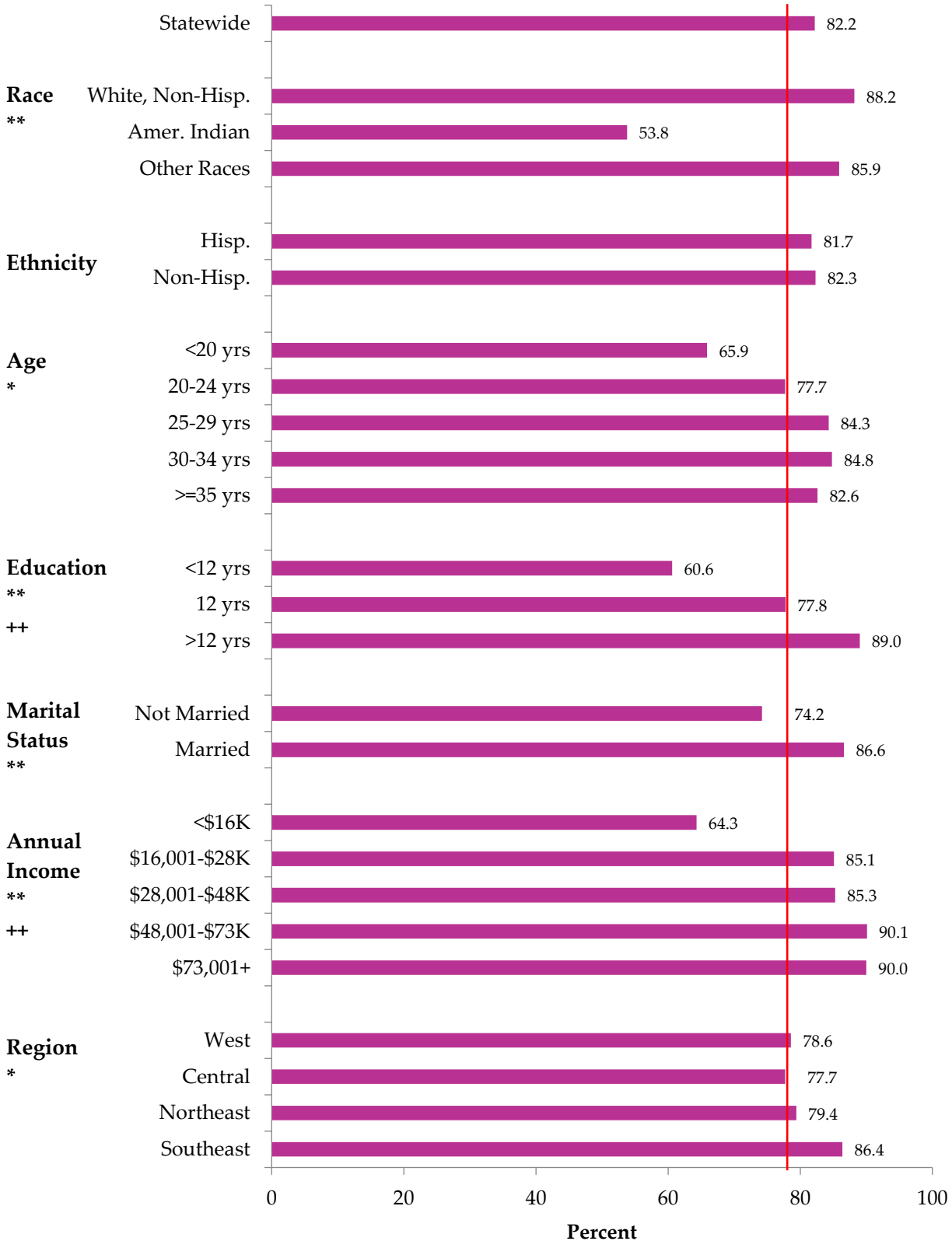
- Overall prevalence of South Dakota mothers who attended 80% or more of their prenatal care visits was 82.2%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with attending 80% or more of prenatal care visits included maternal race, age, education, marital status, household income, and region of the state that the mother resided.
- Mothers who were white, older, had more years of education, were married, and had household incomes greater than $48,000 had higher prevalence of attending 80% or more of prenatal care visits compared with their counterparts. The Southeast region had the highest prevalence 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) *less likely* to report that:

- They smoked the 3 months before pregnancy (16.9% vs. 28.4%).
- They used illicit drugs the 3 months before pregnancy (9.2% vs. 23.6%).
- They started prenatal care after the first trimester or had no prenatal care (10.8% vs. 32.3%).
- They did not have their teeth cleaned during pregnancy (56.5% vs. 65.7%).
- They suffered emotional abuse during pregnancy (3.7% vs. 8.7%).
- They never breastfed their infant (8.6% vs. 15.5%).

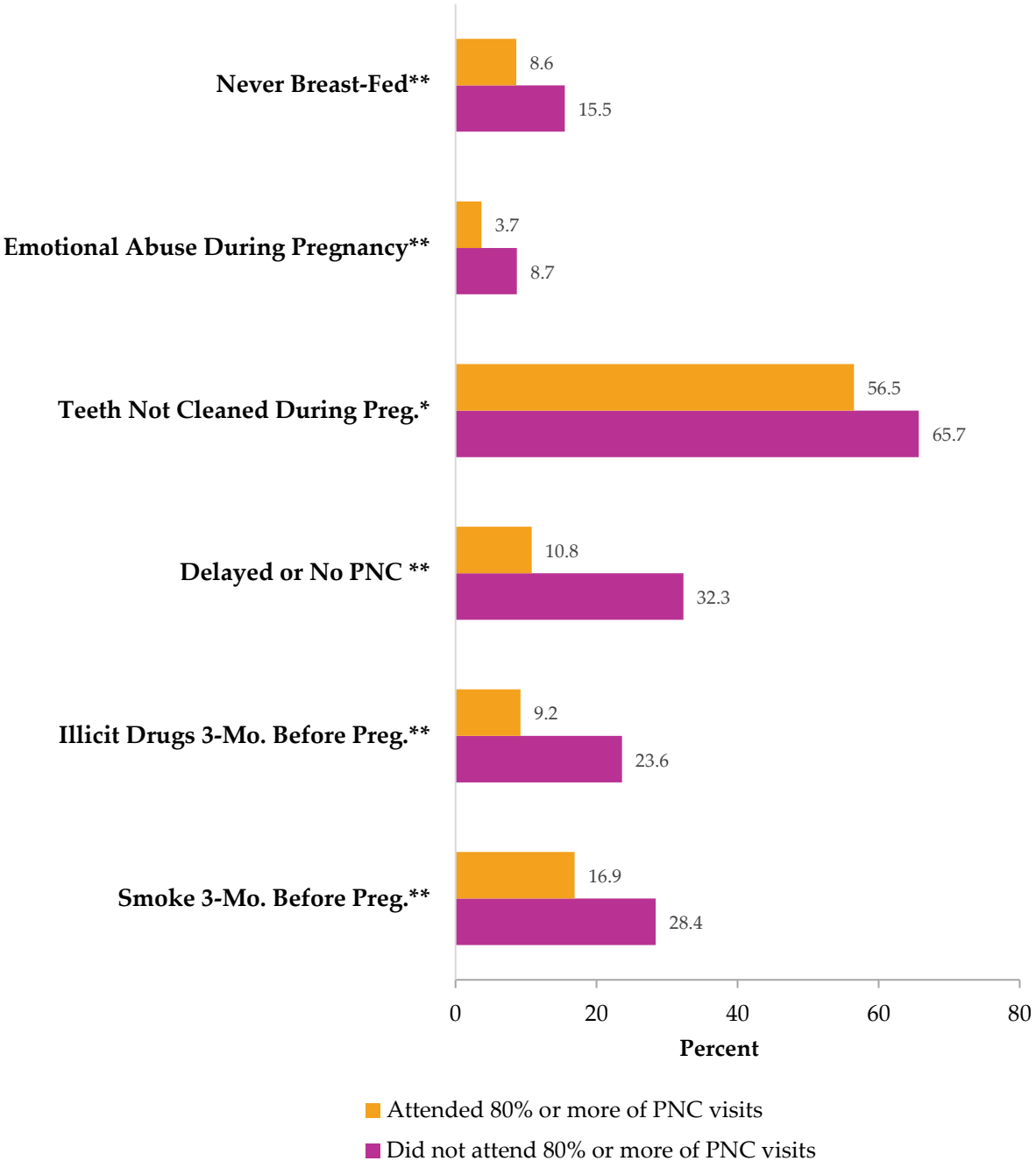
Figure 6.5: Percentage of mothers who attended 80% or more of their prenatal care visits by demographic characteristics, South Dakota, 2020 (weighted)



* 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.

— 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, 2020 (weighted)



* 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

1. Maupin Jr R, Lyman R, Fatsis J, Prystowiski E, Nguyen A, Wright C, et al. Characteristics of women who deliver with no prenatal care. *Journal of Maternal-Fetal and Neonatal Medicine*. 2004;16:45-50.

2. Healthy People 2020 [Internet]. Washington, DC: U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion [cited 03/07/2018]. Available from: https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives.

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	90.1	(88.1-92.0, 8880)
Went to all recommended visits	94.3	(92.7-95.8, 9453)
***Among women who did not get prenatal care as early as they wanted*, barriers**		
Did not know she was pregnant	38.7	(30.3-47.1, 557)
Had too many other things going on	28.4	(21.2-35.7, 387)
Could not get an appointment when wanted	26.2	(18.5-34.0, 366)
Did not want anyone to know she was pregnant	21.1	(13.7-28.5, 289)
Did not have enough money or insurance to pay for visits	19.8	(12.8-26.9, 279)
Did not have any transportation to get to the clinic or doctor's office	16.4	(11.0-21.9, 229)
Did not have anyone to take care of children	11.8	(6.8-16.9, 160)
Doctor or health plan would not start care as early as wanted	11.0	(5.0-17.0, 150)
Did not have a Medicaid card	9.7	(5.2-14.3, 134)
Could not take time off from work or school	6.2	(3.1-9.2, 85)
Did not want prenatal care	4.4	(1.4-7.5, 60)^
Afraid she would be reported for using alcohol/drugs during pregnancy	2.7	(1.3-6.3, 43)^
***Among women who did not go to all recommended visits,* barriers were:**		
Did not have any transportation to get to clinic or doctor's office	32.7	(20.5-45.0, 180)
Too many other things going on	31.4	(18.9-43.9, 174)
Could not get an appointment when wanted one	17.4	(5.7-29.2, 96)^
Could not take time off from work or school	16.0	(5.5-26.5, 88)^
Did not have anyone to take care of children	15.1	(5.1-25.2, 83)^
Did not have enough money or insurance to pay for visits	10.3	(0.9-19.7, 58)^
Did not want prenatal care	5.5	(0.0-11.3, 30)^
Afraid she would be reported for using alcohol/drugs during pregnancy	3.2	(0.0-7.3, 18)^
Did not have Medicaid card	2.6	(0.0-5.9, 14)^
***Among women who received prenatal care,* topics discussed with, or asked about by a health care worker during prenatal care visits:**		
Smoking	96.3	(94.9-97.7, 9605)
Use of prescription medication	97.1	(96.0-98.2, 9725)
Drinking alcohol	95.6	(94.1-97.2, 9516)
Breastfeeding	93.5	(91.7-95.3, 9346)
Symptoms of depression	86.6	(84.1-89.2, 8660)
Postpartum birth control	83.9	(81.2-86.6, 8375)
Emotional or physical abuse	82.9	(80.1-85.7, 8296)
Illegal drugs	80.6	(77.6-83.5, 8063)
Weight gain during pregnancy	59.2	(55.6-62.8, 5907)
HIV testing	45.4	(41.8-49.1, 4534)

^ 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?

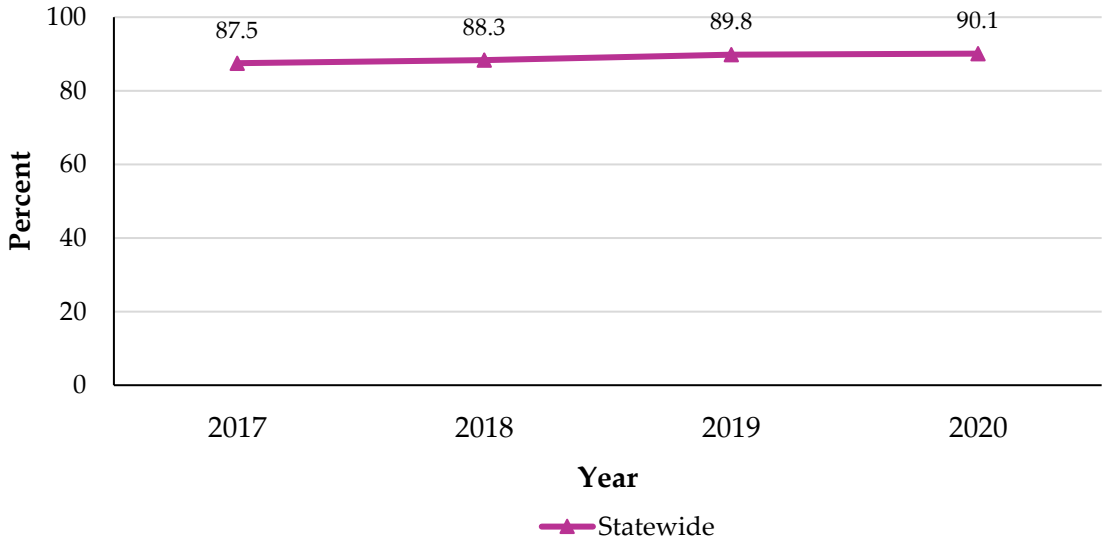
Q70 Did any of these things keep you from *going* to your recommended prenatal visits? [List]

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 over time (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, 2017-2020 (weighted)



Demographic Characteristics (Figure 7.2)

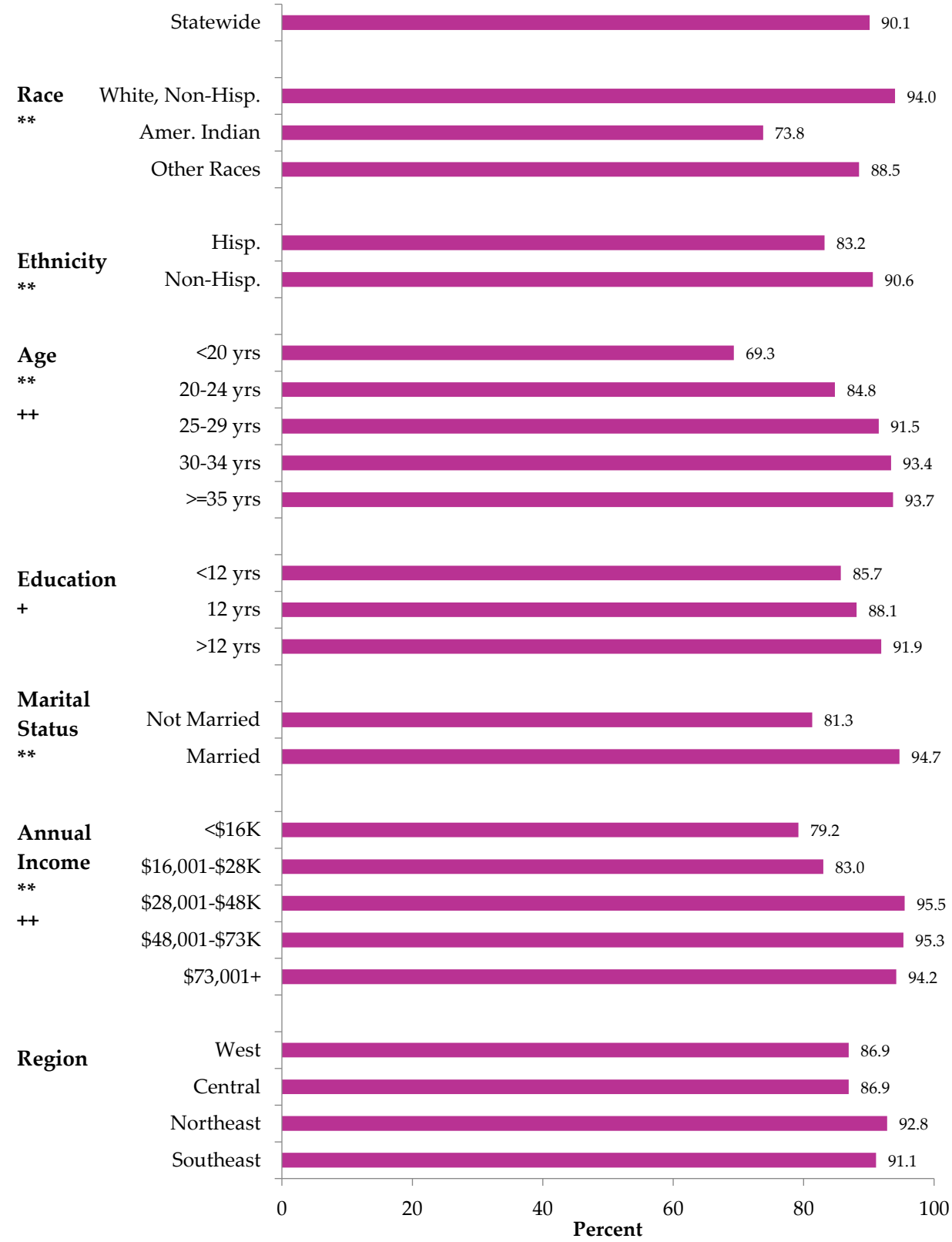
- Overall prevalence of South Dakota mothers who started prenatal care as early as they wanted was 90.1%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with receiving prenatal care as early as they wanted included maternal race, ethnicity, age, marital status, and household income.
- Mothers who were white, non-Hispanic, 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.

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:

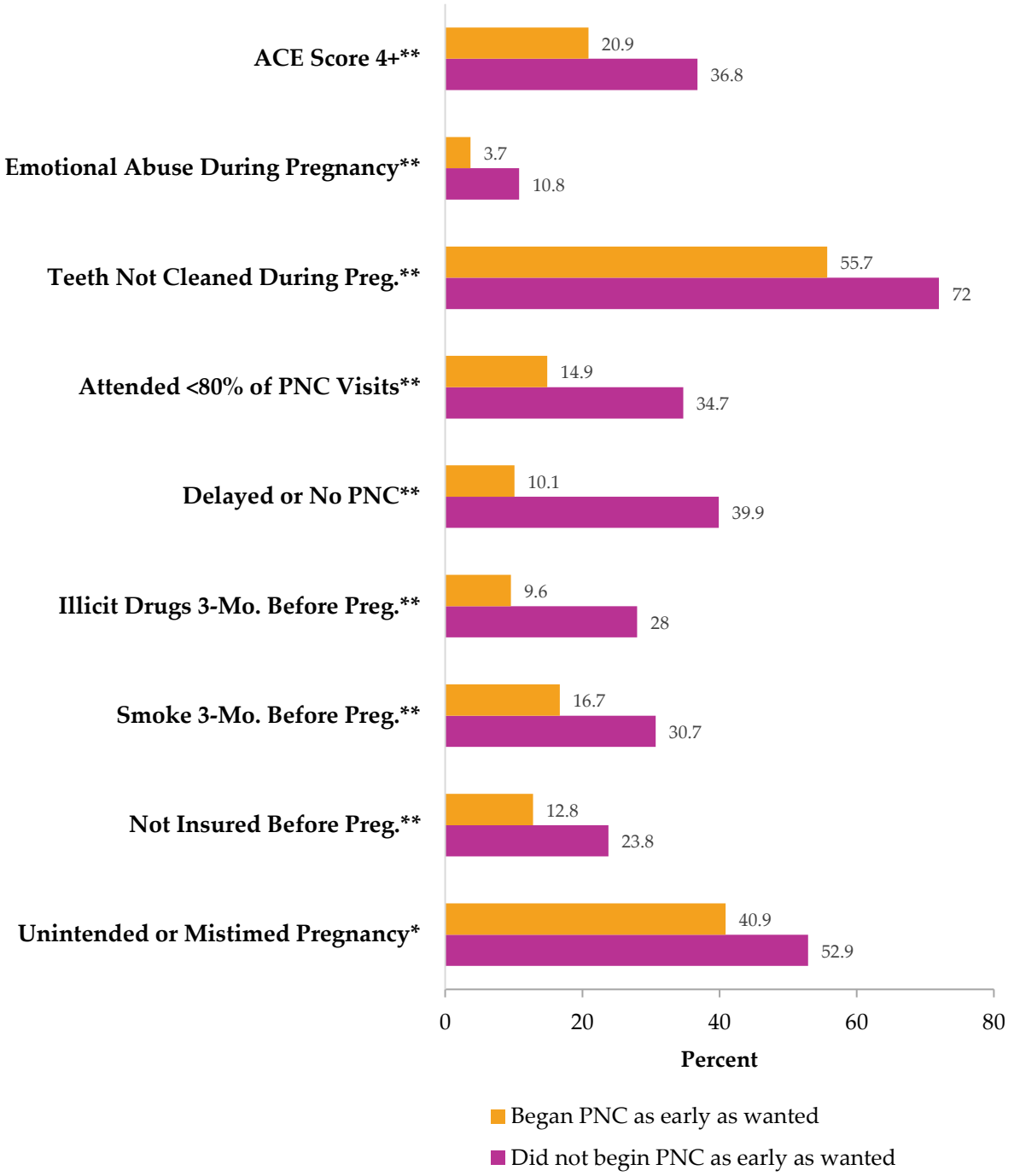
- They had an unintended or mistimed pregnancy (40.9% vs. 52.9%)
- They were uninsured before pregnancy (12.8% vs. 23.8%).
- They smoked the 3 months before pregnancy (16.7% vs. 30.7%).
- They used illicit drugs the 3 months before pregnancy (9.6% vs. 28.0%).
- They started prenatal care after the first trimester or had no prenatal care (10.1% vs. 39.9%).
- They attended fewer than 80% of their prenatal visits (14.9% vs. 34.7%).
- They did not have their teeth cleaned during pregnancy (55.7% vs. 72.0%).
- They suffered emotional abuse during pregnancy (3.7% vs. 10.8%).
- They had a high ACE score (4+) (20.9% vs. 36.8%).

Figure 7.2: Percentage of mothers who received prenatal care as early as they wanted by demographic characteristics, South Dakota, 2020 (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 7.3: Risk behaviors and outcomes by mothers who began prenatal care as early as they wanted, South Dakota, 2020 (weighted)



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

Chapter 8: Flu vaccinations

Measure	% of women (95% CI, N)	
Flu shot offered during the 12 months before delivery of the infant	90.9	(89.0-92.9, 9409)
Flu shot received the 12 months before the infant's birth		
No	24.0	(21.0-27.0, 2474)
Yes, before pregnancy	14.7	(12.2-17.2, 1513)
Yes, during pregnancy	61.3	(57.8-64.8, 6318)

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

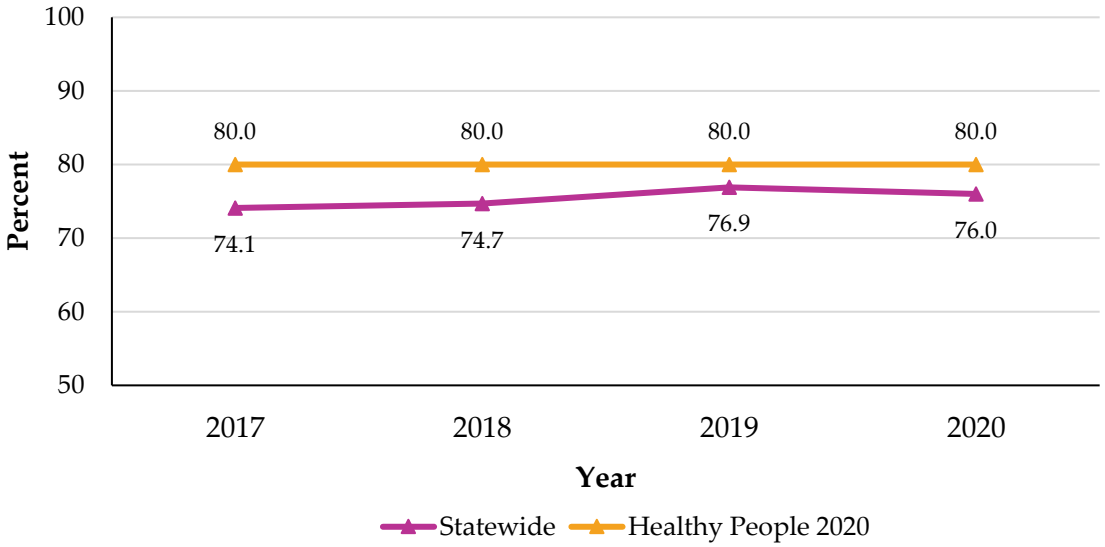
- **IID-12.10** Increase the percentage of pregnant women who are vaccinated against seasonal influenza to 80.0%.

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 over time (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 80% has not been achieved in any year.

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, 2017–2020 (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 76%.
- 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 education and household income.
- Mothers who were had more years of education and had household incomes great than $73,000 had a higher prevalence of receiving a flu vaccine the 12 months before the delivery of the infant compared with their counterparts.

Risk Behaviors and Outcomes (Figure 8.3)

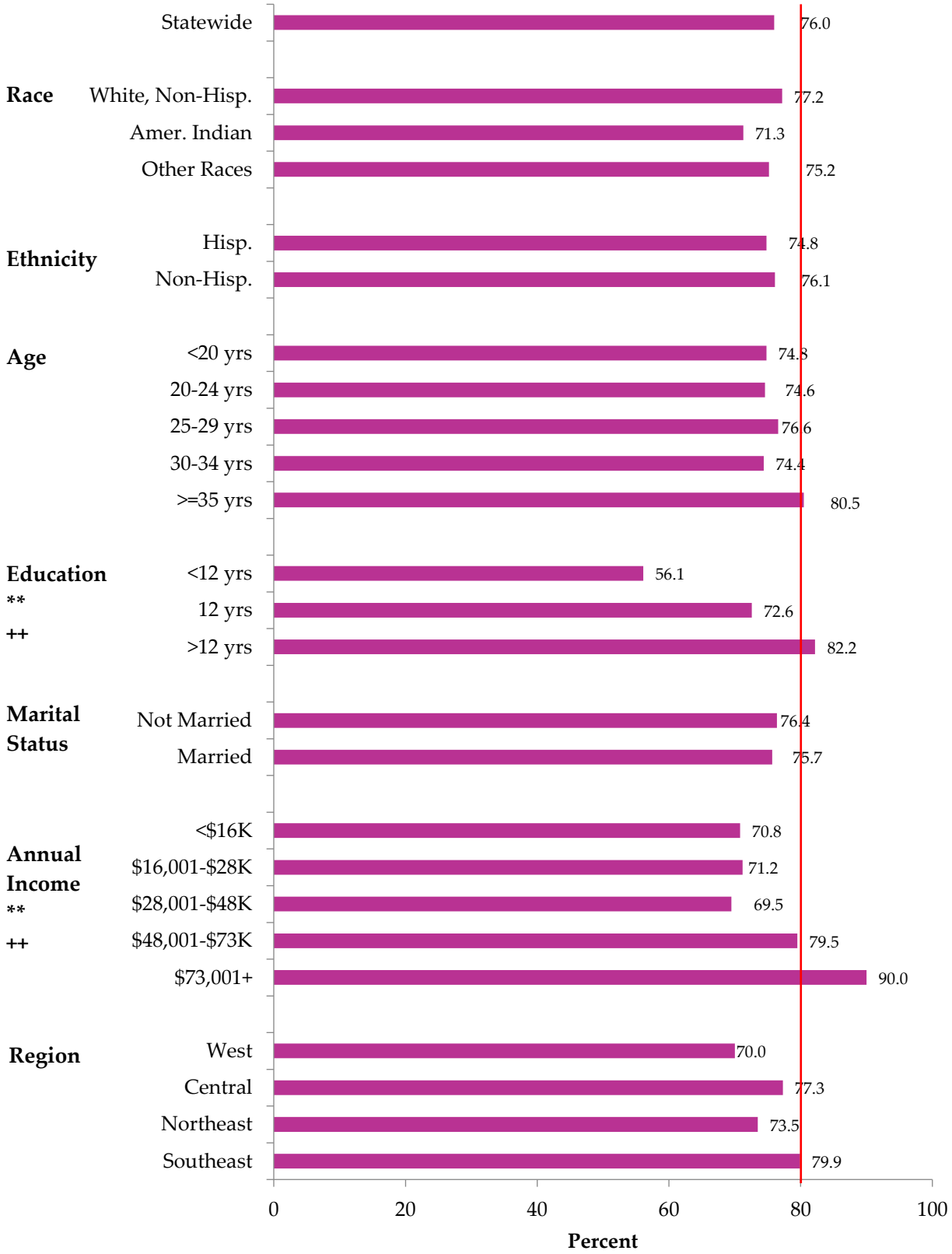
Mothers who had a flu shot 12 months before delivery, compared to mothers who did not have a flu shot before delivery, were significantly (p-value less than 0.05) *more likely* to report that:

- They drank alcohol the 3 months before pregnancy (68.4% vs. 56.5%).

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 (12.4% vs. 21%).
- They started prenatal care after the first trimester or had no prenatal care (9.2% vs. 30.2%).
- They attended fewer than 80% of their prenatal visits (15.5% vs. 24.9%).
- They did not have their teeth cleaned during pregnancy (54.4% vs. 72.4%).

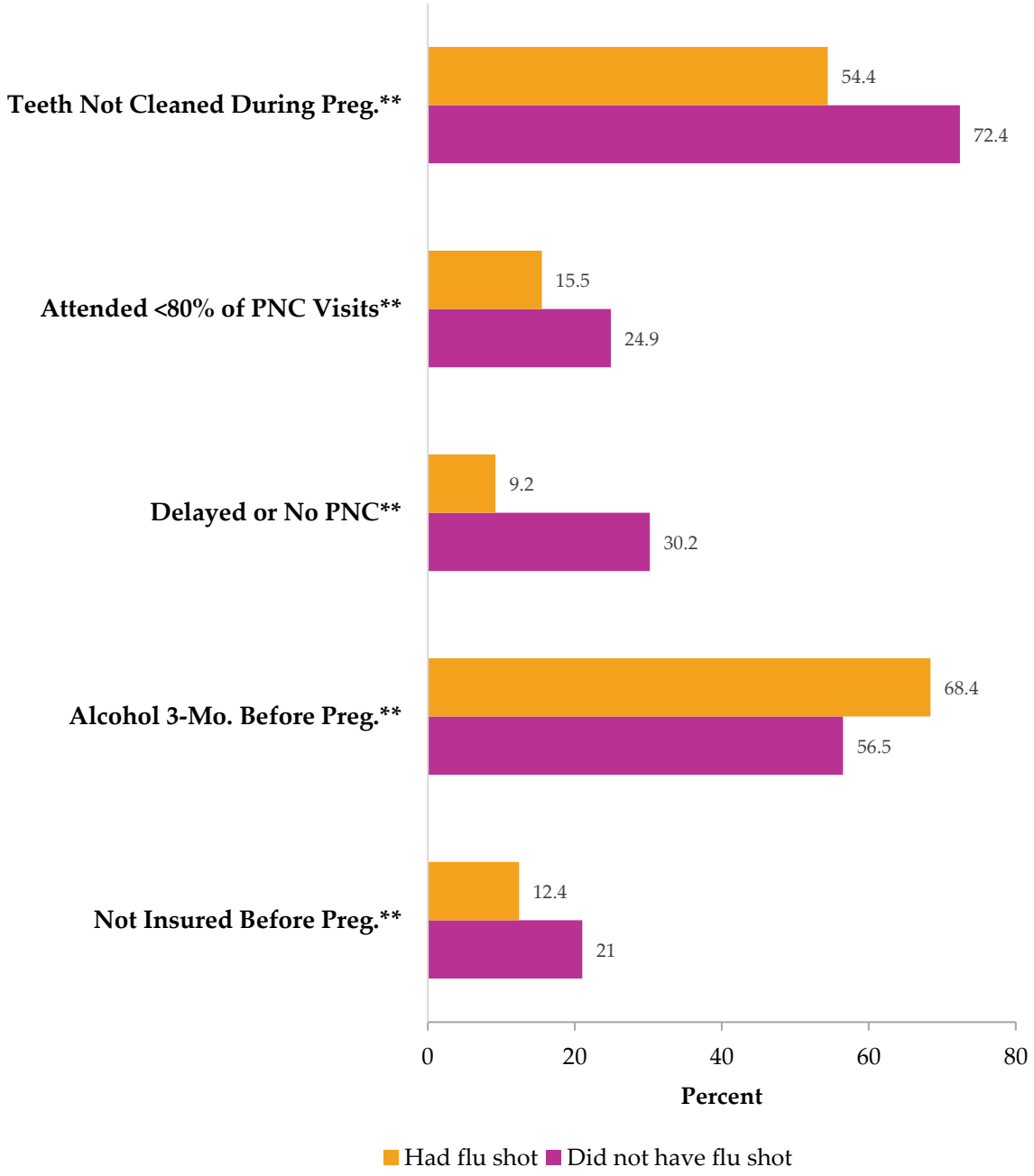
Figure 8.2: Percentage of mothers who received a flu vaccine in the 12 months before the infant's birth by demographic characteristics, South Dakota, 2020 (weighted)



* 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.

Healthy People 2020 (80%)

Figure 8.3: Risk behaviors and outcomes by mothers who received a flu vaccine the 12 months before the infant's birth, South Dakota, 2020 (weighted)



* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
PNC = prenatal care

References

1. Bortz K, Peidra P. Severe flu in pregnant women linked to adverse infant outcomes. Infectious Diseases in Children 32:14, 2019.

Chapter 9: Oral health

Measure	% of women (95% CI, N)	
Had teeth cleaned *12 months before* getting pregnant	65.1	(60.8-69.3, 4503)
Had teeth cleaned *during most recent* pregnancy	41.6	(38.1-45.1,4318)
Barriers to dental care		
Could not afford to go to the dentist/dental clinic	18.0	(15.2-20.8, 1805)
Did not think it was safe to go to the dentist during pregnancy	13.3	(11.2-15.5, 1336)
Could not find a dentist/dental clinic that would take Medicaid patients	8.4	(6.5-10.3, 826)
Could not find a dentist/dental clinic that would take pregnant patients	3.4	(2.3-4.6, 340)

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

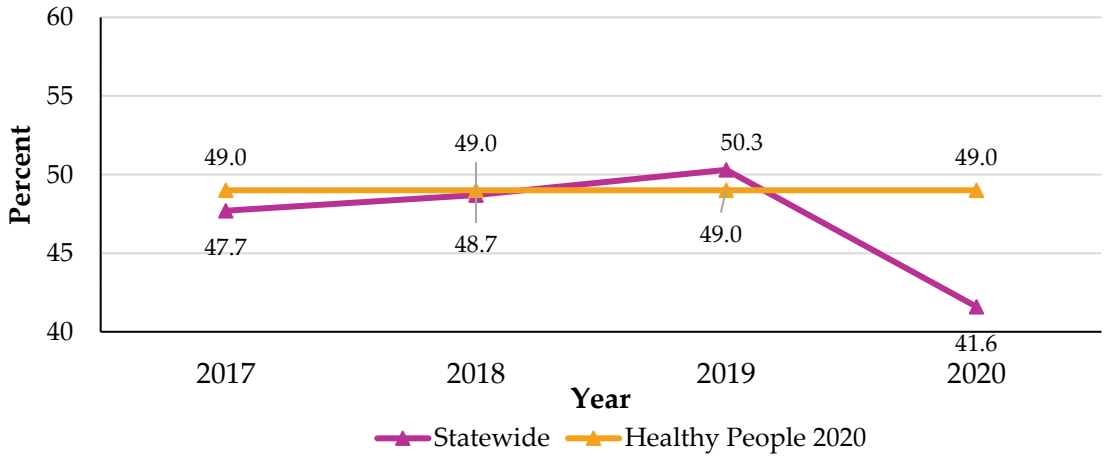
- **OH-7** Increase the proportion of children, adolescents, and adults who used the oral health care system in the past year to 49%.

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 decreased** over time (p-value for linear trend less than 0.05). The Healthy People 2020 goal of 49% was achieved in 2019, but no other year.

Figure 9.1: Mothers who had their teeth clean during their most recent pregnancy by year, South Dakota, 2017–2020 (weighted)



Demographic Characteristics (Figure 9.2)

- Overall prevalence of South Dakota mothers who had their teeth clean *during their most recent* pregnancy was 41.6%.
- 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, and household income.
- Mothers who were white, non-Hispanic, older, had more years of education, were married, and had a household income greater than $73,000 had a higher prevalence of having their teeth cleaned during their most recent pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 9.3)

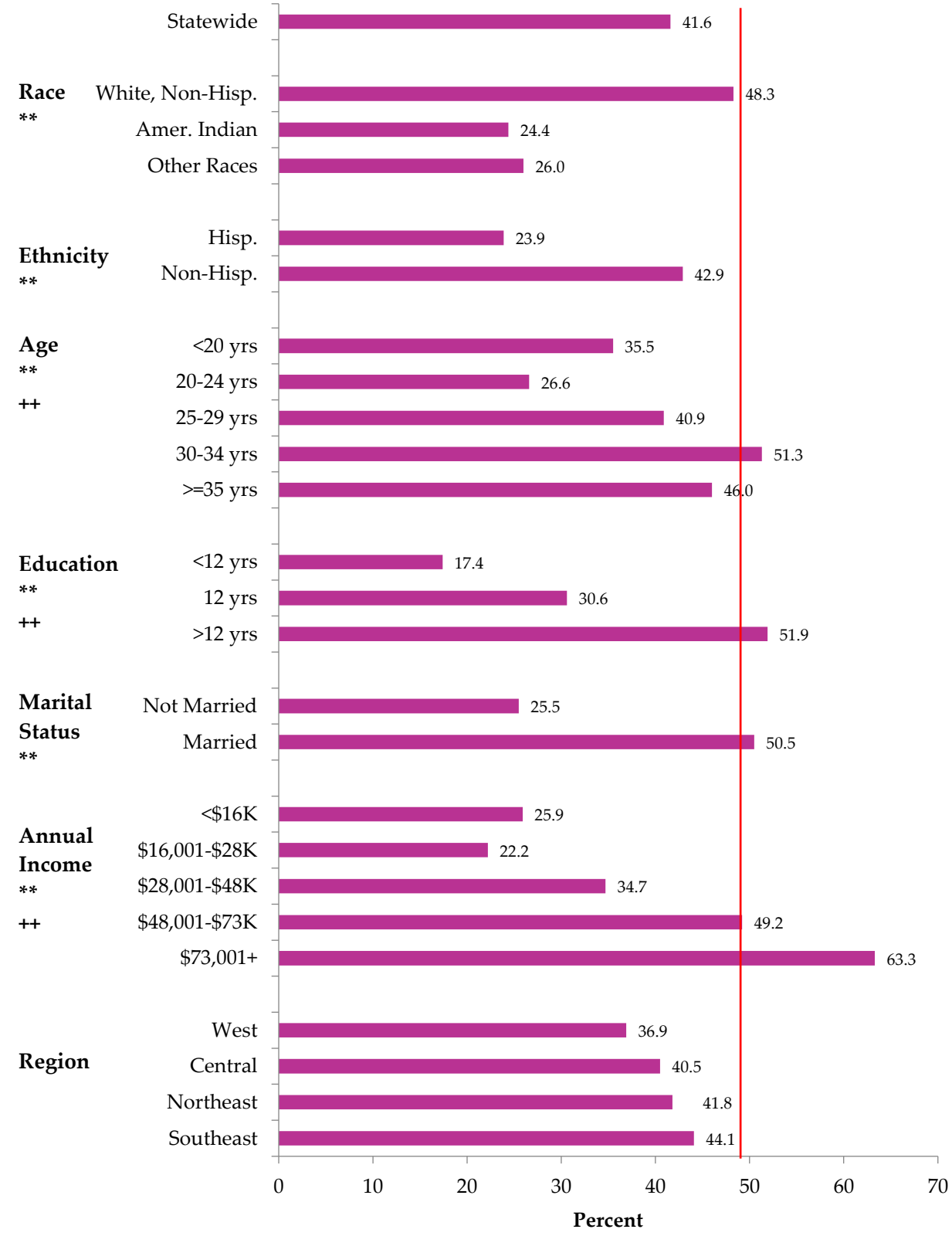
Mothers who had had their teeth cleaned during pregnancy, compared to mothers who did not have their teeth cleaned during pregnancy, were significantly (p-value less than 0.05) *more likely* to report that:

- They drank alcohol the 3 months before pregnancy (74.7% vs. 59.2%).

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 (6.5% vs. 20.1%).
- They smoked the 3 months before pregnancy (12.5% vs. 23.3%).
- They used illicit drugs the 3 months before pregnancy (6.7% vs. 15.4%).
- They started prenatal care after the first trimester or had no prenatal care (8.5% vs. 18.6%).
- They attended fewer than 80% of their prenatal visits (14.6% vs. 20.1%).
- They suffered emotional abuse during pregnancy (1.7%^ vs. 7.2%; interpret with caution).
- Their infant was born low birth weight (3.3%^ vs. 8.5%; interpret percentages with caution).
- Their infant was born preterm (5.7% vs. 11.4%).
- They never breastfed their infant (5.1% vs. 13.6%).
- They had a high ACE score (4+) (14.3% vs. 28.3%).

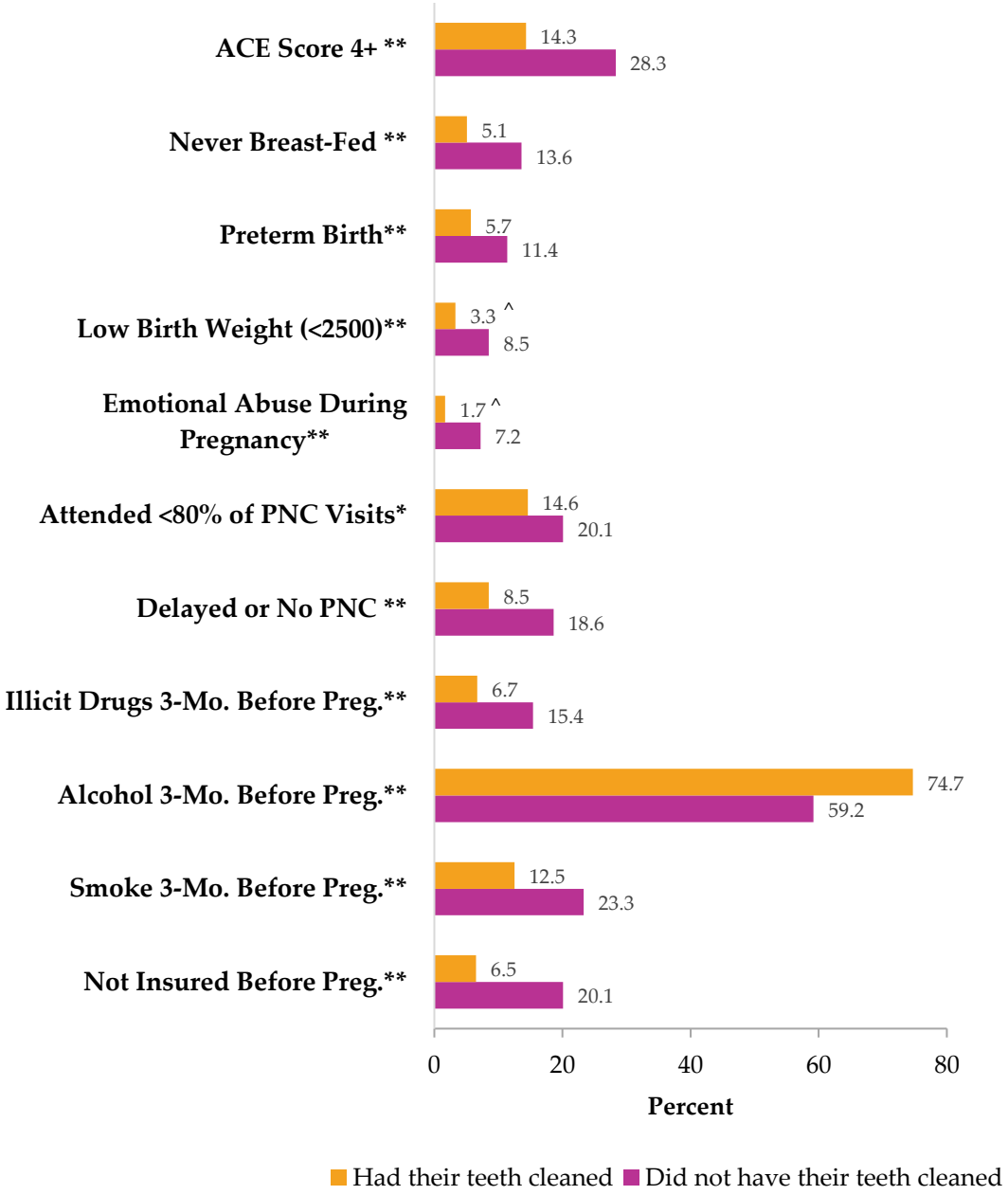
Figure 9.2: Percentage of mothers who had their teeth cleaned during their most recent pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



* 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.

— 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, 2020 (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

References

1. American Dental Association. Oral health during pregnancy. *Journal of the American Dietetic Association* 142(5):574, 2011.
2. Chambrone L, Guglielmetti M, Pannuti C, Chambrone L. Evidence grade associating periodontitis to preterm birth and/or low birth weight: I. A systematic review of prospective cohort studies. *Journal of Clinical Periodontology* 38(9):795-808, 2011.

Chapter 10: Abuse

Measure	% of women (95% CI, N)	
Abuse by partner/husband		
Physical, before pregnancy	1.8	(1.0-2.5, 182)
Physical, during pregnancy	1.8	(1.0-2.5, 181)
Sexual abuse, during pregnancy	0.7	(0.2-1.2, 71)^
Emotional abuse during pregnancy	4.9	(3.5-6.3, 506)
Tried to control daily activities	3.4	(2.2-4.6, 352)
Was threatened or made to feel unsafe	3.1	(2.1-4.2, 323)
Was frightened for her or family's safety	2.5	(1.5-3.5, 256)

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 touching or sexual activity when she did not want to.

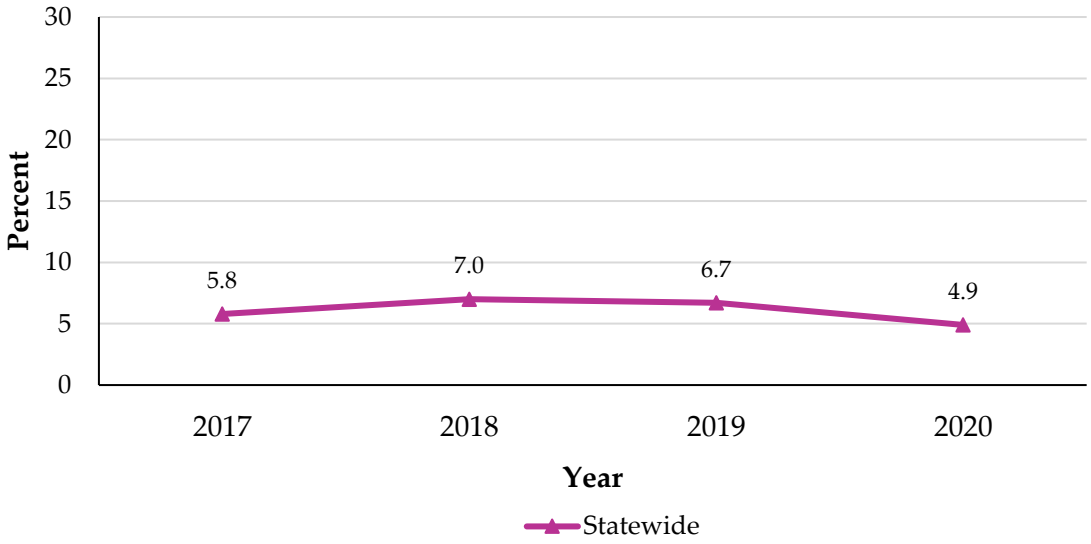
Emotional abuse was defined as the husband/partner either trying to control the mother's daily activities, threatening the mother in a way that made her feel unsafe, or frightening the mother for her or her family's safety.

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 over time (p-value for linear trend greater than 0.05).

Figure 10.1: Mothers who were emotionally abused during pregnancy by year, South Dakota, 2017–2020 (weighted)



Demographic Characteristics (Figure 10.2)

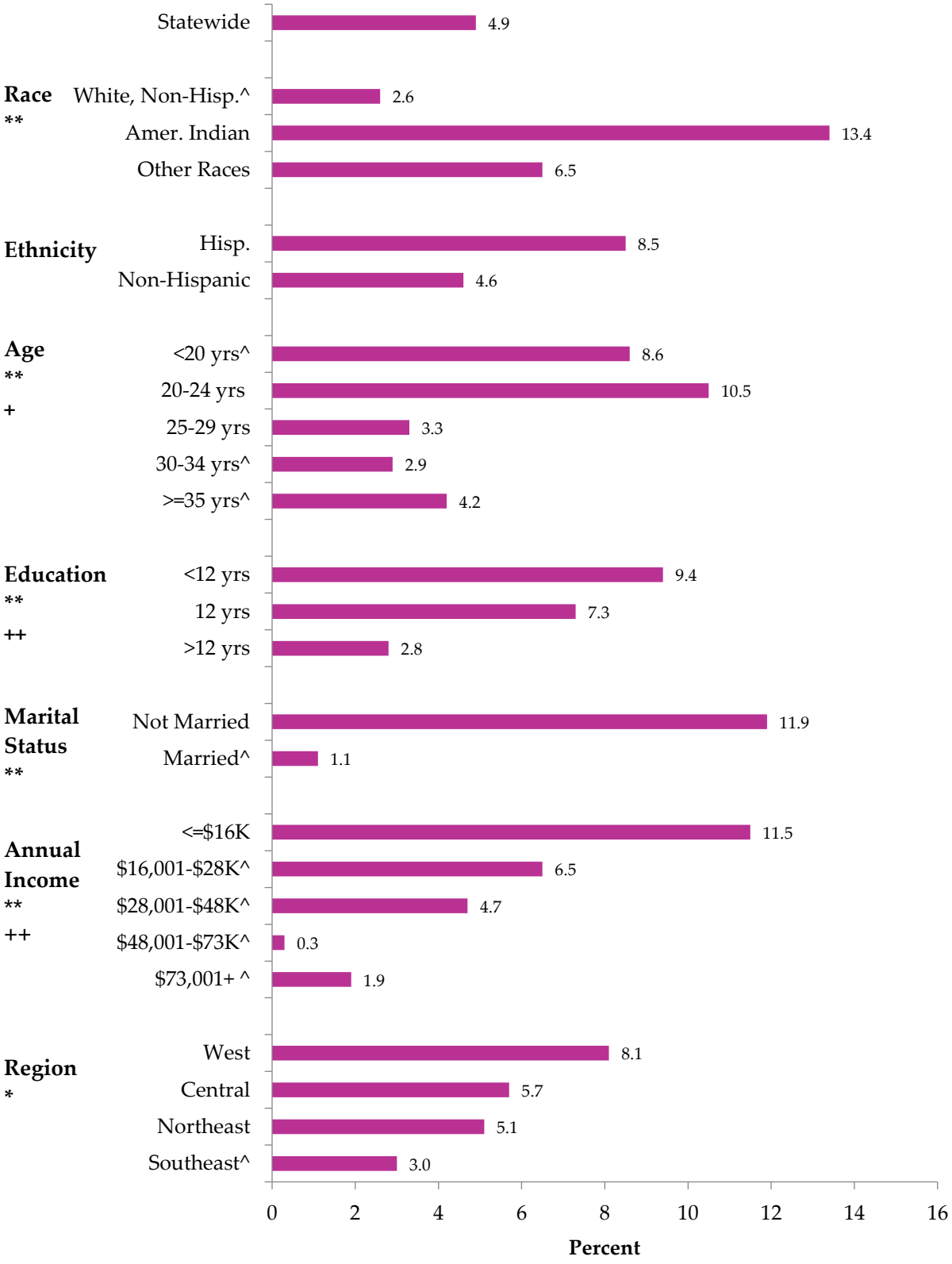
- Overall prevalence of South Dakota mothers who were emotionally abused during pregnancy was 4.9%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with being emotionally abused during pregnancy included maternal race, age, education, marital status, household income and region of the state that the mother resided.
- Mothers who were American Indian, younger, had fewer years of education, were not married, had less household income and resided in the Western region 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:

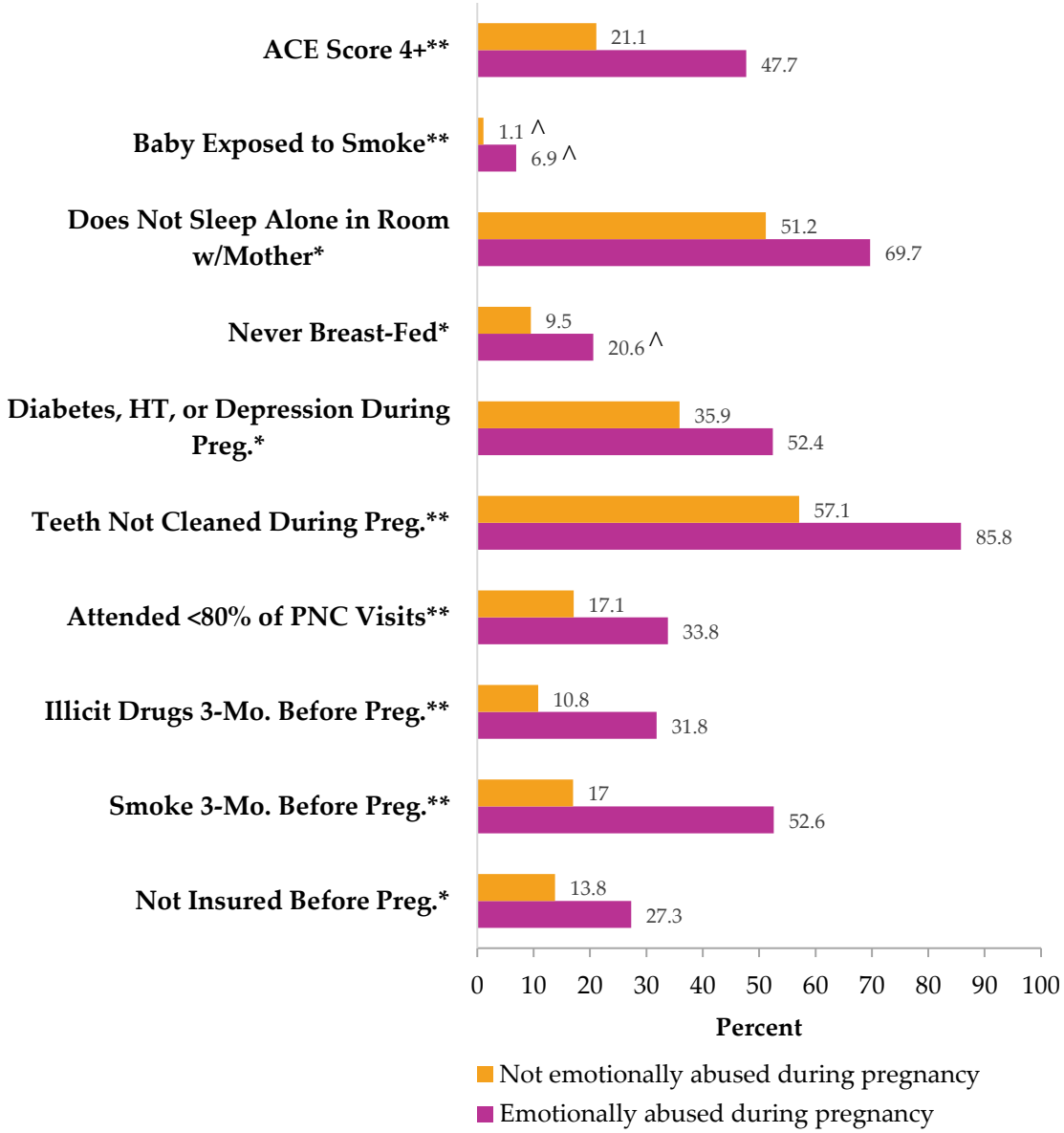
- They were not insured before pregnancy (27.3% vs. 13.8%).
- They smoked the 3 months before pregnancy (52.6% vs. 17.0%).
- They used illicit drugs the 3 months before pregnancy (31.8% vs. 10.8%).
- They attended fewer than 80% of their prenatal visits (33.8% vs. 17.1%).
- They did not have teeth cleaned during pregnancy (85.8% vs. 57.1%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (52.4% vs. 35.9%).
- Their infant was never breast-fed (20.6^% vs. 9.5%; interpret these percentages with caution).
- Their infant does not sleep alone in mother's room (69.7% vs. 51.2%)
- Their baby is exposed to smoke (6.9^% vs. 1.1^%; interpret these percentages with caution).
- They had a high ACE score (4+) (47.7% vs. 21.1%).

Figure 10.2: Percentage of mothers who were emotionally abused during pregnancy by demographic characteristics, South Dakota, 2020 (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).

Figure 10.3: Risk behaviors and outcomes by mothers who were emotionally abused during pregnancy, South Dakota, 2020 (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

References

1. Alhusen JL, Ray E, Sharps P, Bullock L. Intimate partner violence during pregnancy: maternal and neonatal outcomes. *Journal of Women's Health*. 24:100-106, 2015.
2. Pajarita C, Perreira KM. Intimate partner violence during pregnancy and 1-year post-partum. *Journal of Family Violence* 22:609-619, 2017.
3. Malta L, McDonald S, Hegadoren K, Weller C, Tough SC. Influence of interpersonal violence on maternal anxiety, depression, stress, and parenting morale in the early postpartum: A community-based pregnancy cohort study. *BMC Pregnancy and Childbirth* 12:153, 2012.
4. Shah PS, Shah J. Maternal exposure to domestic violence and pregnancy and birth outcomes: A systematic review and meta-analyses. *Journal of Women's Health* 19:2017-2031, 2010.

Chapter 11: Tobacco use

Measure	% of women (95% CI, N)	
Cigarette use, maternal		
In the past 2 years	21.9	(19.1-24.7, 2273)
3 months before pregnancy	18.8	(16.2-21.4, 1945)
Last 3 months of pregnancy	8.7	(6.8-10.6, 902)
Postpartum	12.3	(10.1-14.6, 1274)
Among women who smoked in the past 2 years, amount smoked *3 months before* pregnancy		
None (did not smoke then)	13.3	(8.4-18.2, 298)
Less than 5 cigarettes per day	40.1	(33.2-47.0, 900)
6 to 10 cigarettes per day	26.4	(19.8-33.0, 592)
11 cigarettes or more per day	20.2	(13.7-26.6, 453)
Among women who smoked in the past 2 years, amount smoked *last 3 months* of pregnancy		
None (did not smoke then)	60.1	(52.8-67.3, 1357)
Less than 5 cigarettes per day	27.5	(21.0-34.0, 621)
6 to 10 cigarettes per day	5.8	(2.4-9.3, 132)^
11 cigarettes or more per day	6.6	(2.6-10.7, 149)^
Among women who smoked in the past 2 years, amount smoked *now*		
None (did not smoke then)	42.8	(35.5-50.1, 952)
Less than 5 cigarettes per day	27.5	(21.8-33.2, 613)
6 to 10 cigarettes per day	16.1	(10.2-22.0, 359)
11 cigarettes or more per day	13.6	(7.8-19.4, 303)
Other tobacco use, maternal use among all women		
E-cigarettes or other electronic nicotine products *in past 2 years*	9.0	(6.9-11.1, 930)
Hookah use past 2 years	2.4	(1.3-3.5, 245)
Among women who used e-cigarettes or other nicotine products in the past 2 years, frequency of use the *3 months before* pregnancy*:*		
More than once a day	31.7	(19.7-43.8, 300)
Once a day	5.5	(0.0-11.7, 52)^
2-6 days a week	11.7	(3.1-20.4, 111)^
1 day a week or less	22.1	(12.4-31.7, 209)
Did not use e-cigarette or other electronic nicotine products then	29.0	(18.0-40.0, 274)

^ 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%).

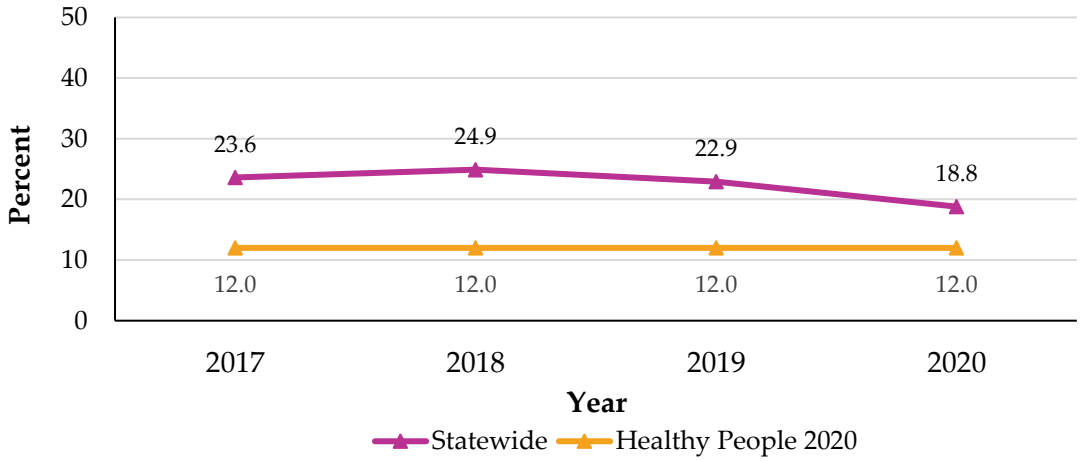
- **MICH 16.3** Increase the proportion of women delivering a live birth who did not smoke prior to pregnancy to 88% *(prevalence of smoking before pregnancy to 12%).*

Smoked Three Months Before Pregnancy

Prevalence and Trends (Figure 11.1)

The percentage of South Dakota mothers who smoked three months before pregnancy **has decreased** over time (p-value for linear trend less than 0.05). The Healthy People 2020 goal of 88% of women delivering a life 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, 2017-2020 (weighted)



Demographic Characteristics (Figure 11.2)

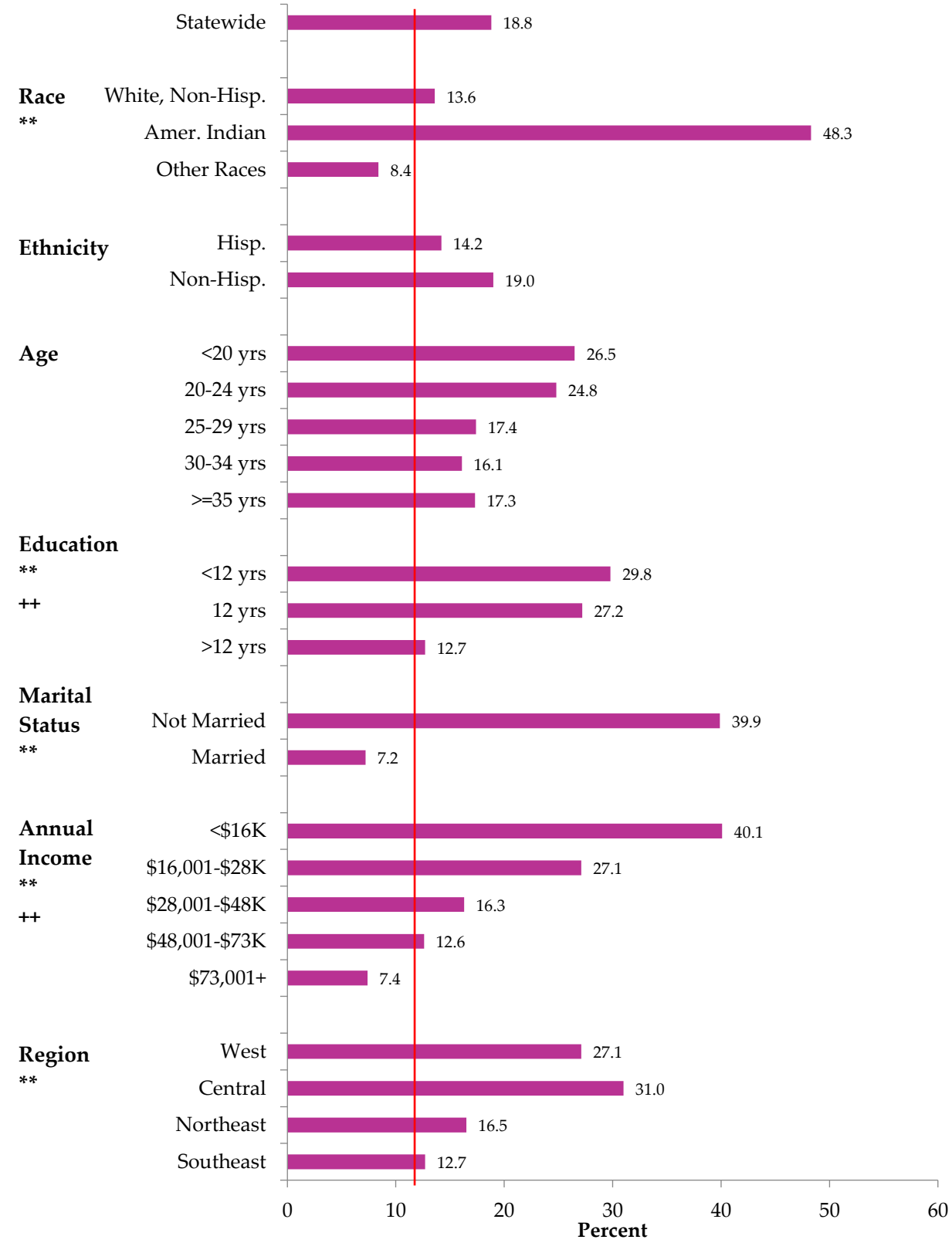
- Overall prevalence of South Dakota mothers who smoked the three months before pregnancy was 18.8%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with smoking the three months before pregnancy included maternal race, education, marital status, household income, and region of the state that the mother resided.
- Mothers who were American Indian, had fewer years of education, were not married, had less household income, and who resided in the Central region of South Dakota had higher prevalence 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 (31.5% vs. 10.6%).
- They drank alcohol the 3 months before pregnancy (74.5% vs. 63.5%).
- They used illicit drugs the 3 months before pregnancy (40.0% vs. 5.0%).
- They attended fewer than 80% of their prenatal visits (26.6% vs. 15.6%).
- They did not have their teeth cleaned during pregnancy (72.4% vs. 55.1%).
- They suffered emotional abuse during pregnancy (13.5% vs. 2.8%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (52.5% vs. 32.8%).
- They never breastfed their infant (19.7% vs. 8.0%).
- Their baby is exposed to smoke (3.9^% vs. 0.8^%; interpret these percentages with caution).
- They had a high ACE score (4+) (44.0% vs. 17.5%).

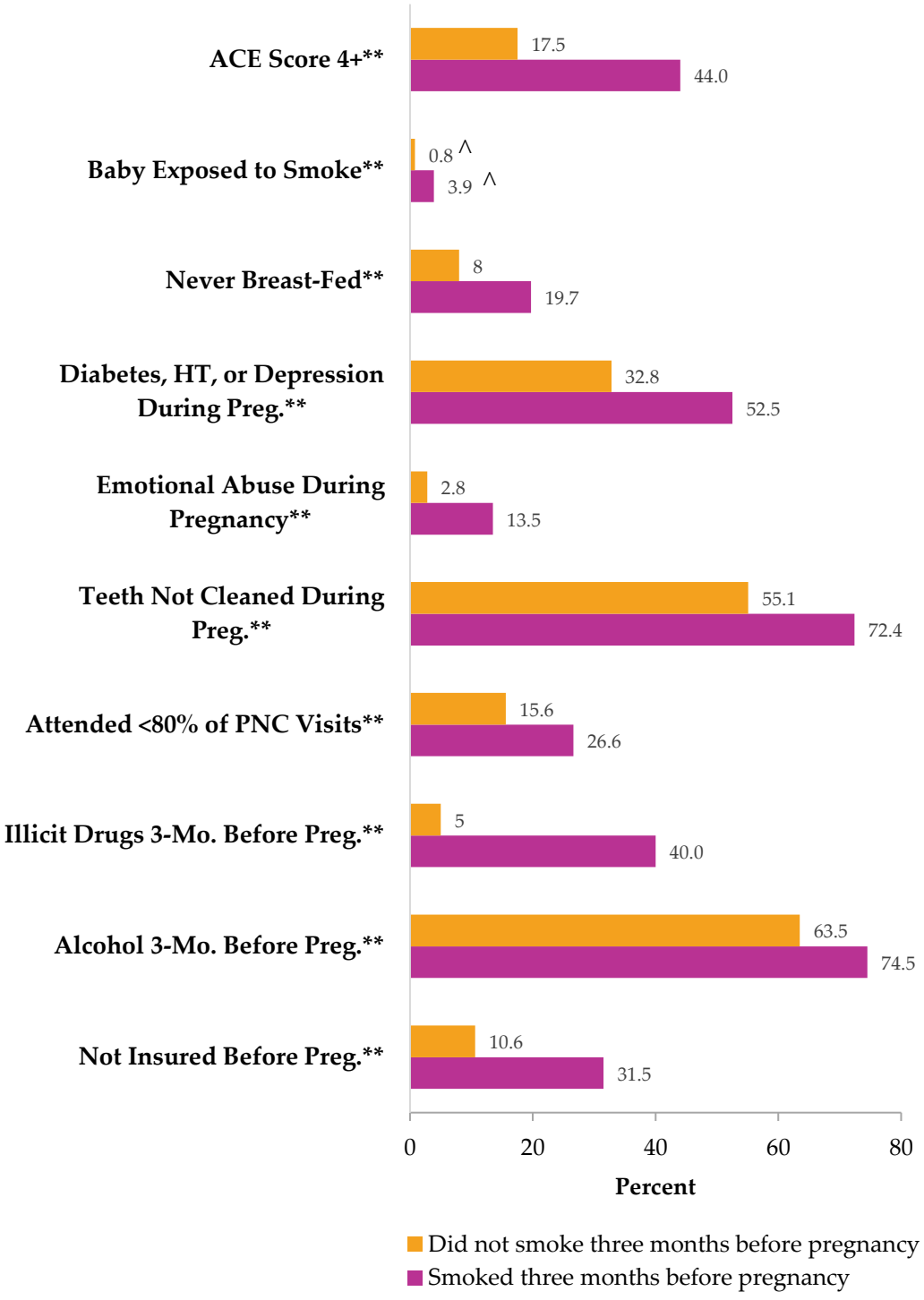
Figure 11.2: Percentage of mothers who smoked the three months before pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



** 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 (12%)

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



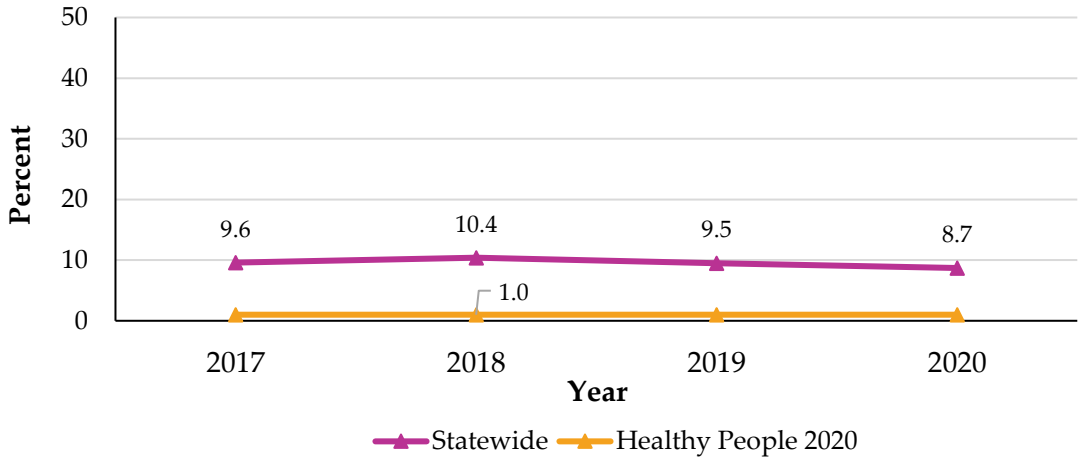
* p-value < 0.05, ** p-value < 0.01 p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care, ACE = adverse childhood experiences

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 has not changed over time (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, 2017-2020 (weighted)



Demographic Characteristics (Figure 11.5)

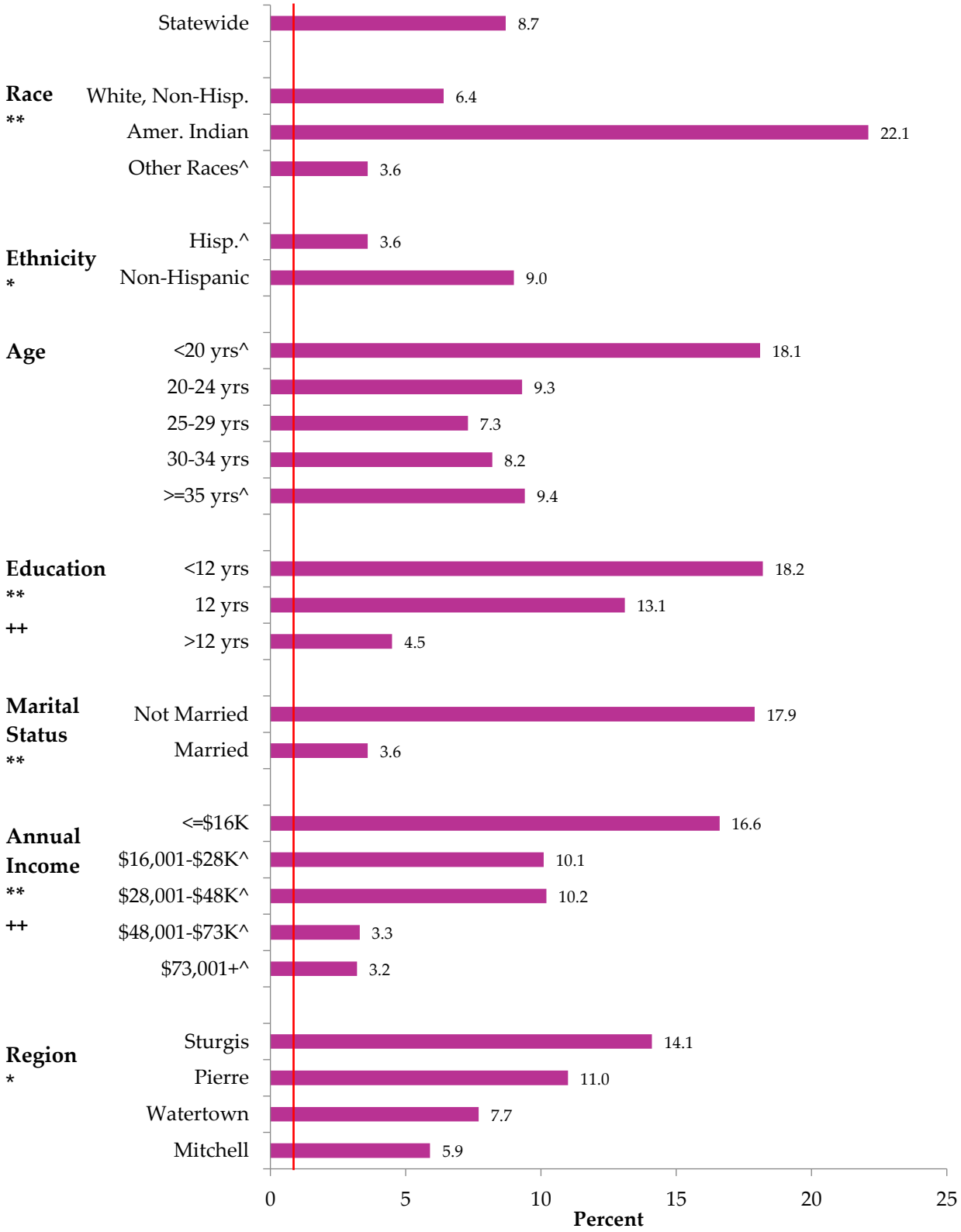
- Overall prevalence of South Dakota mothers who smoked the last three months of pregnancy was 8.7%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with smoking the last three months of pregnancy included maternal race, ethnicity, education, marital status, household income, and region of the state that the mother resided.
- Mothers who were American Indian, non-Hispanic, had less than High School education, were not married, had household income less than $16,000, and who resided in the Western region had higher prevalence 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 not insured before pregnancy (31.0% vs. 12.9%).
- They smoked 3 months before pregnancy (98.4 vs. 11.3%).
- They used illicit drugs the 3 months before pregnancy (48.9% vs. 8.3%).
- They attended fewer than 80% of their prenatal visits (31.3% vs. 16.4%).
- They did not have their teeth cleaned during pregnancy (76.1% vs. 56.8%).
- They suffered emotional abuse during pregnancy (17.7% vs. 3.6%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (66.0% vs. 33.8%).
- Their infant was born preterm (17.0% vs. 8,2%).
- They never breastfed their infant (24.7% vs. 8.8%).
- Their baby is exposed to smoke (6.8^% vs. 0.9^%%; interpret these percentages with caution).
- They had a high ACE score (4+) (42.5% vs. 20.5%).

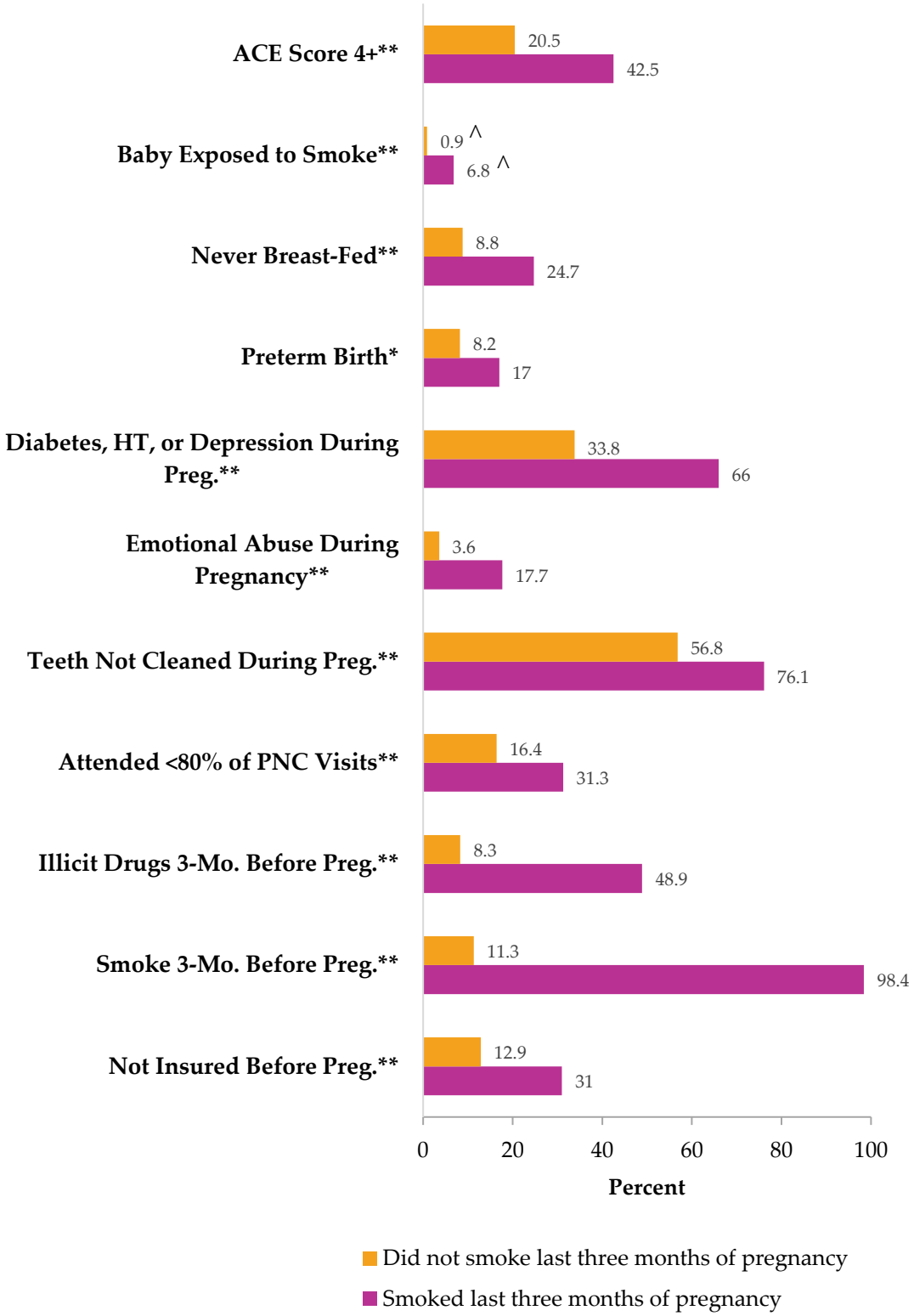
Figure 11.5: Percentage of mothers who smoked the last three months of pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



* 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.
^ 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, 2020 (weighted)



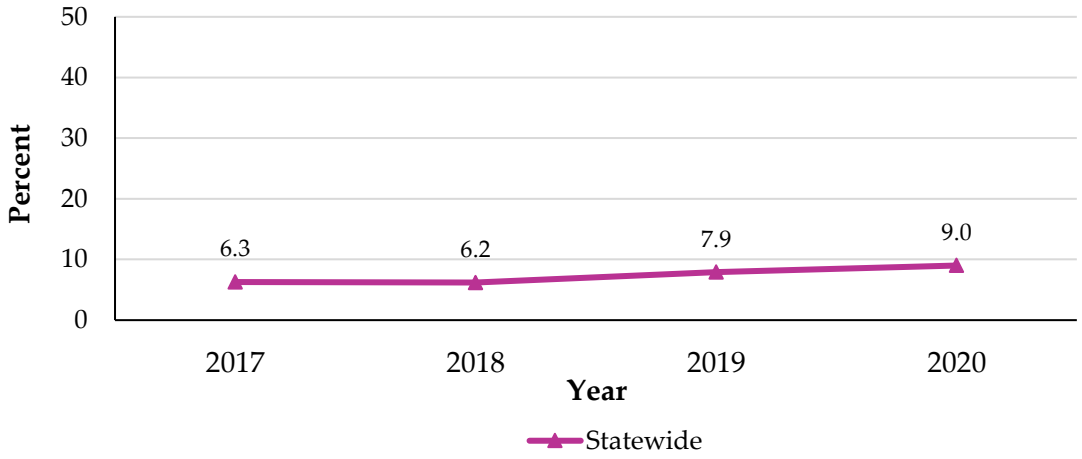
* p-value < 0.05, ** p-value < 0.01, p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care; ACE = adverse childhood experiences

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 increased** over time (p-value for linear trend less 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, 2017-2020 (weighted)



Demographic Characteristics (Figure 11.8)

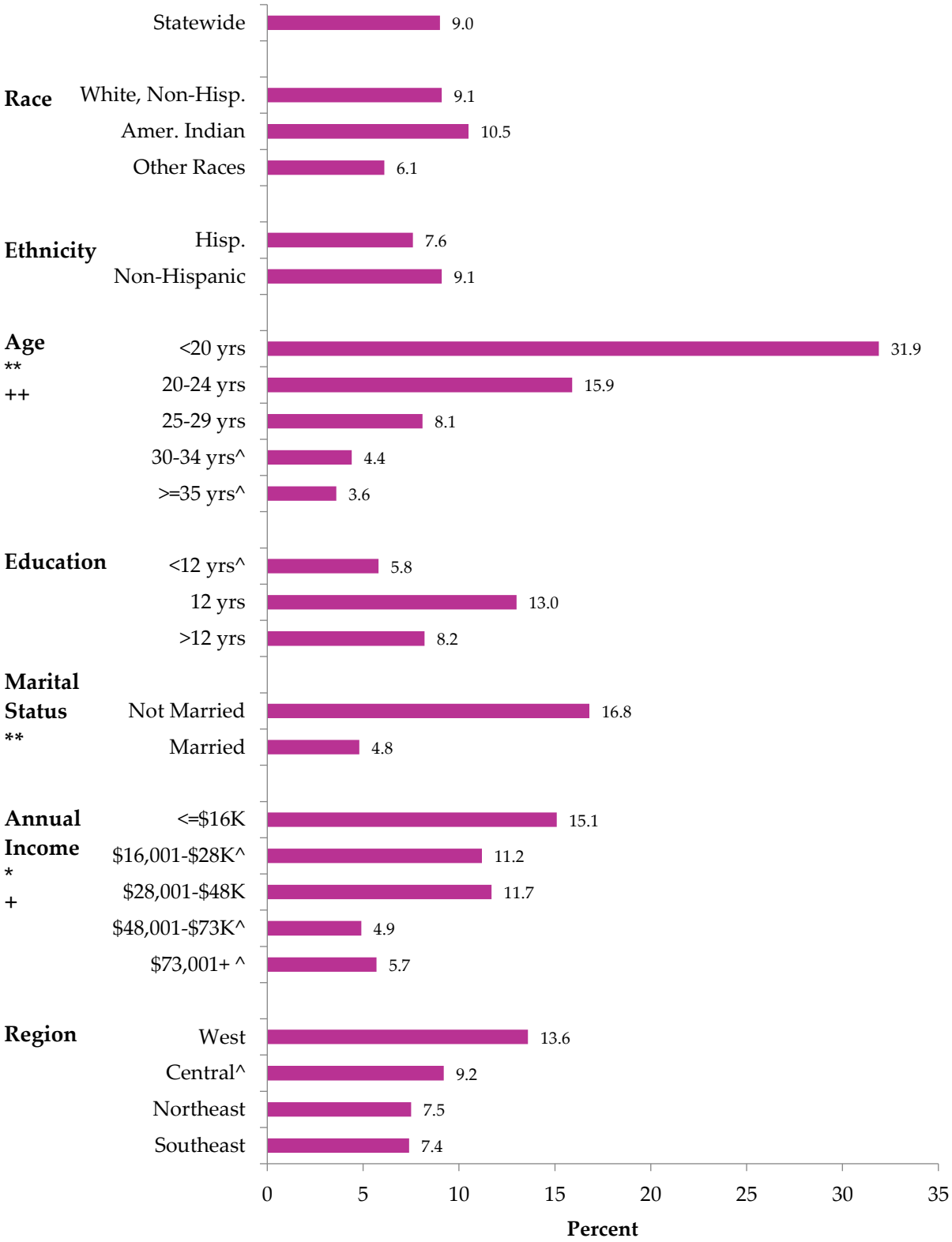
- Overall prevalence of South Dakota mothers who used e-cigarettes or other electronic nicotine products in the last two years was 9.0%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with using e-cigarettes in the last two years included maternal age, marital status, and household income.
- Mothers who were less than 20 years old, were not married and who had less household income had higher prevalence 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:

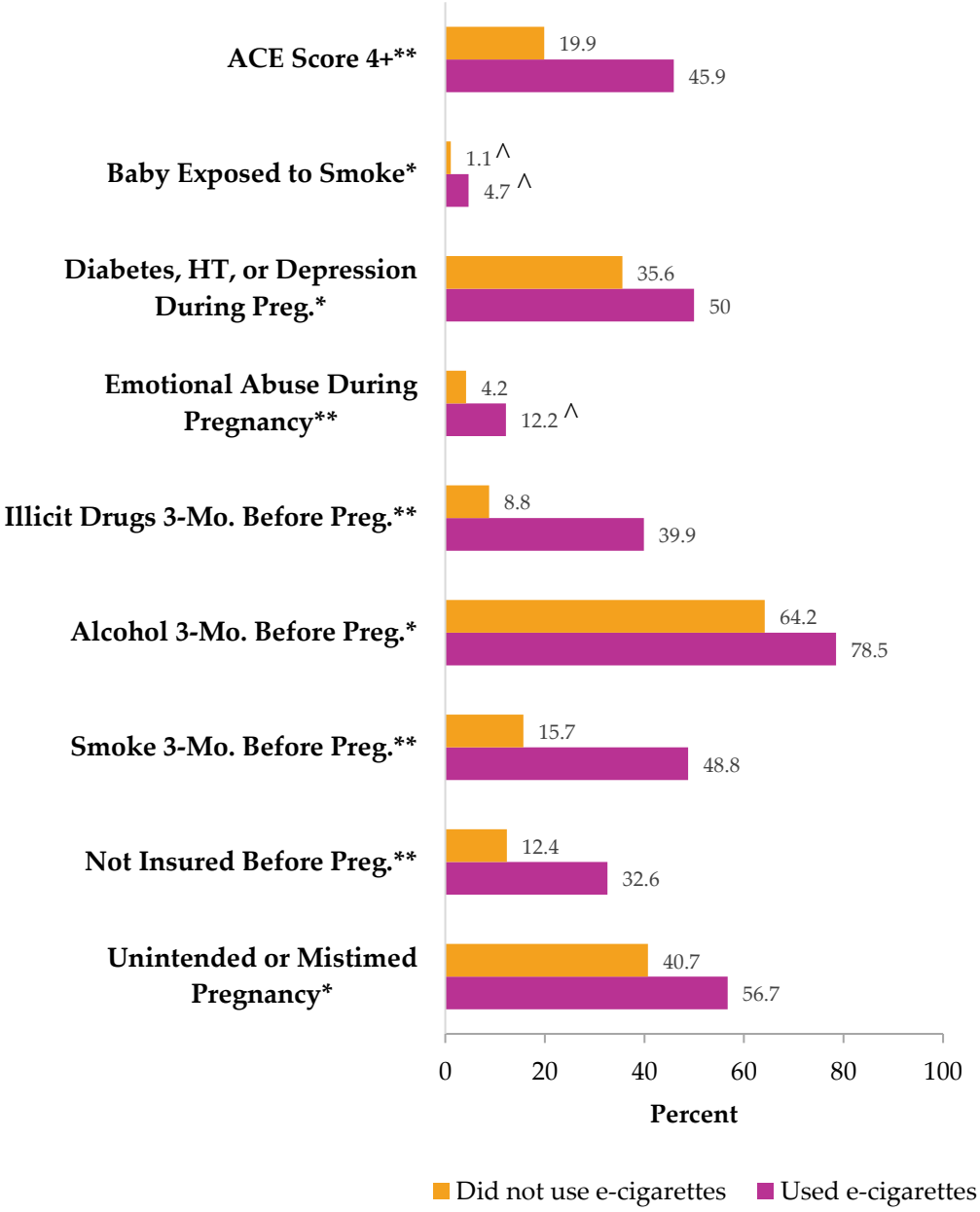
- They had unintended or mistimed pregnancy (56.7% vs. 40.7%).
- They were not insured before pregnancy (32.6% vs. 12.4%).
- They smoked the 3 months before pregnancy (48.8% vs. 15.7%).
- They drank alcohol the 3 months before pregnancy (78.5% vs. 64.2%).
- They used illicit drugs the 3 months before pregnancy (39.9% vs. 8.8%).
- They suffered emotional abuse during pregnancy (12.2^% vs. 4.2%; interpret these percentages with caution).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (50.0% vs. 35.6%).
- Their infant was exposed to smoke (4.7^% vs. 1.1^%; interpret these percentages with caution).
- They had a high ACE score (4+) (45.9% vs. 19.9%).

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, 2020 (weighted)



* p-value < 0.05, ** 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).

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, 2020 (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).

References

1. Ion R, Bernal AL. Smoking and preterm birth. *Reproductive Science* 22(8):918-26, 2015.
2. Chan Y L, Saad S, Al-Odat I, Zaky AA, Oliver B, Pollock C, Li W, Jones NM, Chen H. Impact of maternal cigarette smoke exposure on brain and kidney health outcomes in female offspring. *Clinical and Experimental Pharmacology and Physiology* 43(12):1168-1176, 2016.
3. Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE, Cousens S, Mathers C, Black RE. Global, regional, and national causes of child mortality in 2000-13, with projections to inform post-2015 priorities: An updated systematic analysis. The Lancet 385:430-440, 2015.

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

Measure	% of women (95% CI, N)	
Change in smoking status during pregnancy		
Non-smoker	81.1	(78.5-83.7, 8390)
Smoker who quit	10.4	(8.3-12.4, 1074)
# Cigarettes reduced	5.6	(3.9-7.3, 578)
# Cigarettes same or more	2.8	(1.8-3.8, 288)
Among mothers who smoked the three months before pregnancy,		
Quit status around the time of pregnancy		
Did not quit	7.7	(3.0-12.4, 139)^
Did not quit, but cut back	32.6	(24.6-40.7, 587)
Yes, before they found out they were pregnant	9.2	(3.9-14.4, 165)
Yes, when they found out they were pregnant	41.6	(33.4-49.8, 748)
Quit later in pregnancy	8.9	(4.8-13.0, 160)
Barriers to quitting		
Cravings for a cigarette	69.1	(61.4-76.8, 1240)
Other people smoking around her	60.0	(51.9-68.1, 1080)
Loss of a way to handle stress	59.2	(51.0-67.4, 1065)
Not wanting to quit	43.4	(35.0-51.8,779)
Lack of support from others to quit	27.5	(20.0-35.1, 493)
Fear of gaining weight	19.5	(12.5-26.5, 351)
Cost of medicines or products to help with quitting	17.2	(10.4-24.0, 308)
Cost of classes to help with quitting	16.1	(9.7-22.6, 289)
Relapse rate at the time of the survey among women who smoked before pregnancy and quit during pregnancy	38.0	(28.1-47.9, 408)

^ 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

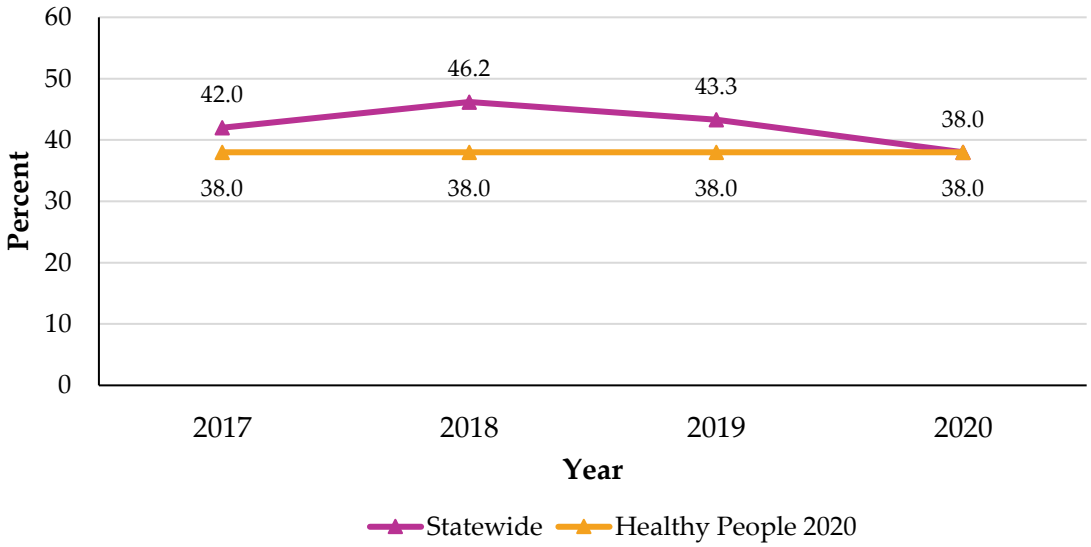
- **TU-6** Increase smoking cessation during pregnancy to 30%.
- **MICH-18** Reduce postpartum relapse of smoking among women who quit smoking during pregnancy to 38%.

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 over time (p-value for linear trend greater than 0.05). The Healthy People 2020 goal of 38% was achieved in 2020.

Figure 12.1: Mothers who quit smoking during pregnancy and had relapsed at the time the survey was completed by year, South Dakota, 2017–2020 (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 38.0%.
- The only demographic characteristic that was significantly (p-value less than 0.05) associated with smoking relapse was maternal education.
- Mothers who had a High School education had a higher prevalence of relapse compared with their counterparts.

Risk Behaviors and Outcomes (Figure 12.3)

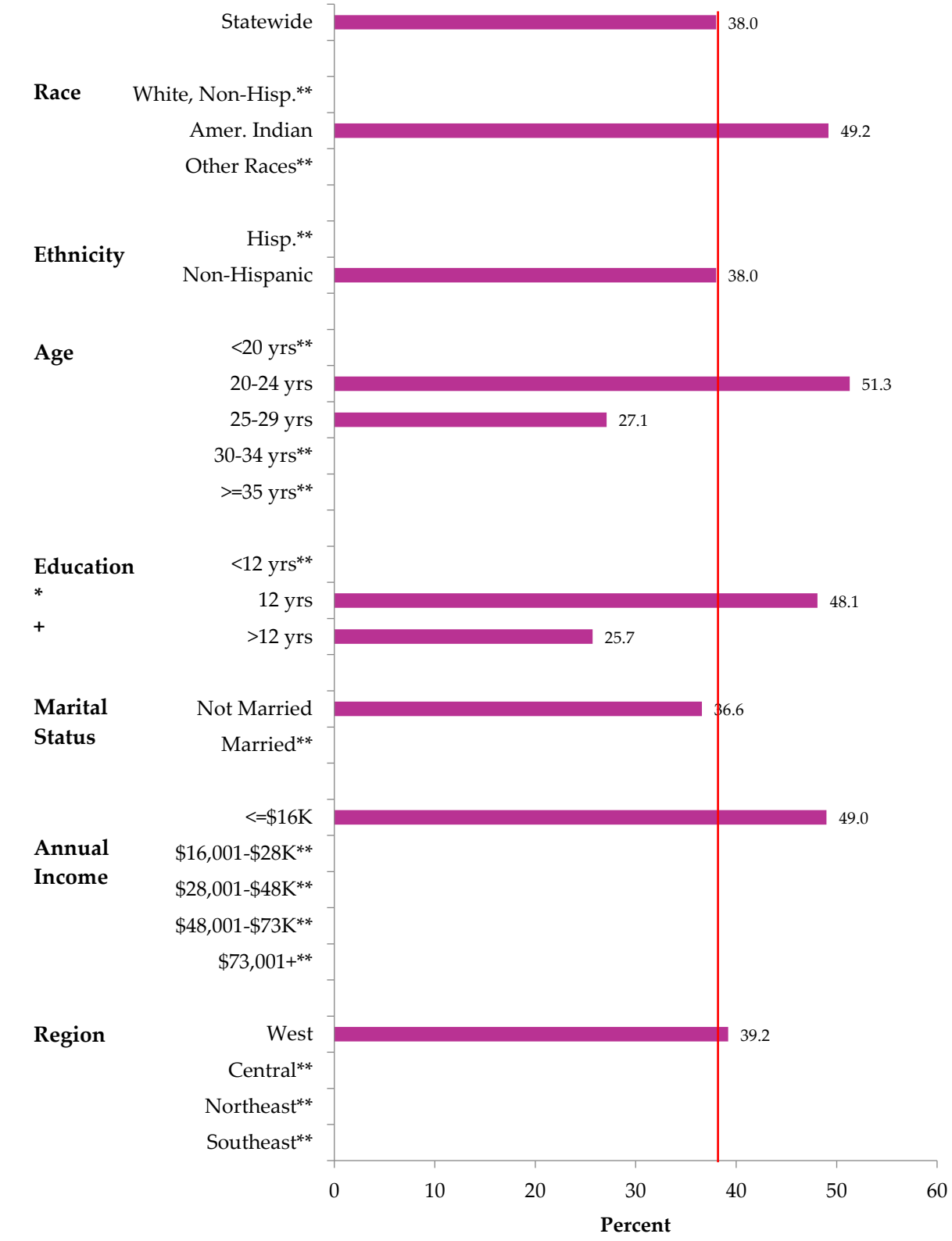
Mothers who quit smoking during pregnancy and head relapsed at the time the survey was completed were significantly (p-value less than 0.05) *more likely* to report that:

- Their infant was never breastfed (31.1% vs. 6.9^%; interpret these percentages with caution).

Mothers who quit smoking during pregnancy and head relapsed at the time the survey was completed were significantly (p-value less than 0.05) *less likely* to report that:

- They were not insured before pregnancy (18.8^% vs. 38.5%; interpret these percentages with caution).
- They drank alcohol 3 months before pregnancy (75.3% vs. 87.9%).

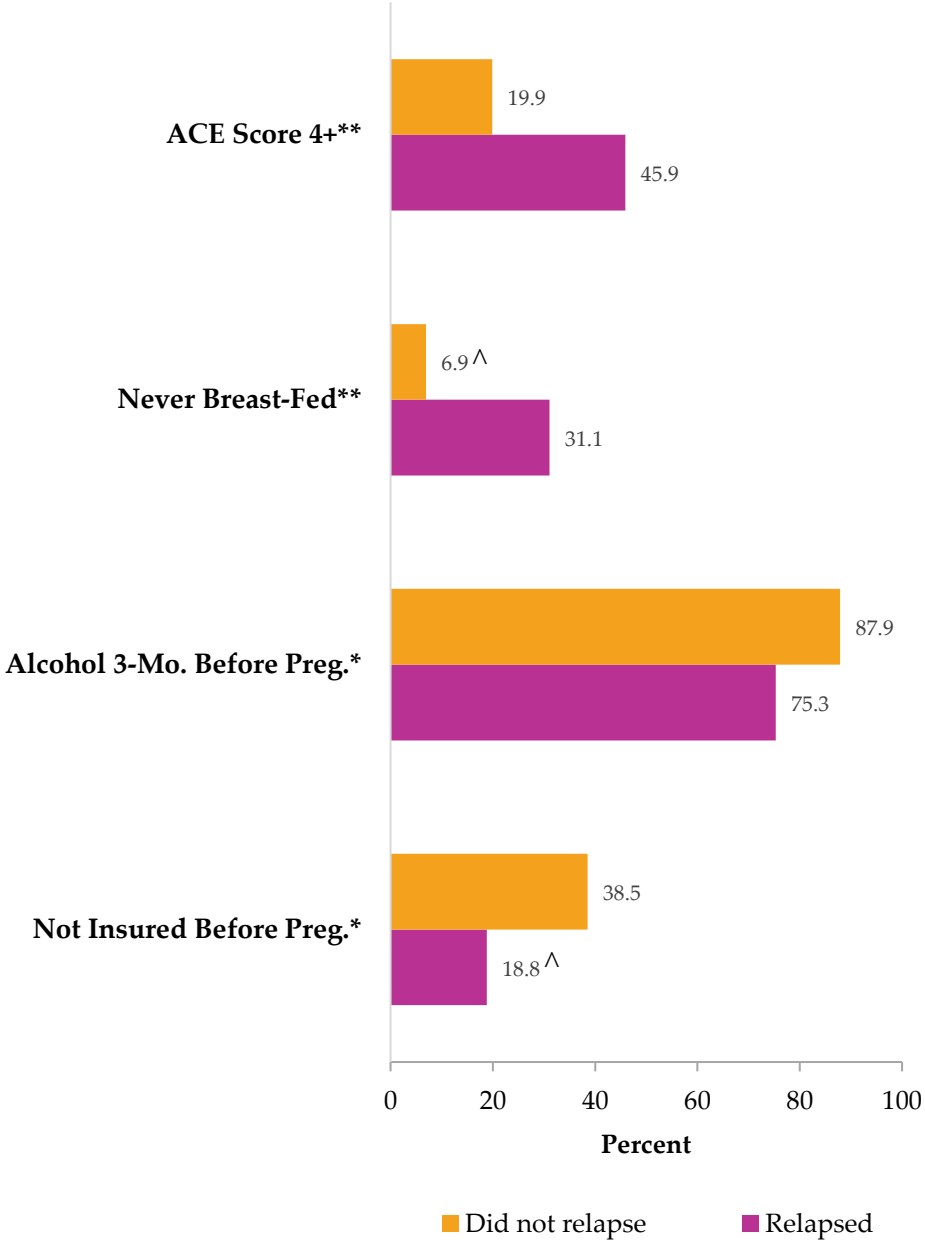
Figure 12.2: Percentage of mothers who quit smoking during pregnancy and had relapsed at the time the survey was completed by demographic characteristics, South Dakota, 2020 (weighted)



* 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.
** 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, 2020 (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).

References

4. Ion R, Bernal AL. Smoking and preterm birth. *Reproductive Science* 22(8):918-26, 2015.

5. Chan Y L, Saad S, Al-Odat I, Zaky AA, Oliver B, Pollock C, Li W, Jones NM, Chen H. Impact of maternal cigarette smoke exposure on brain and kidney health outcomes in female offspring. *Clinical and Experimental Pharmacology and Physiology* 43(12):1168-1176, 2016.

6. Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE, Cousens S, Mathers C, Black RE. Global, regional, and national causes of child mortality in 2000-13, with projections to inform post-2015 priorities: An updated systematic analysis. The Lancet 385:430-440, 2015.

Chapter 13: Environmental smoke exposure and actions of the health care provider

Measure	% of women (95% CI, N)
Among women whose infant is alive, living with her and not in the hospital,	
Infant not around someone who smokes	98.6 (97.8-99.4, 9886)
Among women who smoked in the 3 months before pregnancy,	
Was advised to quit smoking by a health care provider	80.1 (73.7-86.5, 1450)
Actions of the health care provider:	
Referred to a national or state quit line	36.6 (28.2-45.0, 637)
Spent time discussing how to quit smoking	37.0 (28.6-45.5, 644)
Provided booklets, videos, or other materials to help quit smoking	30.8 (23.1-38.5, 536)
Suggested attending a class or program to stop smoking	17.8 (11.3-24.3, 309)

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?

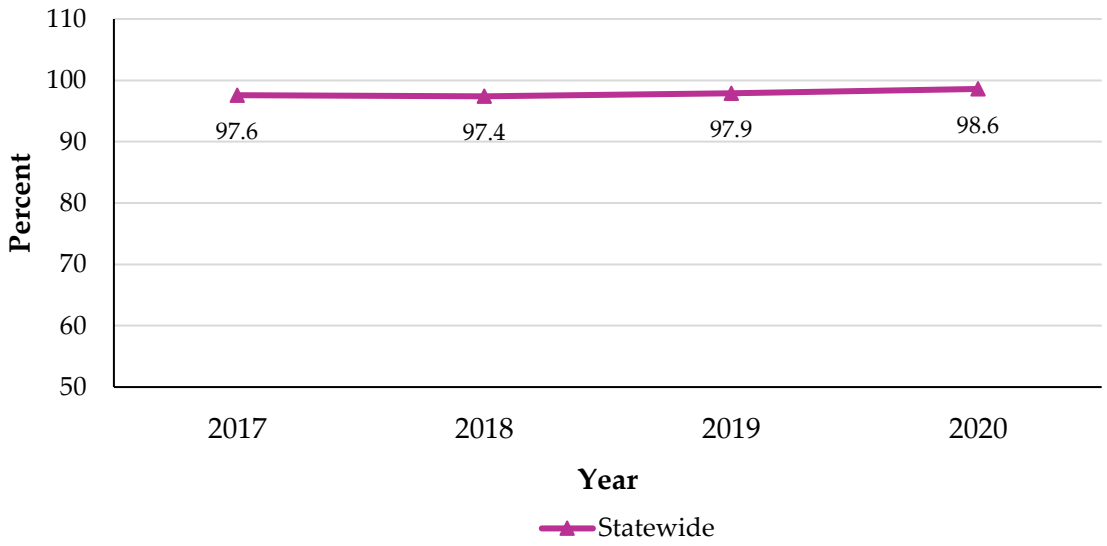
Q33 Listed below are some things about quitting smoking that a doctor, nurse, or other health care worker might have done *during any of your prenatal care visits*. [List]

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 over time (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, 2017–2020 (weighted)



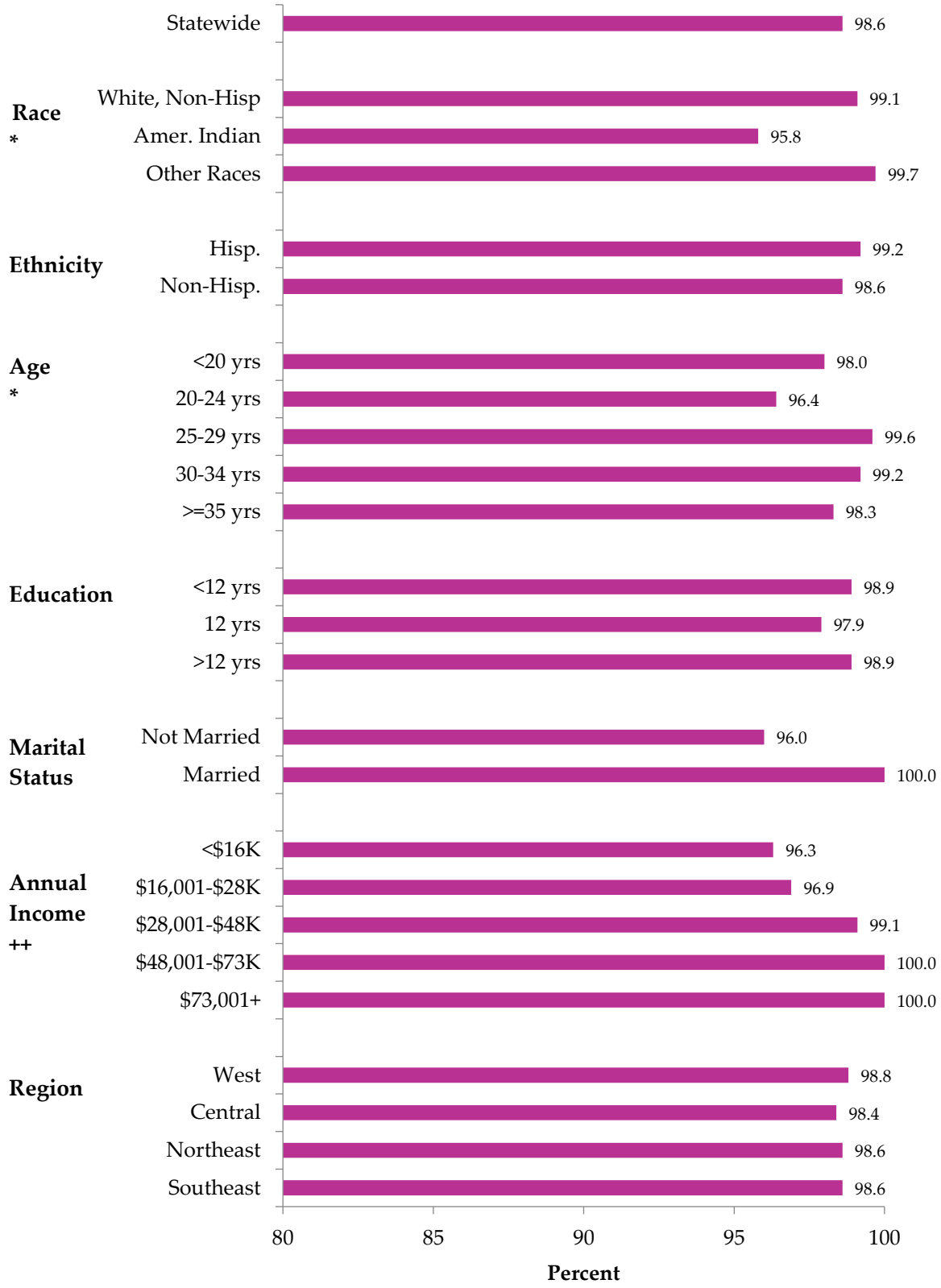
Demographic Characteristics (Figure 13.2)

- 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 98.6%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with having their baby in an enclosed space with someone who smoked included maternal race and age.
- Mothers who were not American Indian and who were not 20-24 years old had a higher prevalence of stating that their infant was not in an enclosed space with anyone who smoked compared with their counterparts.

Risk Behaviors and Outcomes (Figure 13.3)

Risk behaviors and outcomes are not given by whether the infant is 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, 2020 (weighted)



* 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.

Chapter 14: Alcohol use

Measure	% of women (95% CI, N)	
Alcohol use		
Among all women, had any alcoholic drinks in the *past 2 years*	73.4	(70.4-76.3, 7598)
Among all women, had any alcoholic drinks the 3 months before pregnancy	65.6	(62.4-68.8, 6797)
Among all women, had any alcoholic drinks the last 3 months of pregnancy	13.3	(10.9-15.8, 1380)
Alcohol use before pregnancy		
Among women who drank in the past 2 years, amount drank the **3 months before pregnancy**		
Did not drink then	10.6	(8.0-13.1, 803)
Less than 1 drink a week	43.8	(39.5-48.1, 3330)
1 to 3 drinks a week	28.1	(24.3-32.0, 2138)
4 to 7 drinks a week	12.4	(9.5-15.3, 942)
8 or more drinks a week	5.1	(3.2-6.9, 386)
Among women who drank in the 3 months before pregnancy, number of times they drank 4 alcoholic drinks or more in a 2-hour time span		
Never	59.1	(54.6-63.6, 3992)
1 time	14.3	(11.2-17.5, 969)
2 to 3 times	20.2	(16.5-24.0, 1366)
4 to 5 times	3.3	(1.8-4.8, 223)
6 or more times	3.0	(1.4-4.6, 203)
Alcohol use during pregnancy		
Among women who drank in the past 2 years, amount drank the **last 3 months of pregnancy**		
Did not drink then	81.8	(78.5-85.1, 6205)
Less than 1 drink a week	11.4	(8.7-14.1, 864)
1 or more drinks a week	6.8	(4.7-8.9, 516)

^ 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

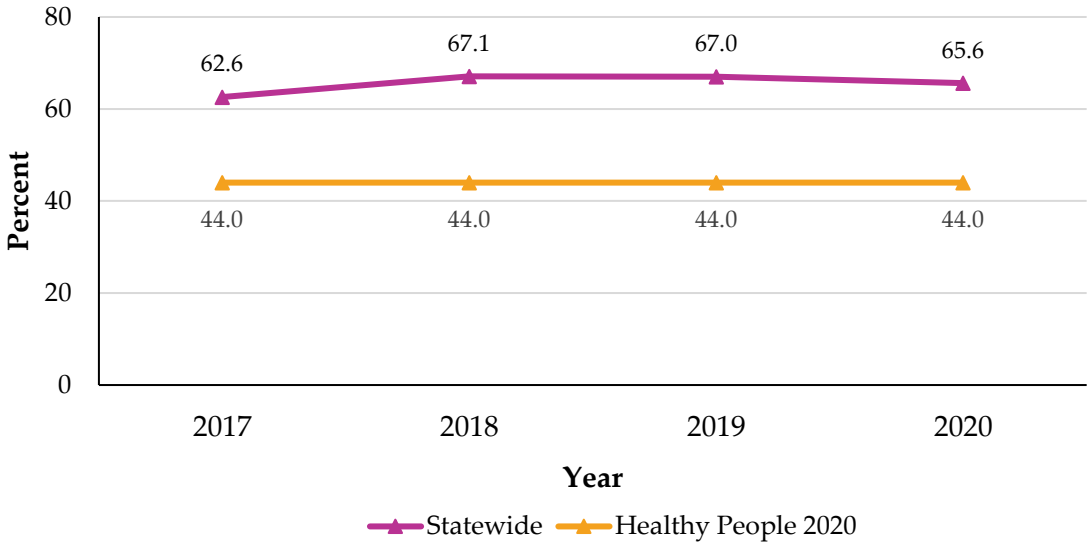
- **MICH-11.1** Increase abstinence from alcohol among pregnant women to 98% (*2% who drink alcohol*).
- **MICH-16.4** Increase the proportion of women delivering a live birth who did not drink alcohol prior to pregnancy to 56% (*44% who drink alcohol*).

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 not changed over time (p-value for linear trend greater than to 0.05). 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, 2017–2020 (weighted)



Demographic Characteristics (Figure 14.2)

- Overall prevalence of South Dakota mothers who drank the three months before pregnancy was 65.6%.
- 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, between 25-29 years of age, had greater than High School education, were married, and had household income greater than $73,000 had a higher prevalence of drinking alcohol the three months before pregnancy compared with their counterparts.

Risk Behaviors and Outcomes (Figure 14.3)

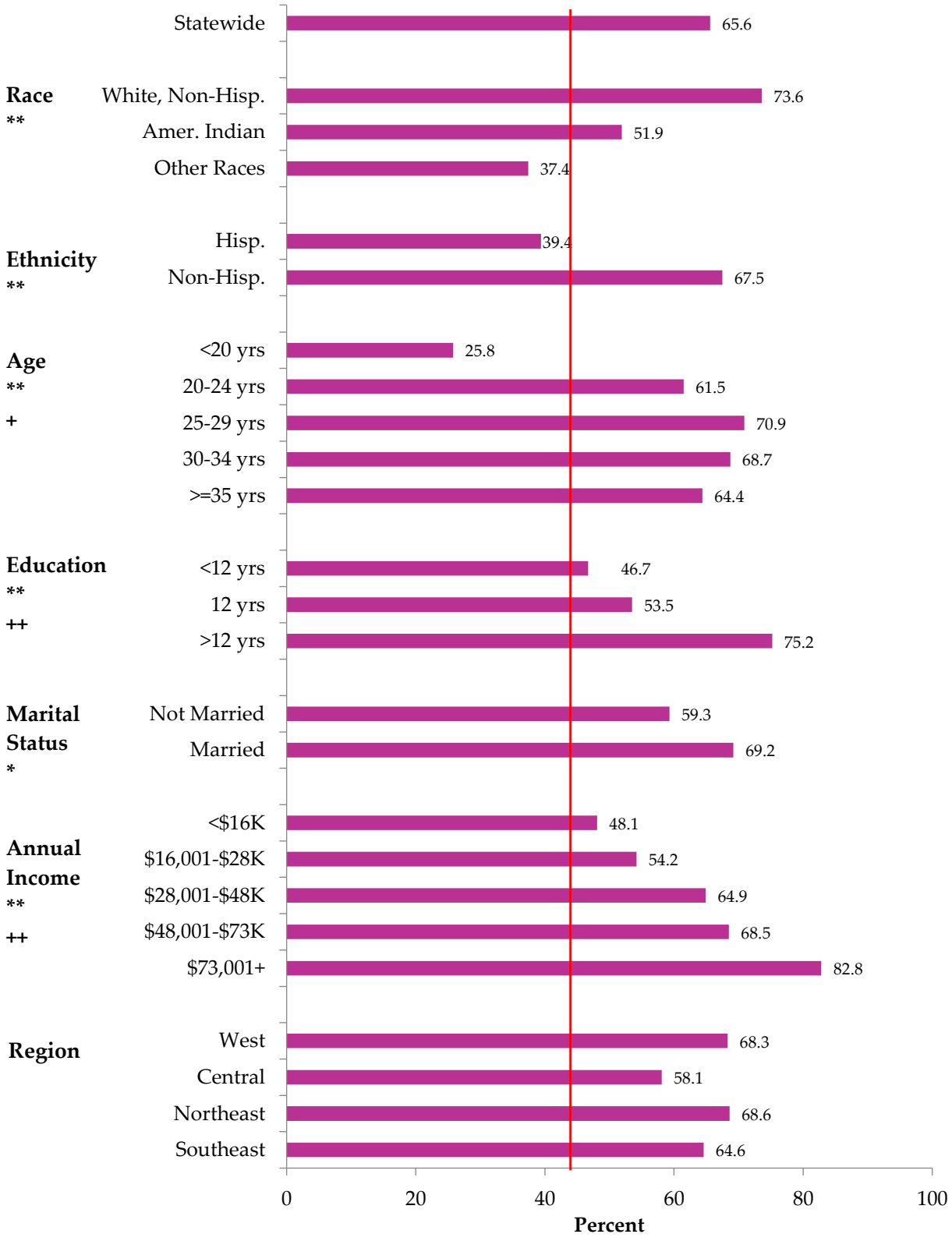
Mothers who drank alcohol before pregnancy, compared to mothers who did not drink alcohol the three months before pregnancy, were significantly (p-value less than 0.05) *more likely* to report that:

- They smoked the 3 months before pregnancy (21.4% vs. 13.9%).

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 (11.4% vs. 20.0%).
- They started prenatal care after the first trimester or had no prenatal care (11.6% vs. 19.6%).
- They did not have their teeth cleaned during pregnancy (52.6% vs. 69.3%).
- They never breastfed their infant (7.4% vs. 15.4%).

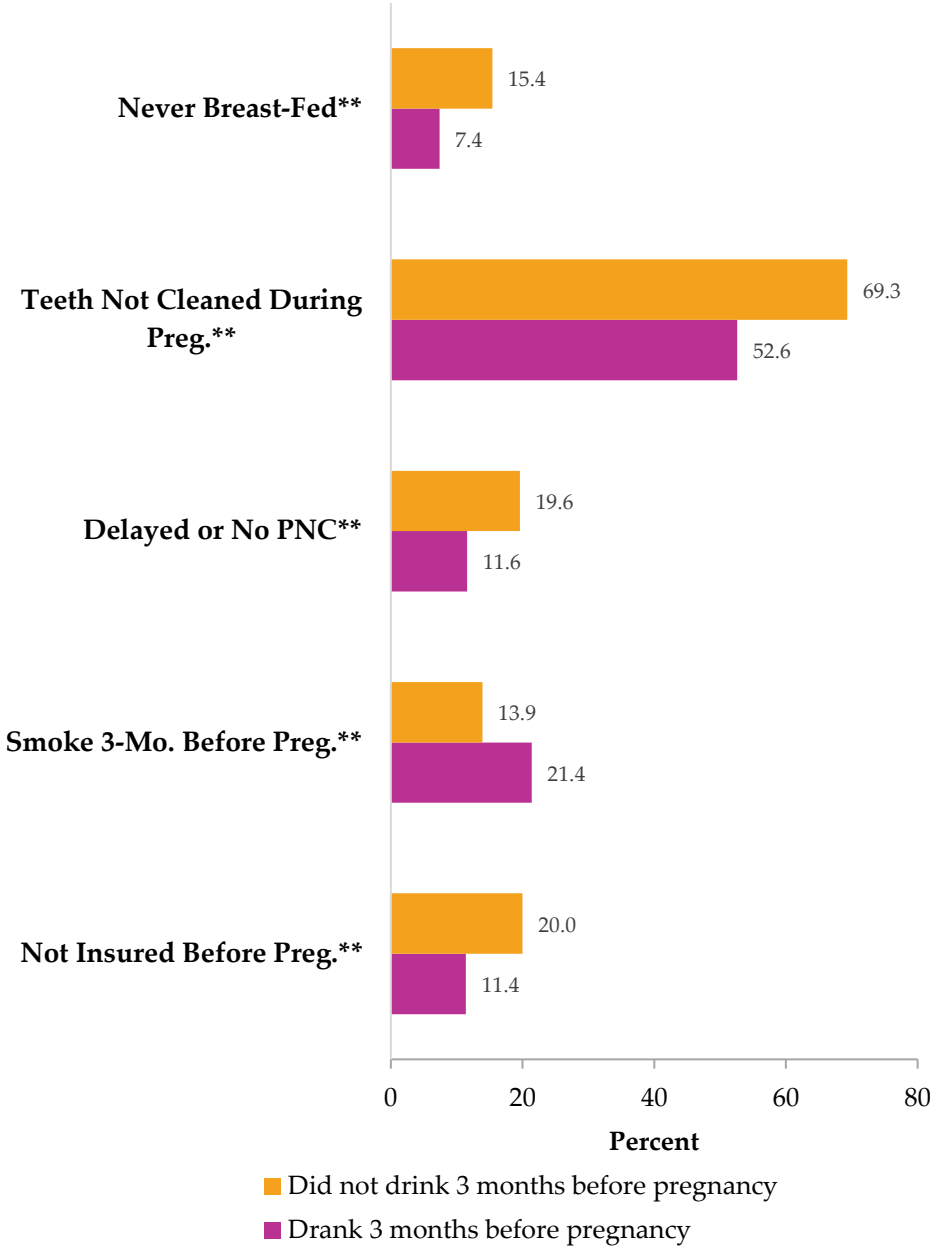
Figure 14.2: Percentage of mothers who drank the three months before pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



* 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.

— 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, 2020 (weighted)



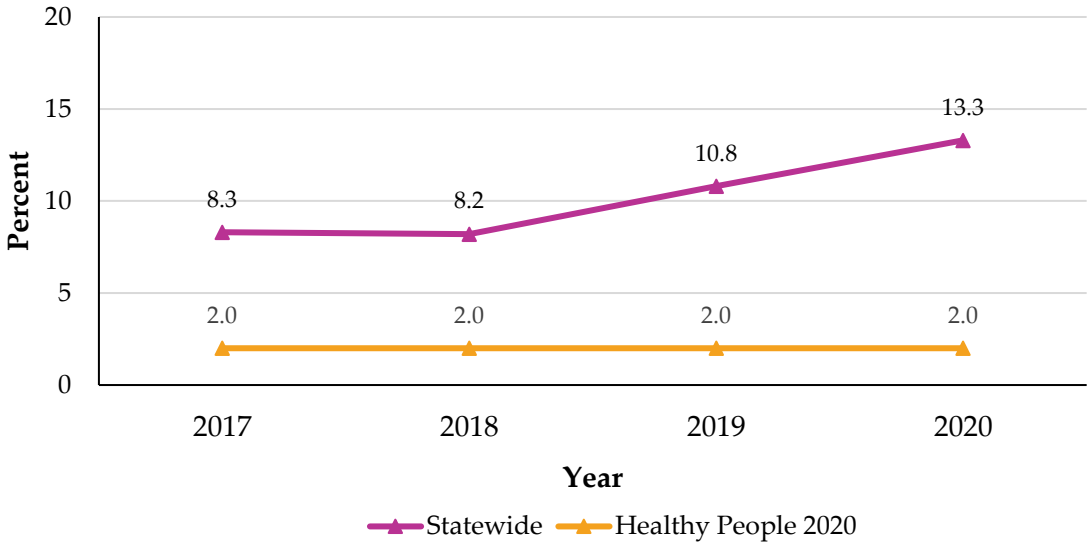
* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
PNC = prenatal care

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 increased** over time (p-value for linear trend less 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, 2017–2020 (weighted)



Demographic Characteristics (Figure 14.5)

- Overall prevalence of South Dakota mothers who drank the last three months of pregnancy was 13.3%.
- The demographic characteristic that was significantly (p-value less than 0.05) associated with drinking the last three months of pregnancy was household income.
- Mothers who had a household income between of $28,001 to $48,000 had a higher prevalence of drinking the last three months of pregnancy compared with counterparts.

Risk Behaviors and Outcomes (Figure 14.6)

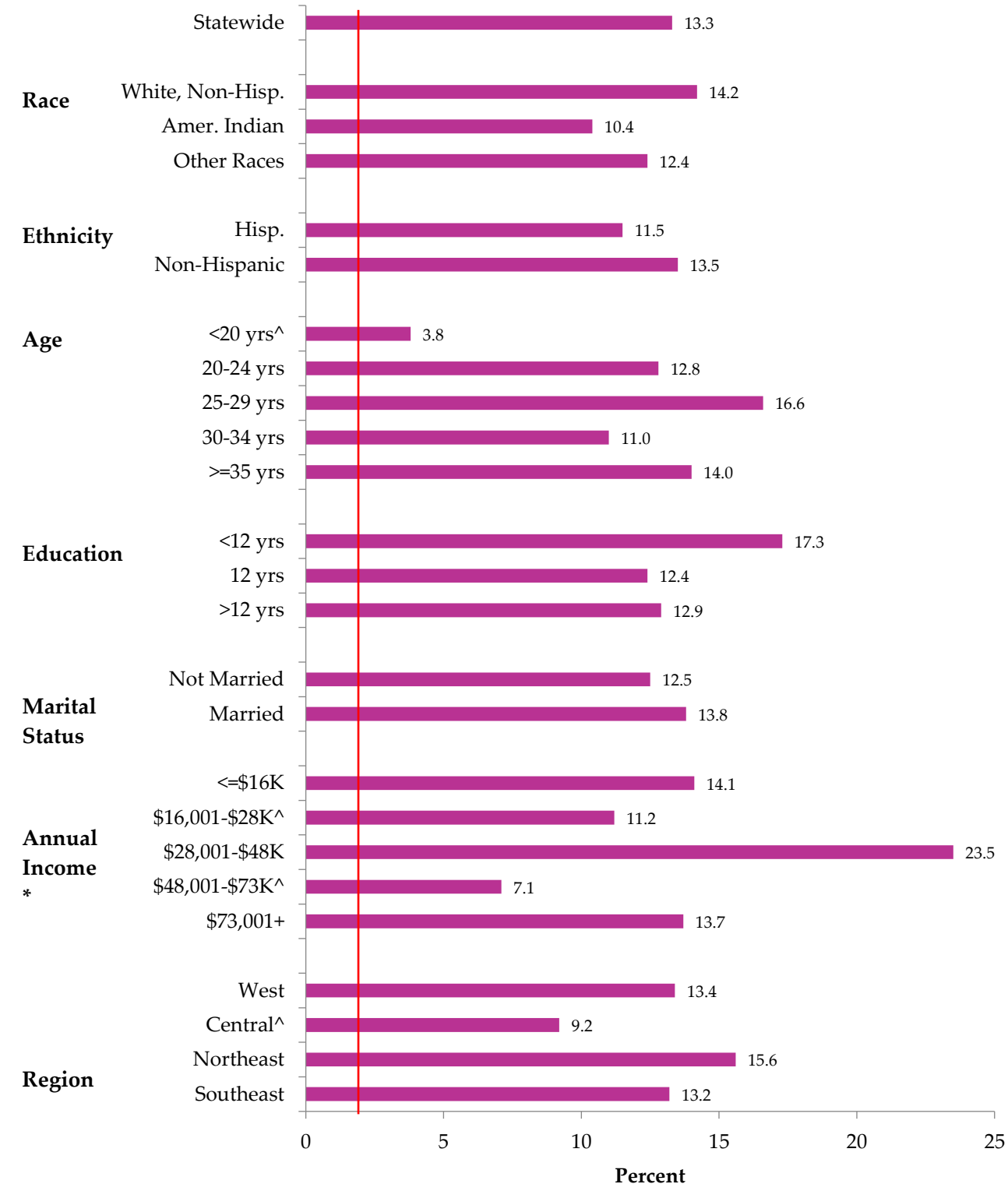
Mothers who drank alcohol during pregnancy, compared to mothers who did not drink alcohol during pregnancy, were significantly (p-value less than 0.05) *more* likely to report that:

- They drank alcohol 3 months before pregnancy (98.2% vs. 60.6%).

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

- They had a preterm birth (3.0^% vs. 10.0%; interpret these percentages with caution).

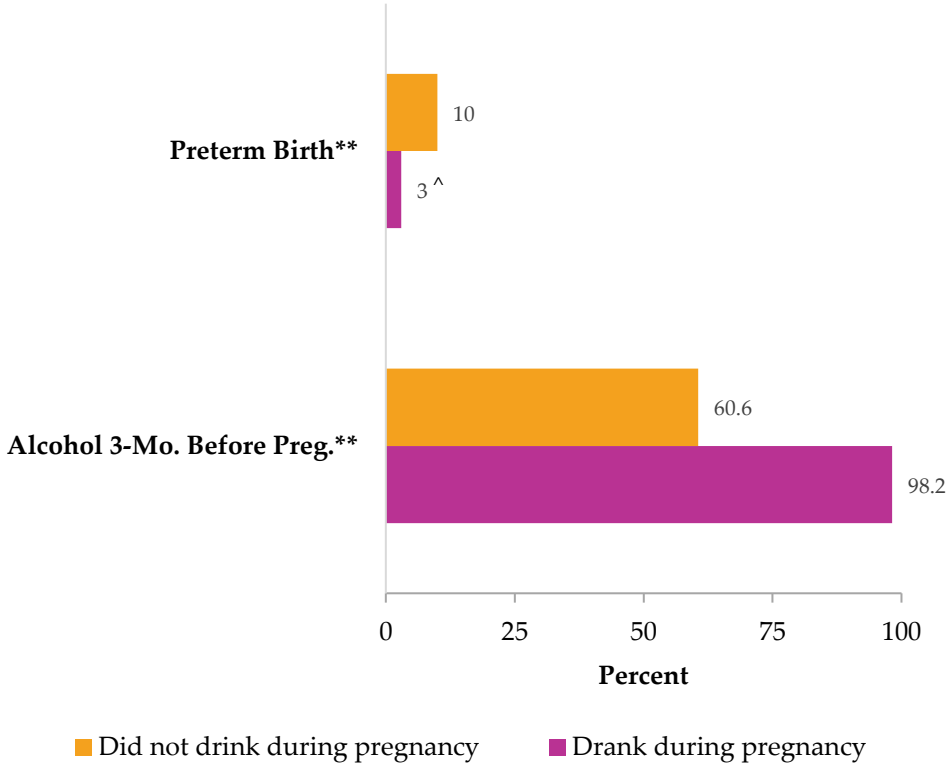
Figure 14.5: Percentage of mother who drank during pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



* p-value < 0.05, ** p-value < 0.01 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).

— Healthy People 2020 (98% abstinence - *2% who drink*)

Figure 14.6: Risk behaviors and outcomes by mothers who drank during pregnancy, South Dakota, 2020 (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).

References

1. Streissguth AP, Bookstein FL, Barr HM, Sampson PD, O'Malley K, Young JK. Risk factors for adverse life outcomes in fetal alcohol syndrome and fetal alcohol effects. *Developmental and Behavioral Pediatrics* 3:228-238, 2004.

Chapter 15: Drug Use

Measure	% of women (95% CI, N)	
Drug use before pregnancy *		
Over-the-counter pain relievers (aspirin, Tylenol®, etc.)	69.6	(66.4-72.8, 7148)
Marijuana or hash	10.3	(8.3-12.3, 1052)
Adderall®, Ritalin®, or another stimulant	2.5	(1.3-3.7, 255)
Prescription pain relievers (hydrocodone, oxycodone, etc.)	2.4	(1.4-3.5, 249)
Amphetamines (speed, crystal meth, ice, etc.)	2.3	(1.2-3.4, 236)
Any illicit drugs#	11.8	(9.6-13.9, 1168)
Drug use during pregnancy *		
Over-the-counter pain relievers (aspirin, Tylenol®, etc.)	70.5	(67.4-73.6, 7217)
Marijuana or hash	5.9	(4.4-7.4, 601)
Prescription pain relievers (hydrocodone, oxycodone, etc.)	2.9	(1.7-4.1, 295)
Amphetamines (speed, crystal meth, ice, etc.)	1.3	(0.6-2.0, 132)
Any illicit drugs#	6.9	(5.3-8.5, 687)

* 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

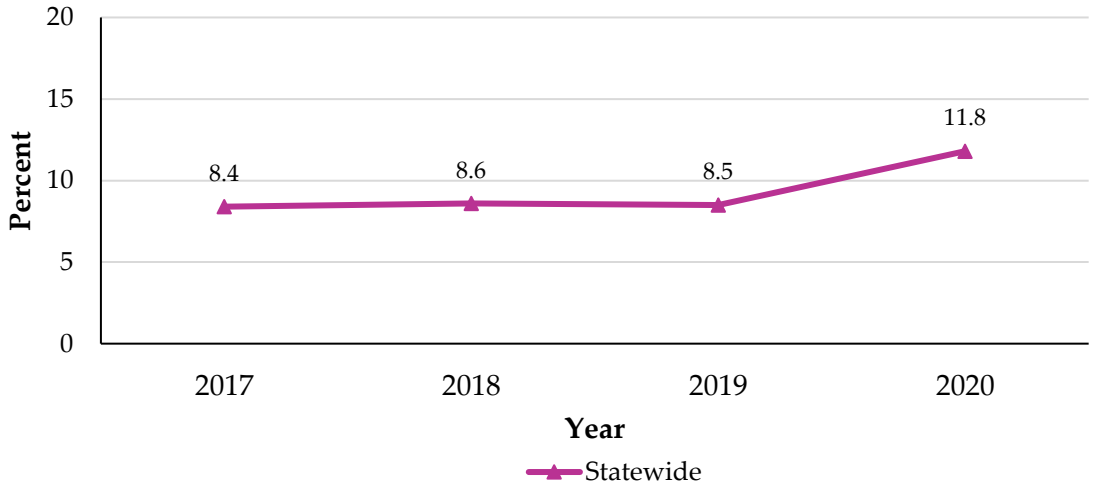
- **MICH-11.4** Increase abstinence from illicit drugs among pregnant women to 100% (*0% for illicit drug use*).

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 increased** over time (p-value for linear trend less than 0.05).

Figure 15.1: Mothers who used any illicit drugs before pregnancy by year, South Dakota, 2017–2020 (weighted)



Demographic Characteristics (Figure 15.2)

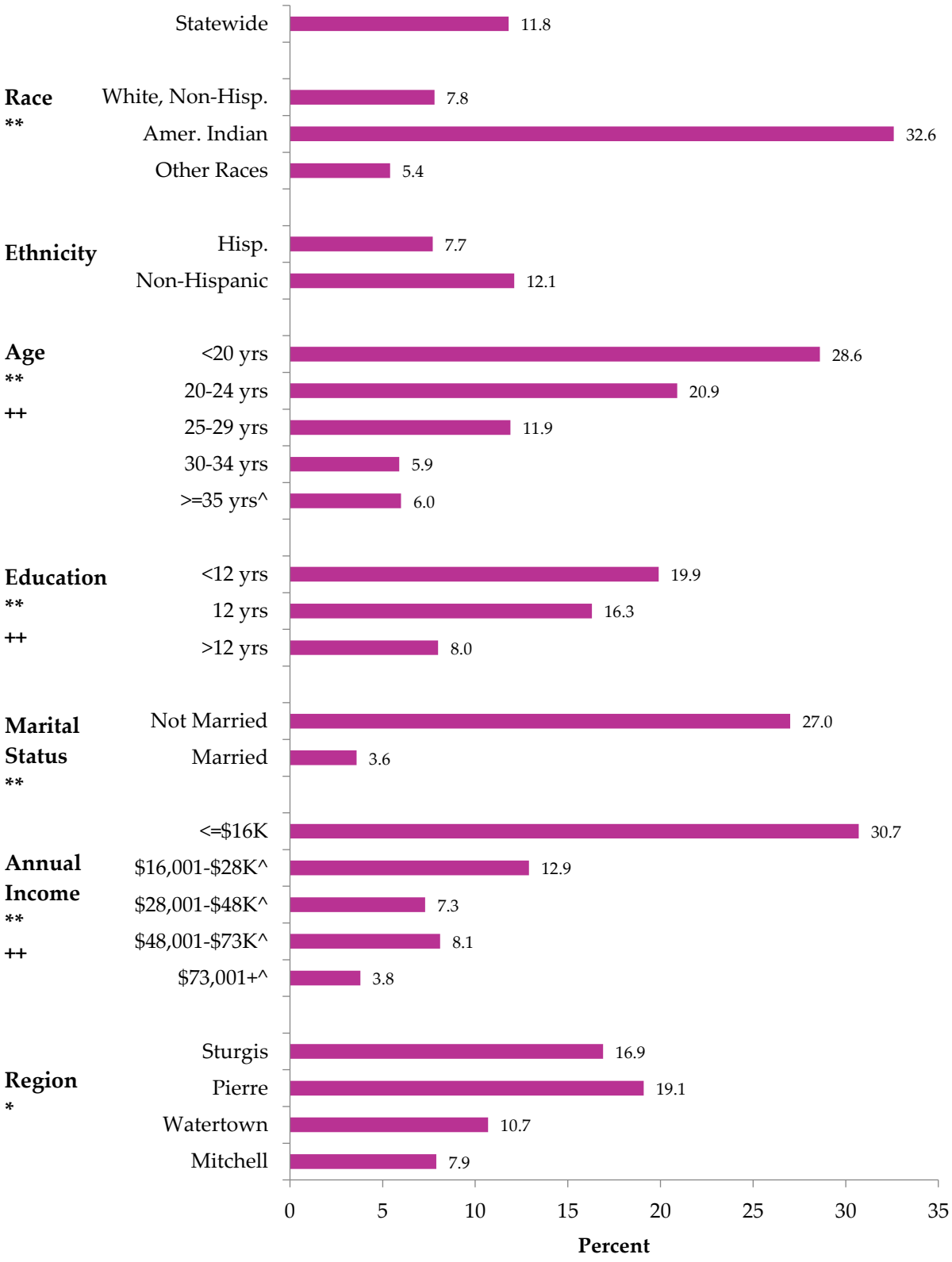
- Overall prevalence of South Dakota mothers who used any illicit drugs before pregnancy was 11.8%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with using illicit drugs before pregnancy included maternal race, age, education, marital status, household income and region of the state that the mother resided.
- Mothers who were American Indian, less than 20 years of age, had fewer years of education, who were not married, had household income less than $16,000 and who resided in the Central region had a higher prevalence of using illicit drugs before pregnancy compared to their counterparts.

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:

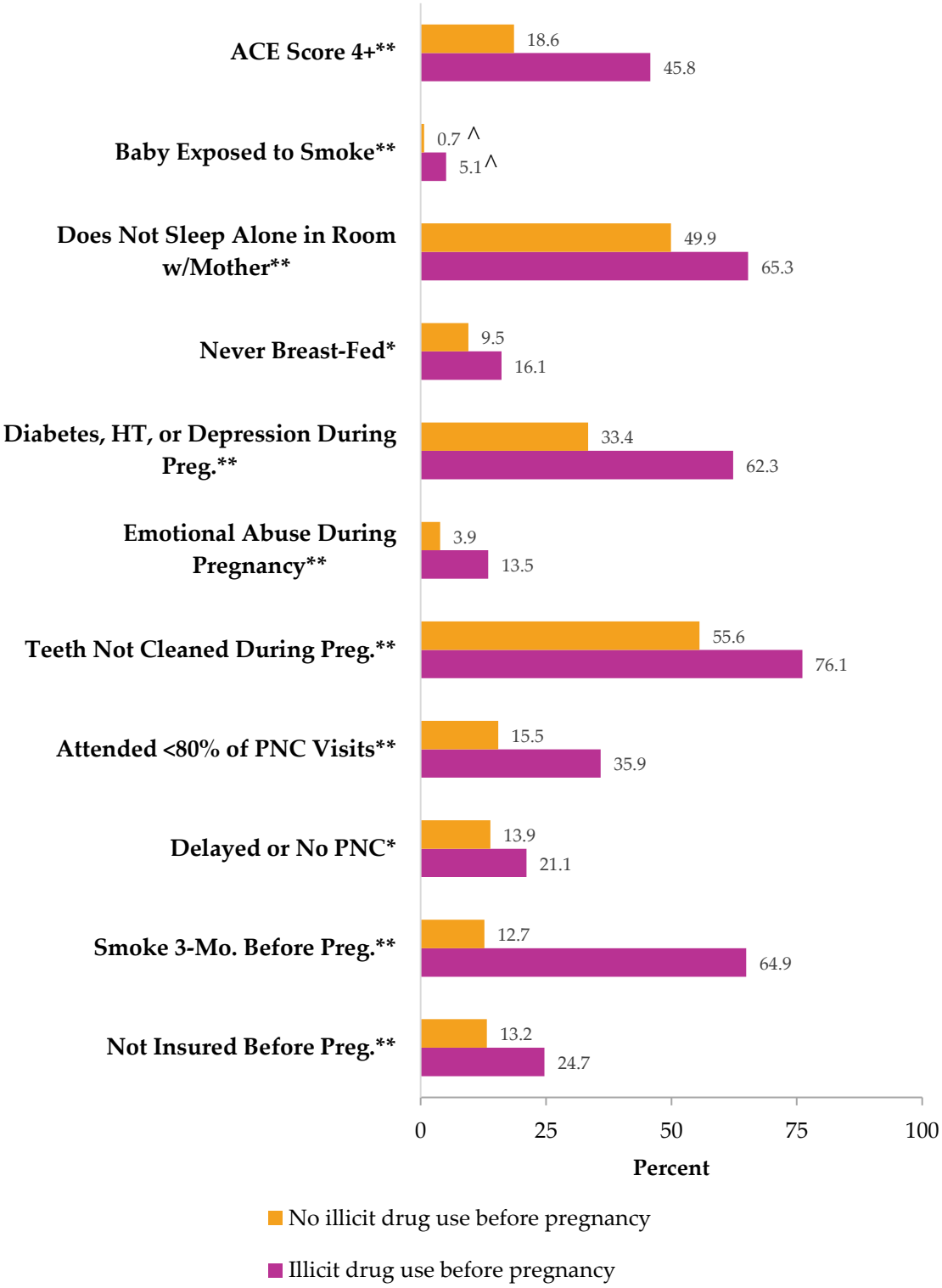
- They were uninsured before pregnancy (24.7% vs. 13.2%).
- They smoked the 3 months before pregnancy (64.9% vs. 12.7%).
- They started prenatal care after the first trimester or had no prenatal care (21.1% vs. 13.9%).
- They attended fewer than 80% of their prenatal visits (35.9% vs. 15.5%).
- They did not have their teeth cleaned during pregnancy (76.1% vs. 55.6%).
- They suffered emotional abuse during pregnancy (13.5% vs. 3.9%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (62.3% vs. 33.4%).
- They never breastfed their infant (16.1% vs. 9.5%).
- Their infant does not sleep alone in the mother's room (65.3% vs. 9.5%).
- Their baby is exposed to smoke (5.1^% vs. 0.7^%; interpret these percentages with caution).
- They had a high ACE score (4+) (45.8% vs. 18.6%).

Figure 15.2: Percentage of mothers who used any illicit drug the month before pregnancy by demographic characteristics, South Dakota, 2020 (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.
^ 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, 2020 (weighted)



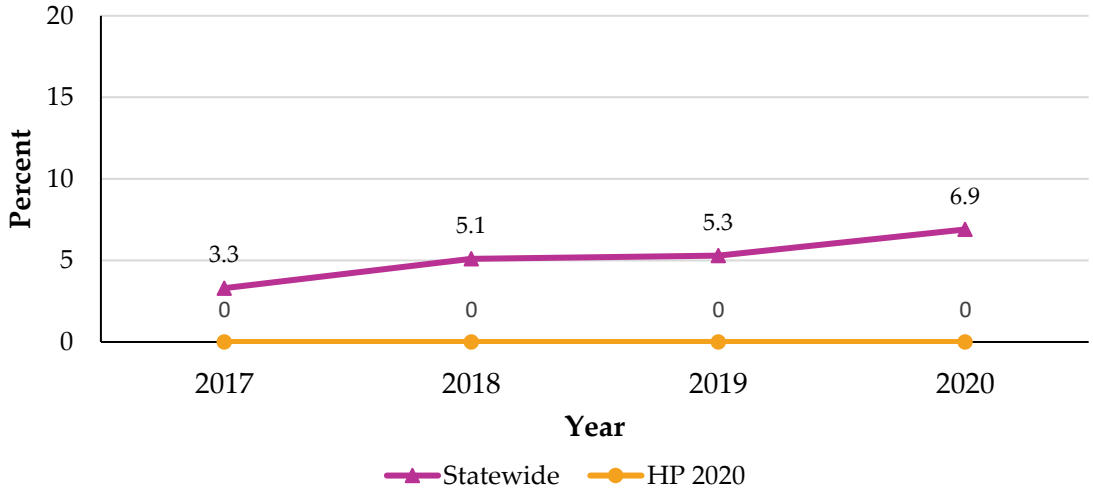
* p-value < 0.05, ** p-value < 0.01 p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care; ACE = adverse childhood experiences, NICU = neonatal intensive care unit

Illicit Drug Use During Pregnancy

Prevalence and Trends (Figure 15.4)

The percentage of South Dakota mothers who used any illicit drugs during pregnancy **has increased over time** (p-value for linear less than 0.05).

Figure 15.4: Mothers who used any illicit drugs during pregnancy by year, South Dakota, 2017–2020 (weighted)



Demographic Characteristics (Figure 15.5)

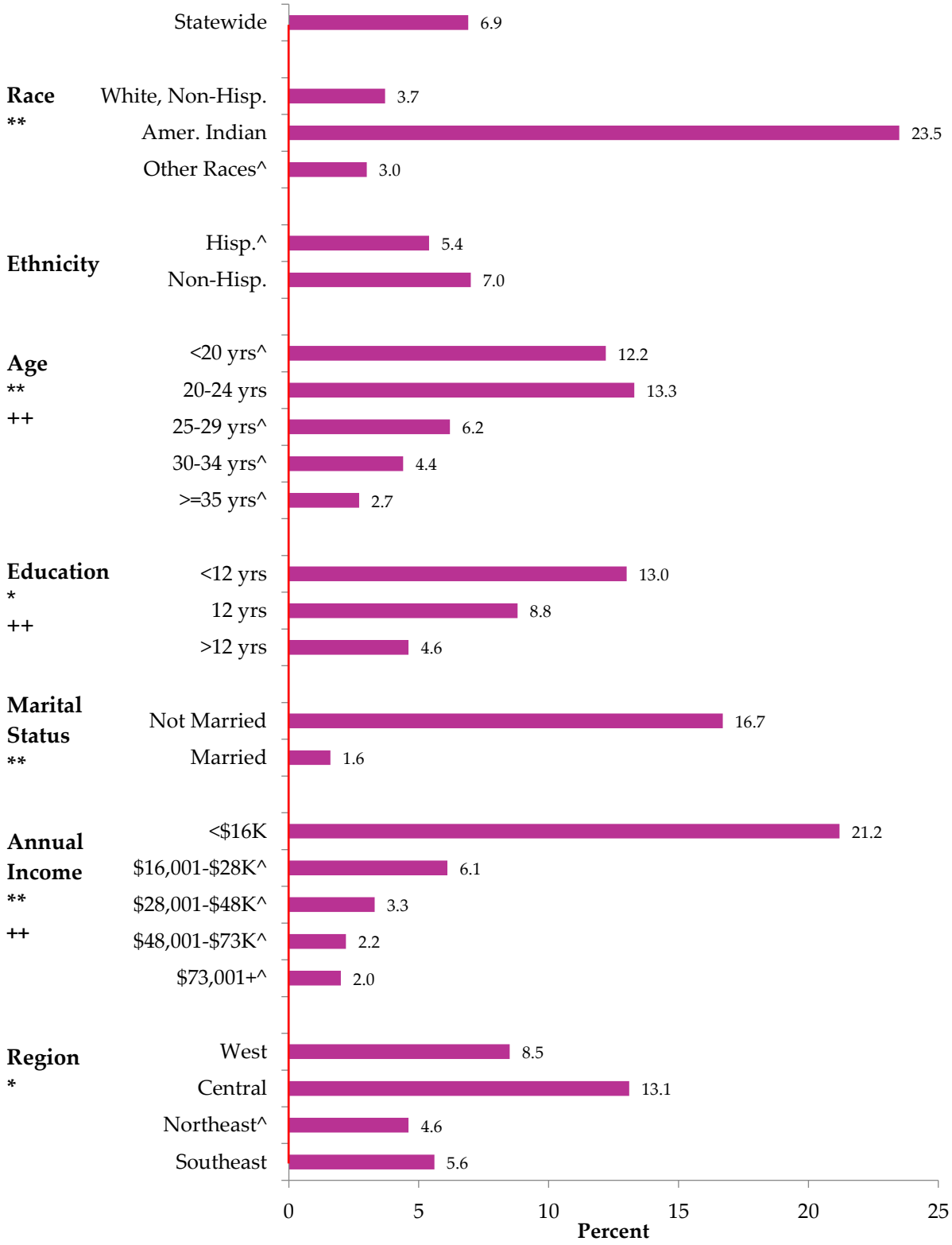
- Overall prevalence of South Dakota mothers who used any illicit drugs during pregnancy was 6.9%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with using illicit drugs during pregnancy included maternal race, age, education, marital status, household income and region of the state that the mother resided.
- Mothers who were American Indian, 20-24 years old, had less than High School education, were not married, had household income less than $16,000 and who resided in the Central region had a higher prevalence of using illicit drugs during pregnancy compared to their counterparts.

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 (26.0% vs. 13.5%).
- They smoked the 3 months before pregnancy (70.9% vs. 14.6%).
- The used illicit drugs the 3 months before pregnancy (97.2% vs. 5.0%).
- They started prenatal care after the first trimester or had no prenatal care (28.8% vs. 13.3%).
- They attended fewer than 80% of their prenatal visits (40.2% vs. 15.9%).
- They did not have their teeth cleaned during pregnancy (75.2% vs. 56.3%).
- They suffered emotional abuse during pregnancy (19.0% vs. 3.9%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (67.4% vs. 34.1%).
- They never breastfed their infant (22.2% vs. 9.1%).
- Their infant was exposed to smoke (8.5^% vs. 0.8^%; interpret these percentages with caution).
- They had a high ACE score (4+) (47.7% vs. 20.0%).

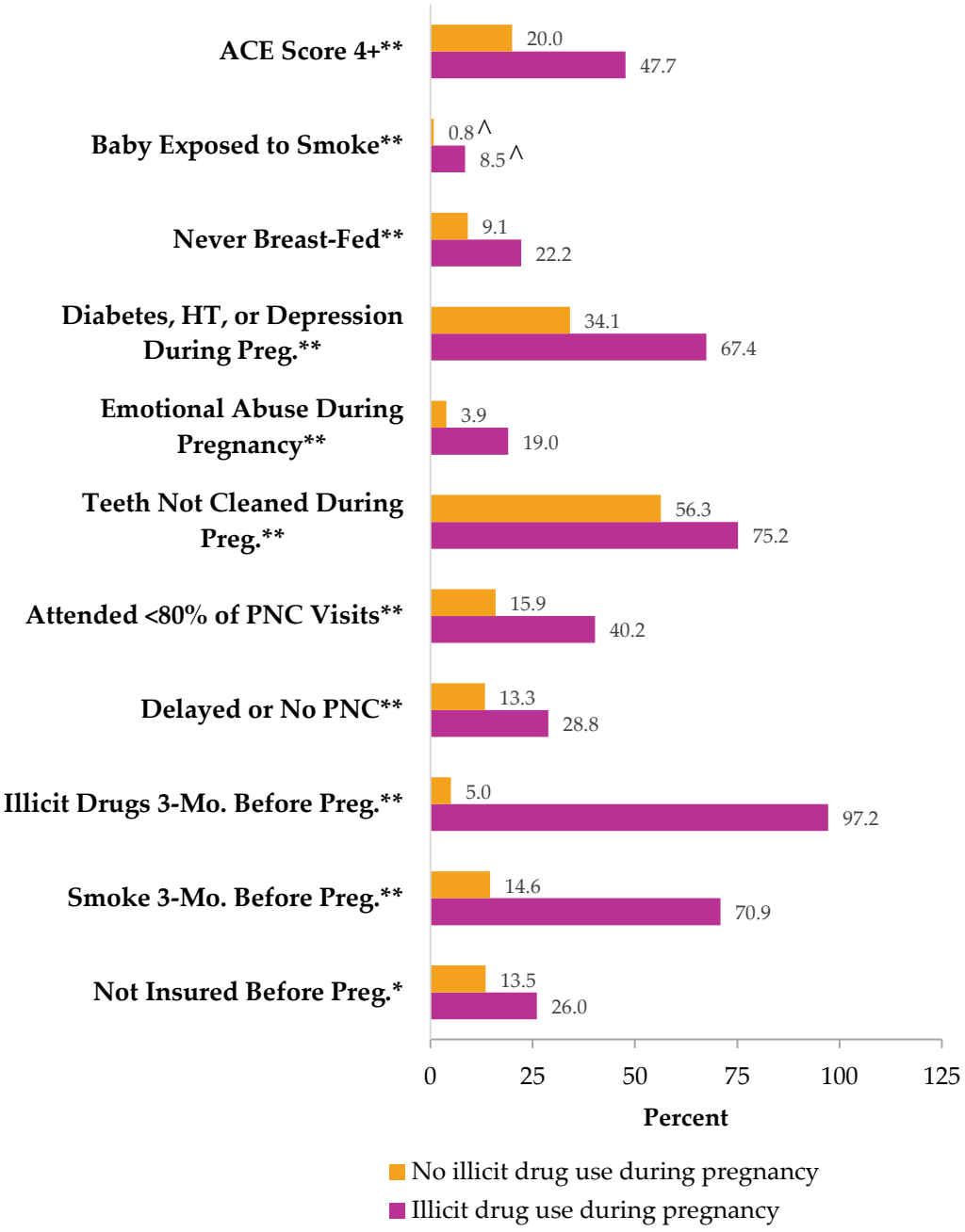
Figure 15.5: Percentage of mothers who used any illicit drug during pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



* 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.
^ 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, 2020 (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

References

1. Patrick SW, Schumacher RE, Benneyworth BD, Drans EE, McAllster JM, David MM. Neonatal abstinence syndrome and associated health care expenditures: United States, 2000-2009. *Journal of the American Medical Association* 307:1934-1940, 2012.
2. Behnke M, Smith VC. Prenatal substance abuse: short- and long-term effects on the exposed fetus. *Pediatrics* 131(3):e1009-1024, 2013.
3. Servey J, Chang J. Over-the-counter medications in pregnancy. American Family Physician 90(8):548-555, 2014.

Chapter 16: Breastfeeding

Measure	% of women (95% CI, N)	
Women's breastfeeding practices with this infant *		
Ever breastfed or pumped breastmilk	89.9	(87.9-91.9, 9192)
Breastfed or pumped breastmilk at least 2 months	74.4	(71.3-77.5, 7513)
Sources of information about breastfeeding		
Mother's doctor	78.8	(75.9-81.8, 7967)
A nurse, midwife, or doula	72.8	(69.5-76.1, 7264)
Baby's doctor or health care provider	69.4	(66.0-72.8, 6876)
Family or friends	63.5	(60.0-67.1, 6324)
A breastfeeding or lactation specialist	62.2	(58.6-65.7, 6151)
A breastfeeding support group	22.1	(19.1-25.2, 2157)
A breastfeeding hotline or toll-free number	11.4	(9.1-13.7, 1106)
***Among women who breastfed even for a short time but currently are not breast-feeding*, reasons for stopping ***		
Thought she was not producing enough milk, or milk dried up	54.7	(47.9-61.5, 1456)
Baby had difficulty latching or nursing	34.7	(28.2-41.3, 925)
Breast milk alone did not satisfy baby	34.5	(28.1-41.0, 919)
Had too many other household duties	25.2	(19.0-31.4, 670)
Nipples were sore, cracked, or bleeding or it was too painful	23.0	(17.1-28.8, 612)
Went back to work	18.6	(13.2-23.9, 495)
Thought baby was not gaining enough weight	14.0	(9.2-18.7, 373)
Felt it was the right time to stop breastfeeding	7.4	(3.8-11.0, 198)
Baby was jaundiced (yellowing of the skin or whites of the eyes)	6.9	(4.0-9.7, 183)
Got sick or had to stop for medical reasons	5.8	(2.7-9.0, 155)
Went back to school	2.0	(0.8-3.2, 54)^
Partner did not support breastfeeding	1.3	(0.3-2.2, 34)^

* 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). CDC recommendations 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

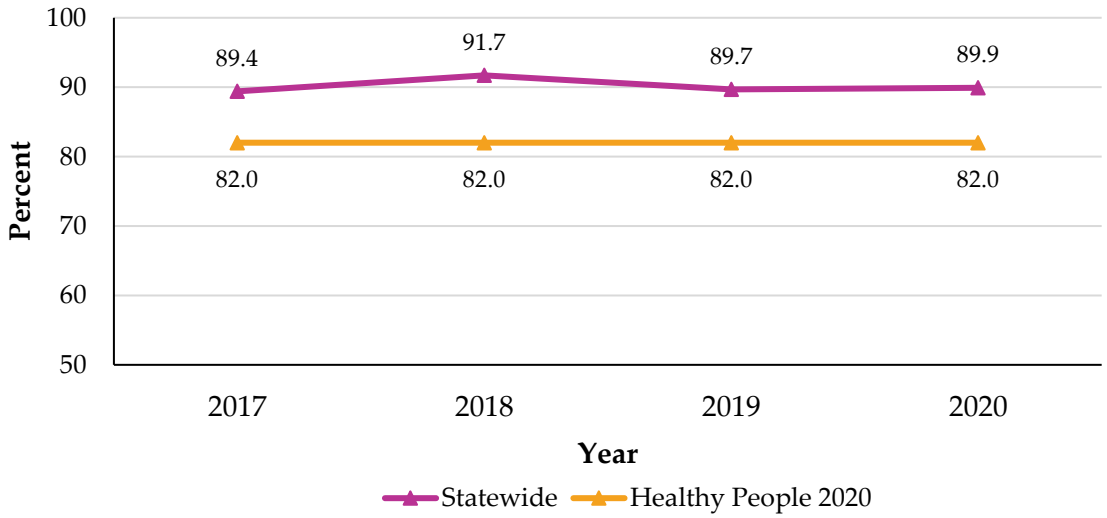
- **MICH-21.1** Increase the proportion of infants who are ever breastfed to 82%.

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 over time (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, 2017-2020 (weighted)



Demographic Characteristics (Figure 16.2)

- Overall prevalence of South Dakota mothers who ever breastfed was 89.9%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with ever breastfeeding included maternal race, age, education, marital status, and household income.
- Mothers who were white and other races, 30-34 years of age, had greater than High School 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)

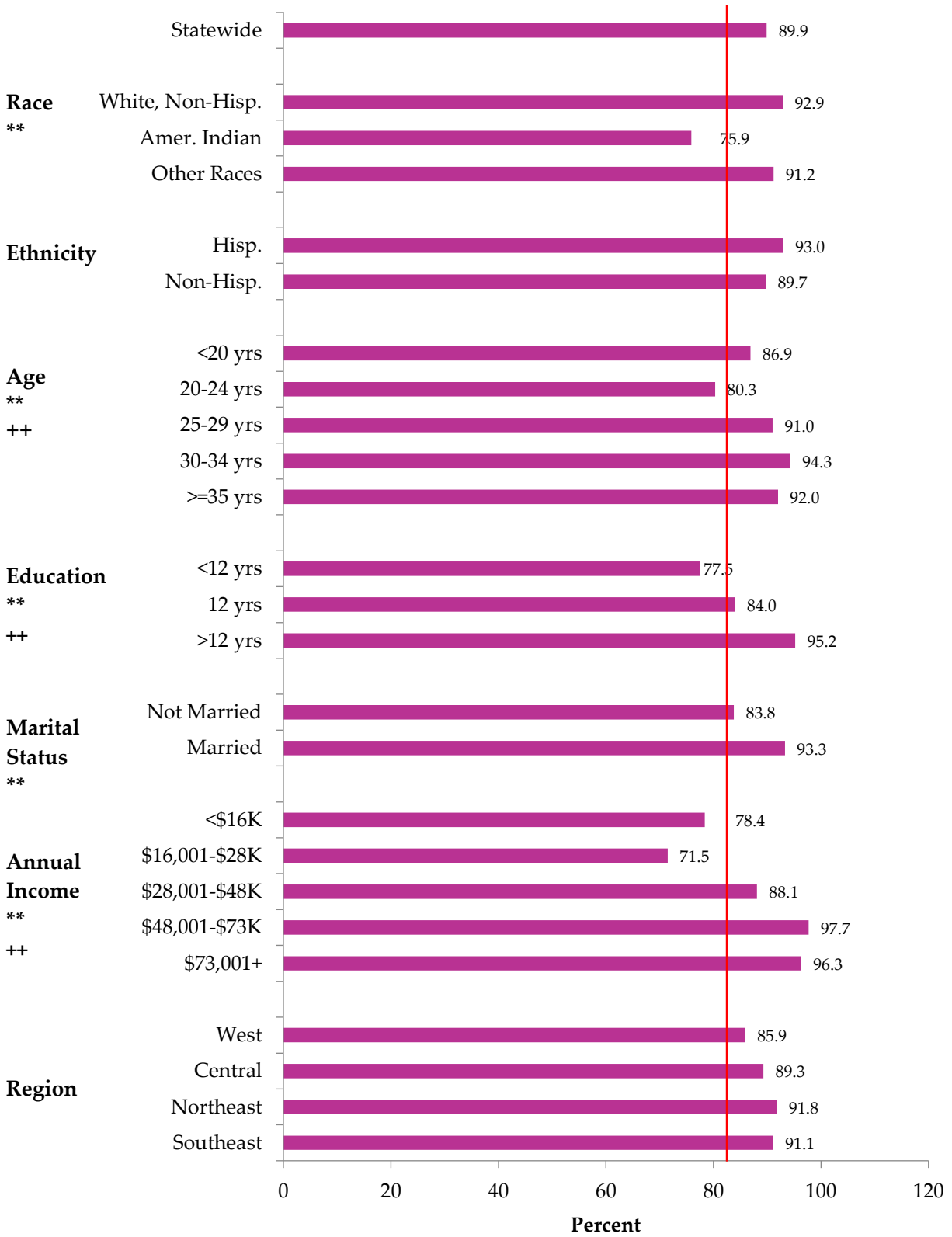
Mothers who ever breastfed, compared to mothers who did not ever breastfeed, were significantly (p-value less than 0.05) *more likely* to report that:

- They drank alcohol the 3 months before pregnancy (67.5% vs. 47.6%).
- Their infant does not sleep alone in room with mother (53.5% vs. 38.5%).

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 (13.3% vs. 25.3%).
- They smoked the 3 months before pregnancy (16.5% vs. 35.9%).
- The used illicit drugs the month before pregnancy (10.7% vs. 17.9%).
- They had obesity prior to pregnancy (27.2% vs. 37.9%).
- They started prenatal care after the first trimester or had no prenatal care (13.4% vs. 25.0%).
- They attended fewer than 80% of their prenatal visits (16.5% vs. 27.7%).
- They did not have their teeth cleaned during pregnancy (55.6% vs. 78.5%).
- They suffered emotional abused during pregnancy (4.2% vs. 9.7^%).
- They had a high ACE score (4+) (20.9% vs. 35.8%).

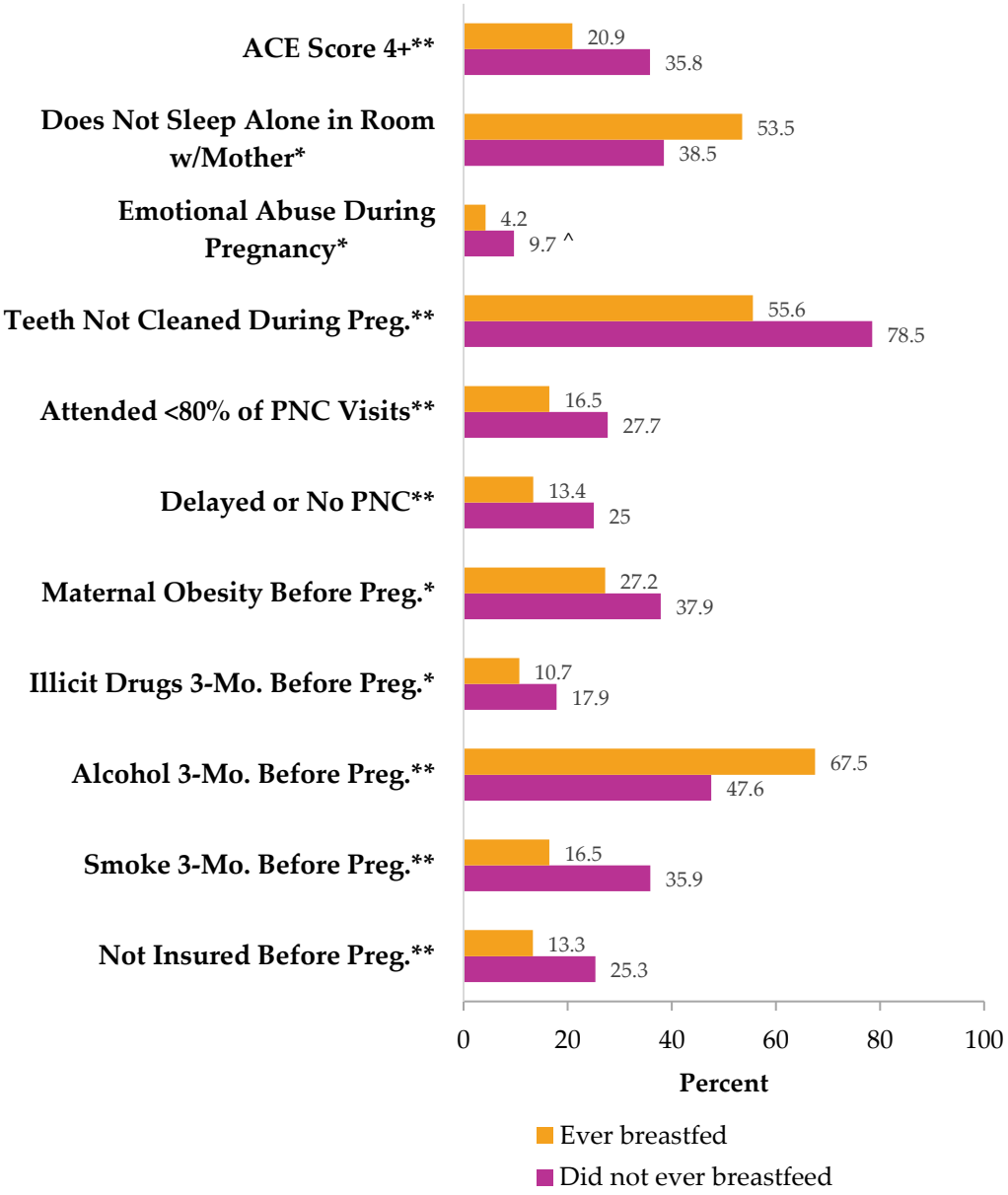
Figure 16.2: Percentage of mothers who ever breastfed or pumped breastmilk by demographic characteristics, South Dakota, 2020 (weighted)



* 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.

— Healthy People 2020 (82%)

Figure 16.3: Risk behaviors and outcomes by mothers who ever breastfed or pumped breastmilk, South Dakota, 2020 (weighted)



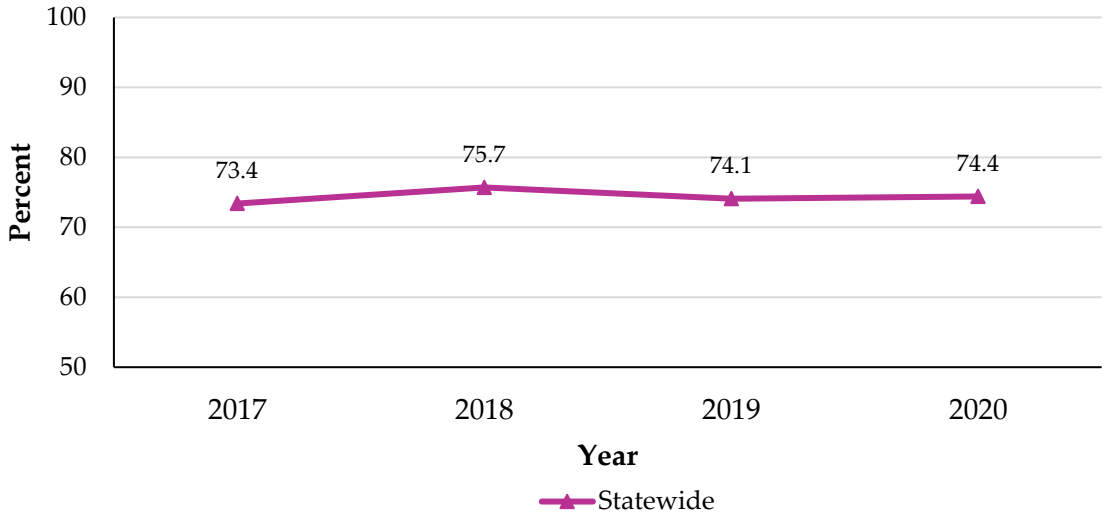
* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care

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 over time (p-value for linear trend greater than 0.05).

Figure 16.4: Mothers who breastfed at least two months by year, South Dakota, 2017-2020 (weighted)



Demographic Characteristics (Figure 16.5)

- Overall prevalence of South Dakota mothers who breastfed at least two months was 74.4%.
- Characteristics significantly (p-value less than 0.05) associated with breastfeeding for at least two months included maternal race, age, education, marital status, and household income.
- Mothers who were white, older, had greater than High School education, were married, and who had greater household income had a higher prevalence of breastfeeding at least two months postpartum compared with their counterparts.

Risk Behaviors and Outcomes (Figure 16.6)

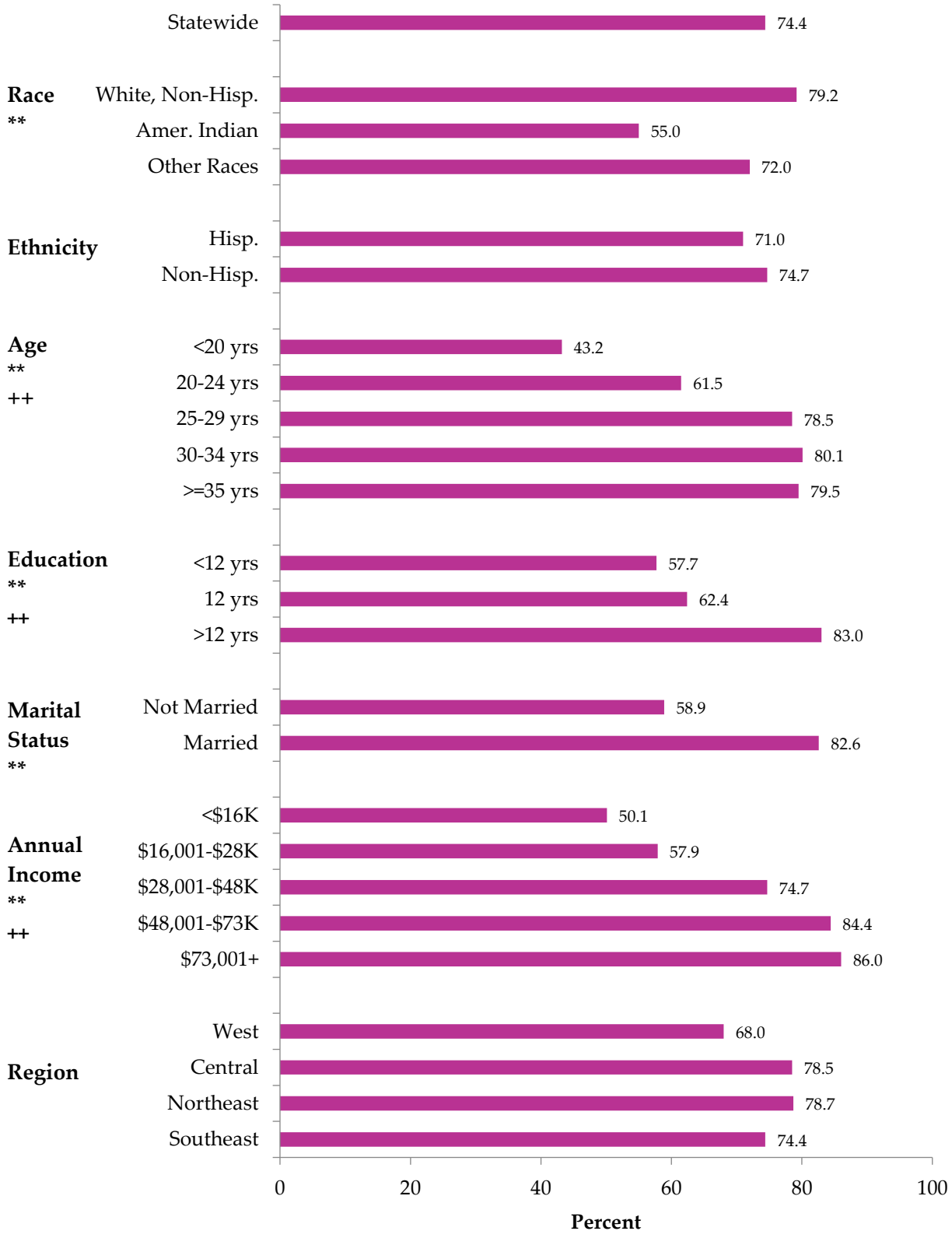
Mothers who breastfed at 2 months, compared to mothers who did not breastfeed at least two months, were significantly (p-value less than 0.05) *more likely* to report that:

- They drank alcohol 3 months before pregnancy (69.6% vs. 54.0).
- Their infant does not sleep alone in the mother's room (55.6% vs. 41.9%).

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:

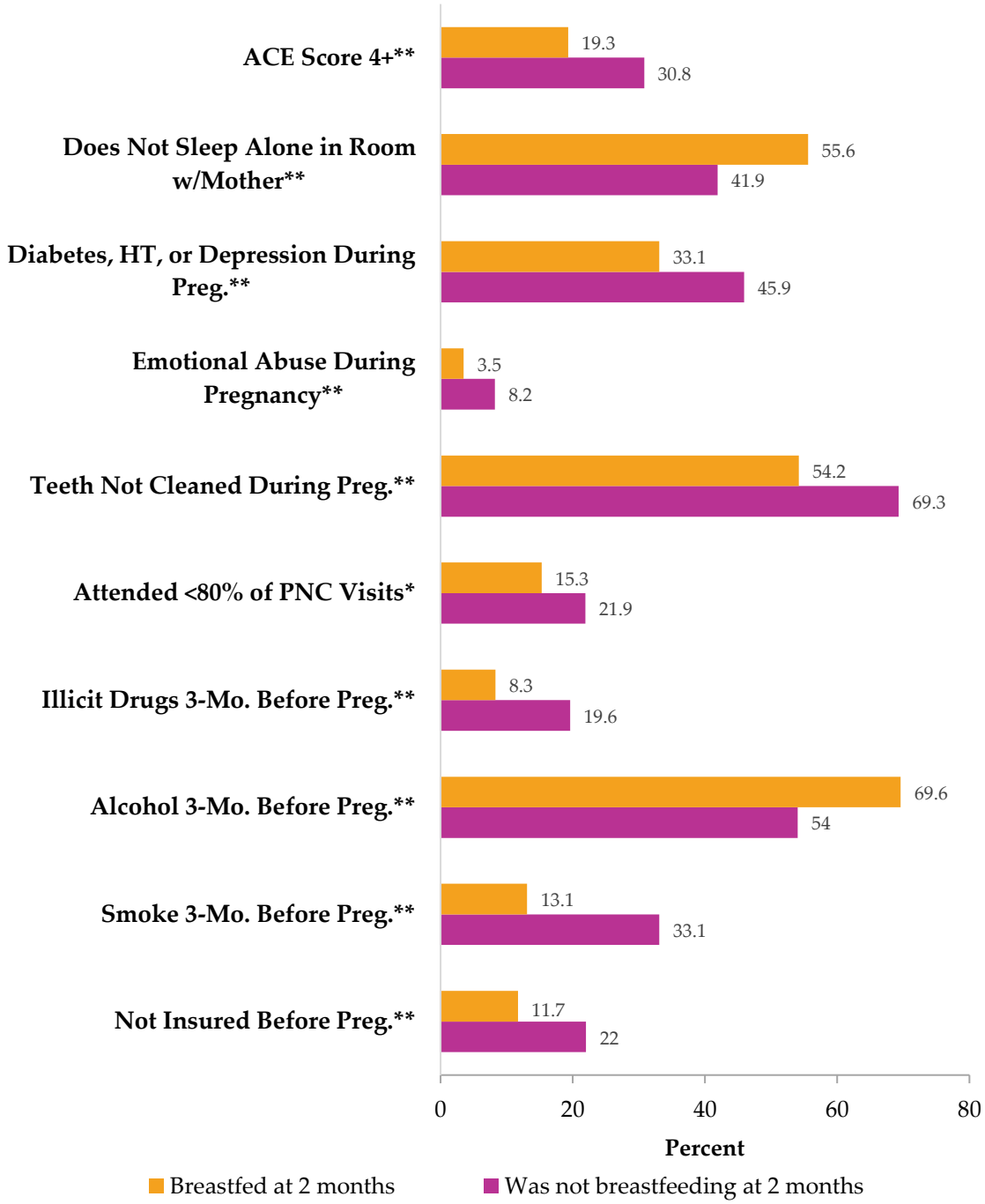
- They were not insured before pregnancy (11.7% vs. 22.0%).
- They smoked the 3 months before pregnancy (13.1% vs. 33.1%).
- They used illicit drugs the 3 months before pregnancy (8.3% vs. 19.6%).
- They attended fewer than 80% of their prenatal visits (15.3% vs. 21.9%).
- They did not have their teeth cleaned during pregnancy (54.2% vs. 69.3%).
- They suffered emotional abuse during pregnancy (3.5% vs. 8.2%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (33.1% vs. 45.9%).
- They had a high ACE score (4+) (19.3% vs. 30.8%).

Figure 16.5: Percentage of mothers who breastfed or pumped breastmilk at least two months by demographic characteristics, South Dakota, 2020 (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.

Figure 16.6: Risk behaviors and outcomes by mothers who breastfed at least two months, South Dakota, 2020 (weighted)



* p-value < 0.05, ** p-value < 0.01 p-value based on Rao-Scott chi-square test.
PNC = prenatal care

References

1. Eidelman AI, Schanler, R.J. Breastfeeding and the use of human milk: Executive summary of the American Academy of Pediatrics. *Pediatrics* 129:600-603, 2012.

2. Ip S, Chung M, Raman G, Trikalinos TA, Lau J. A summary of the Agency for Healthcare Research and Quality's Evidence Report on breastfeeding in developed countries. *Breastfeeding Medicine : Official Journal of the Academy of Breastfeeding Medicine* 4 Suppl 1:S17-30, 2009.

3. Leung A, Sauve R. Breast is best for babies. *Journal of the National Medical Association* 97:1010-1019, 2005.

Chapter 17: Infant health

Measure	% of women (95% CI, N)
Length of infant hospital stay, all infants	
Less than 1 day	5.4 (1.3-3.3, 247)
1-2 days	66.1 (62.7-69.5, 6844)
3-5 days	20.0 (17.3-22.8, 2076)
6-14 days	3.7 (2.4-5.1, 387)
More than 14 days	3.5 (2.2-4.9, 366)
Not born in hospital	1.0 (0.2-1.8, 105)^
Still in hospital	0.1 (0.0-0.3, 14)^
Infant health after delivery	
Among mothers of all infants	
Infants who were born preterm (less than 37 weeks)	9.0 (7.0-11.0, 938)
Infants who were low birth weight (less than 2500 grams)	6.4 (4.6-8.1, 660)
Among mothers with singletons only	
Infants who were born preterm (less than 37 weeks)	8.3 (6.4-10.3, 853)
Infants who were low birth weight (less than 2500 grams)	5.8 (4.1-7.5, 598)
Singleton infants with gestational age	
Less than 28 weeks (extremely preterm)	0.4 (0.0-0.9, 44)^
28-33 weeks (moderately preterm)	1.5 (0.6-2.4, 153)
34-36 week (late preterm)	6.4 (4.7-8.1, 657)
37-44 weeks (term or post-term)	91.7 (89.7-93.6, 9382)
Singleton infants with birth weight (g)	
250-1449 (very low birth weight, VLBW)	0.8 (0.2-1.4, 78)^
1500-2499 (low birth weight, LBW)	5.1 (3.5-6.7, 519)
2500-4000 (normal birth weight)	85.2 (82.6-87.7, 8723)
Over 4000 (high birth weight)	9.0 (7.0-11.0, 923)

^ 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

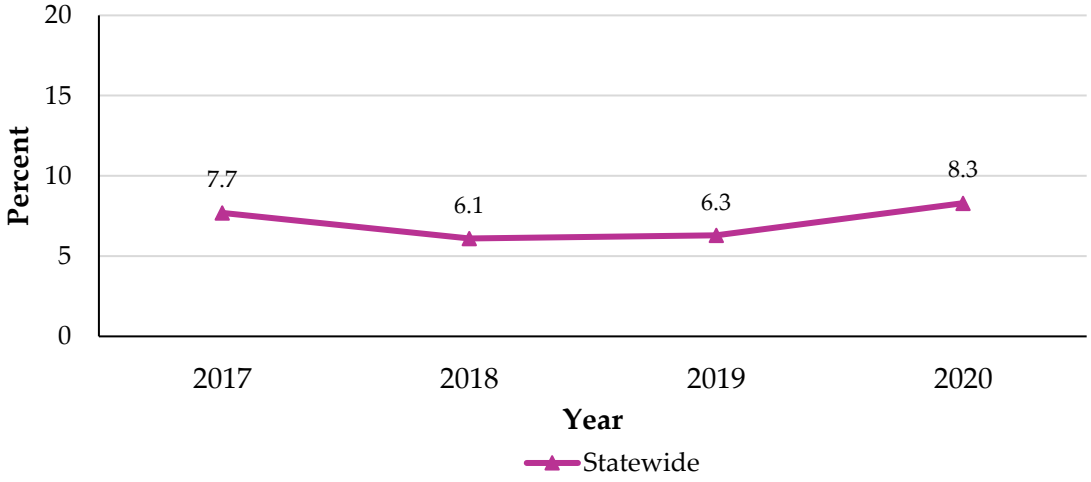
A *singleton* is an offspring (baby) born singly, as distinguished from twins.

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 over time (p-value for linear trend greater than 0.05).

Figure 17.1: Mothers who had a singleton preterm birth by year, South Dakota, 2017–2020 (weighted)



Demographic Characteristics (Figure 17.2)

- Overall prevalence of South Dakota mothers who had a singleton preterm birth was 8.3%.
- There were no demographic characteristics significantly associated with having a singleton preterm birth.

Risk Behaviors and Outcomes (Figure 17.3)

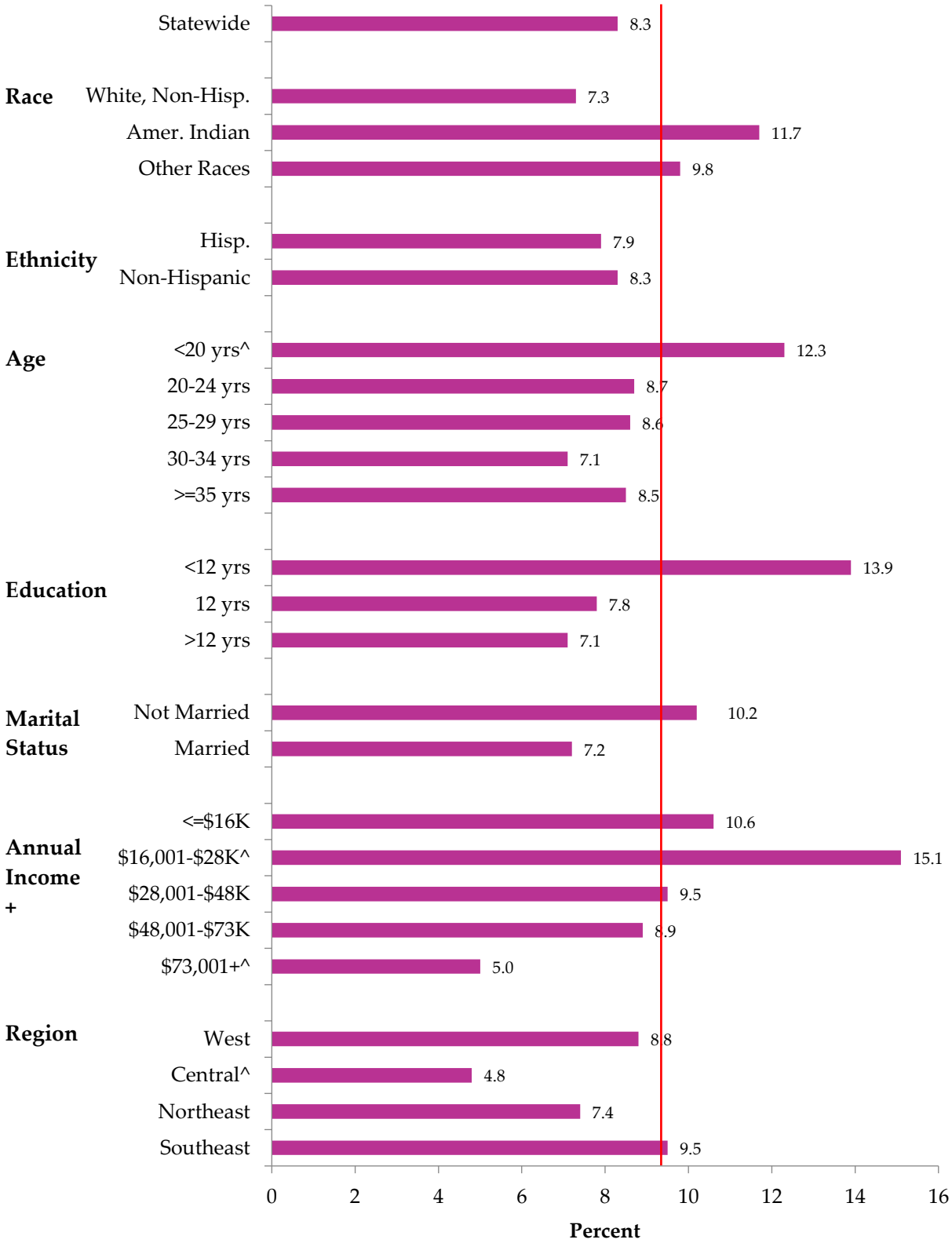
Mothers who had a singleton preterm birth, compared to mothers who did not have a preterm birth, were significantly (p-value less than 0.05) *more likely* to report that:

- They did not have their teeth cleaned during pregnancy (75.5% vs. 56.8%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (53.3% vs. 34.8%).
- They had a cesarean section delivery (37.4% vs. 21.9%).
- Their infant was low birth weight (<2500 grams) (45.2% vs. 2.3%).
- Their infant was admitted to the NICU (51.5% vs. 4.9%).

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) l*ess likely* to report that:

- They were uninsured before pregnancy (4.5^%% vs. 15.1%; interpret percentages with caution).

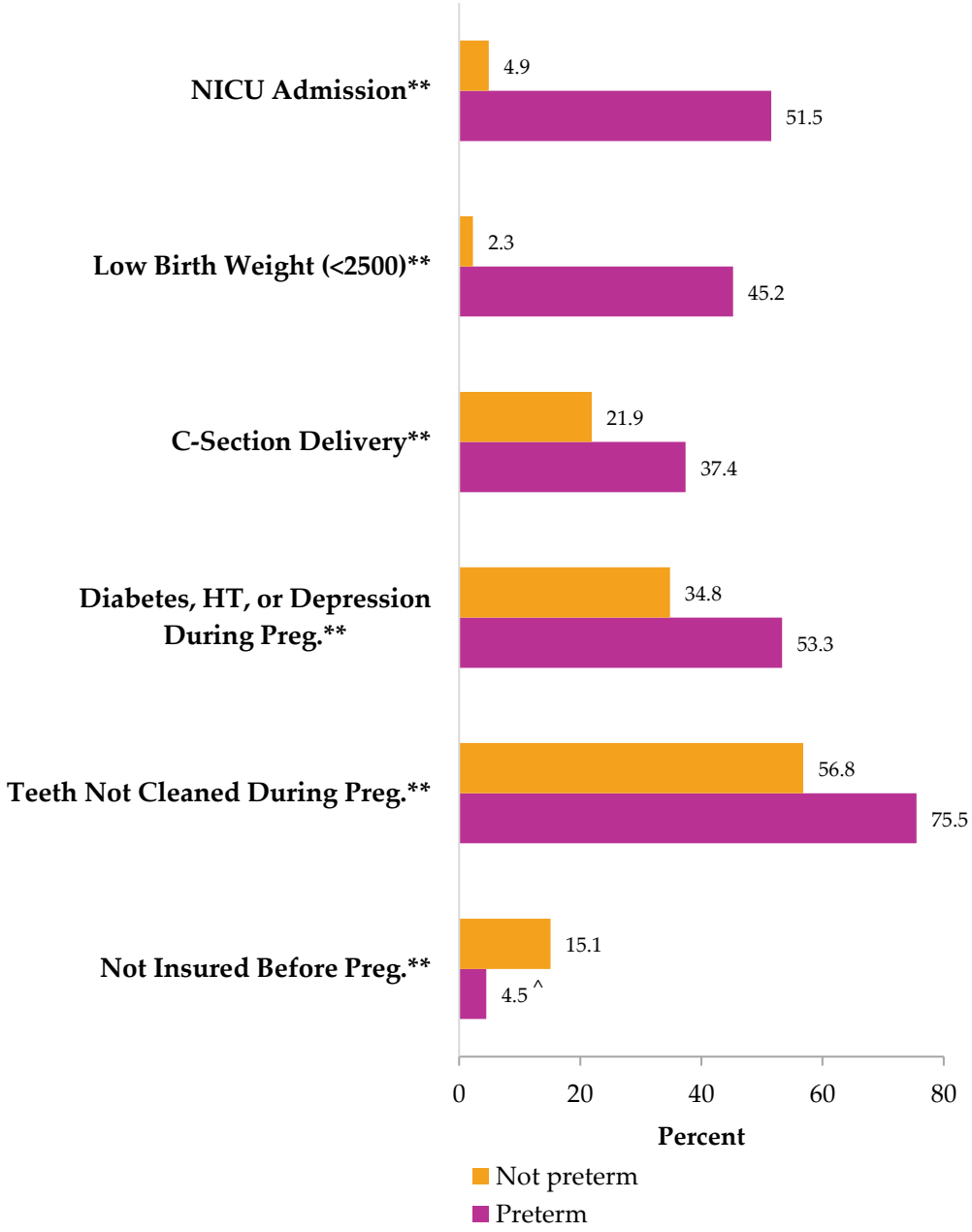
Figure 17.2: Percentage of mothers with a singleton infant who was born premature by demographic characteristics, South Dakota, 2020 (weighted)



* 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).
^ 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, 2020 (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).
NICU = neonatal intensive care unit, ACE = adverse childhood experiences

References

1. Blencowe, H, Cousens, S, Oestergaard, MZ. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. Lancet. 2012;379 (9832):2162–2172

2. Damus, K. Prevention of preterm birth: A renewed national priority. Current Opinions in Obstetrics and Gynecology 20: 590-596, 2008.

Chapter 18: Infant safe sleep

Measure	% of women (95% CI, N)	
Infant sleep practices		
Infant most often laid to sleep on back	87.8	(85.4-90.1, 8964)
Infant sleeps alone in his or her own crib or bed		
Always	60.3	56.8-63.8, 6156)
Often/almost always	18.4	(15.6-21.3, 1883)
When infant sleeps alone, the crib or bed is in the same room as the mother	83.4	(80.5-86.4, 7746)
How infant usually slept in the past 2 weeks		
In a crib, bassinet, or pack and play	90.1	(88.1-92.1, 9114)
On a twin or larger mattress or bed	22.7	(19.8-25.6, 2248)
On a couch, sofa, or armchair	8.7	(6.7-10.7, 862)
In an infant car seat or swing	44.9	(41.2-48.6, 4427)
In a sleeping sack or wearable blanket	47.7	(44.1-51.4, 4707)
With a blanket	40.6	(36.9-44.2, 3992)
With toys, cushions, or pillows, including nursing pillows	6.0	(4.3-7.7, 589)
With crib bumper pads (mesh or non-mesh)	10.3	(8.1-12.4, 1010)
Infants were placed to sleep		
On approved sleep surface (HRSA Definition)	40.1	(36.5-43.7, 3932)
Without soft objects or loose bedding	55.8	(52.2-59.5, 5404)
Room-sharing without bed-sharing	48.0	(44.4-51.7, 4849)
Infant sleep recommendations discussed by health care worker		
Place infant on back to sleep	94.7	(93.1-96.3, 9621)
Place infant to sleep in a crib, bassinet, or pack and play	91.8	(89.8-93.7, 9254)
Place infant's crib or bed in mother's room	63.0	(59.5-66.6, 6348)
What things should and should not go in the infant's bed	89.7	(87.5-91.9, 9031)

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

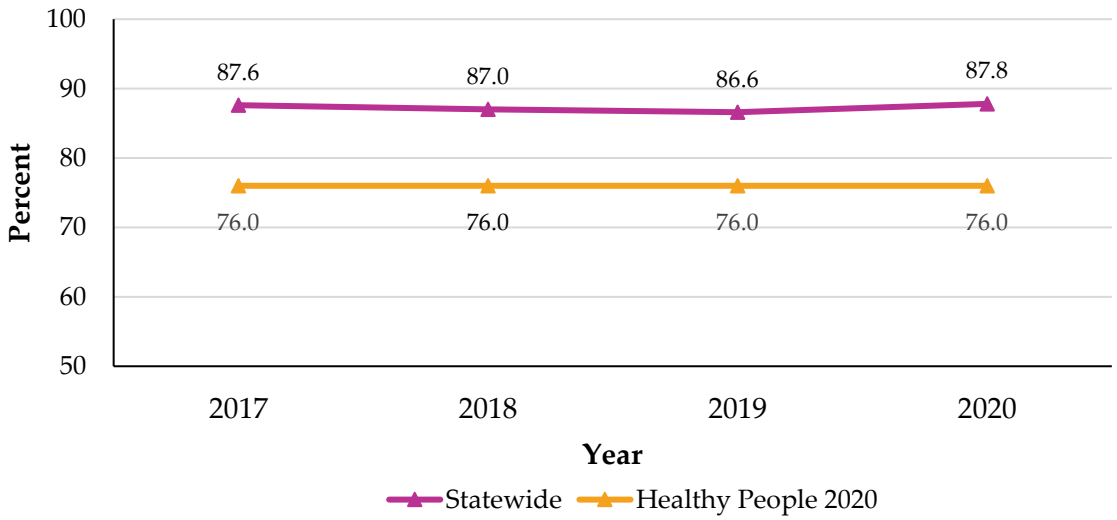
- *Sudden unexpected infant death (SUID)* is a term used to describe any sudden and unexpected death, whether explained or unexplained, and includes sudden infant death syndrome (SIDS) and sleep-related infant deaths.
- *Approved sleep surface* is a composite of how the infant usually slept in the past 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 over time (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, 2017-2020 (weighted)



Demographic Characteristics (Figure 18.2)

- Overall prevalence of South Dakota mothers who placed their infant on his or her back to sleep was 87.8%.
- The demographic characteristic significantly (p-value less than 0.05) associated with mothers placing their infant on his or her back to sleep was maternal education, household income and region of the state that the mother resided.
- Mothers who had more years of education and who had a household income of greater than $73,000 had higher prevalence of placing their infant on his or her back to sleep compared with their counterparts. Mothers in the Western and Southeastern regions had the highest prevalence of placing their infant on his or her back to sleep.

Risk Behaviors and Outcomes (Figure 18.3)

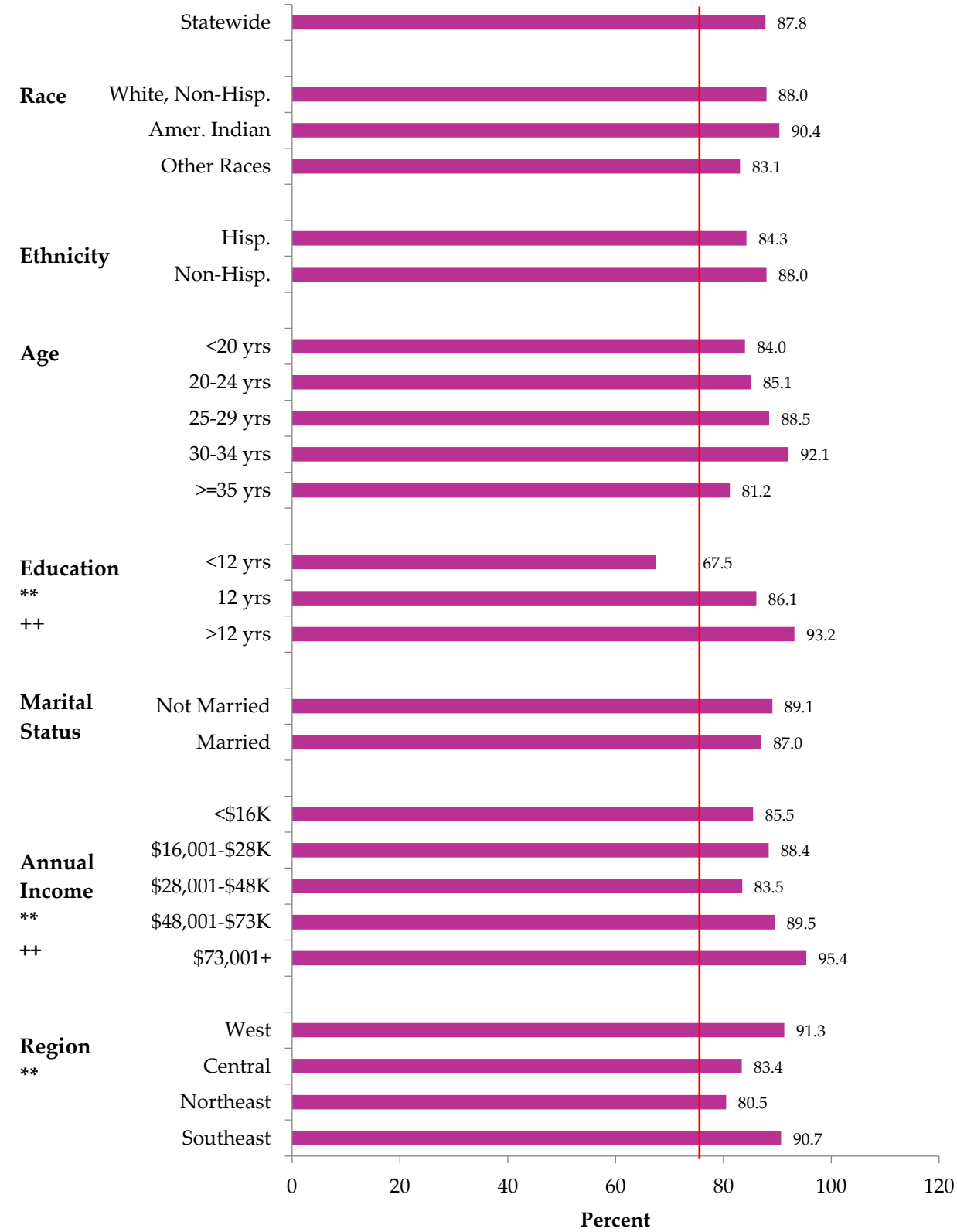
Mothers who placed their infant on his or her back to sleep, compared to mothers who *did not* place their infant on his or her back to sleep, were significantly (p-value less than 0.05) *more likely* to report that:

- Their infant was born high birthweight (4000g) (9.7% vs. 4.0^%; interpret these percentages with caution).

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 (11.3% vs. 37.5%).
- They attended fewer than 80% of their prenatal visits (15.9% vs. 29.4%).
- They did not have their teeth cleaned during pregnancy (56.3% vs. 69.8%)
- They suffered emotional abuse during pregnancy (3.9% vs. 10.8^%; interpret these percentages with caution.)

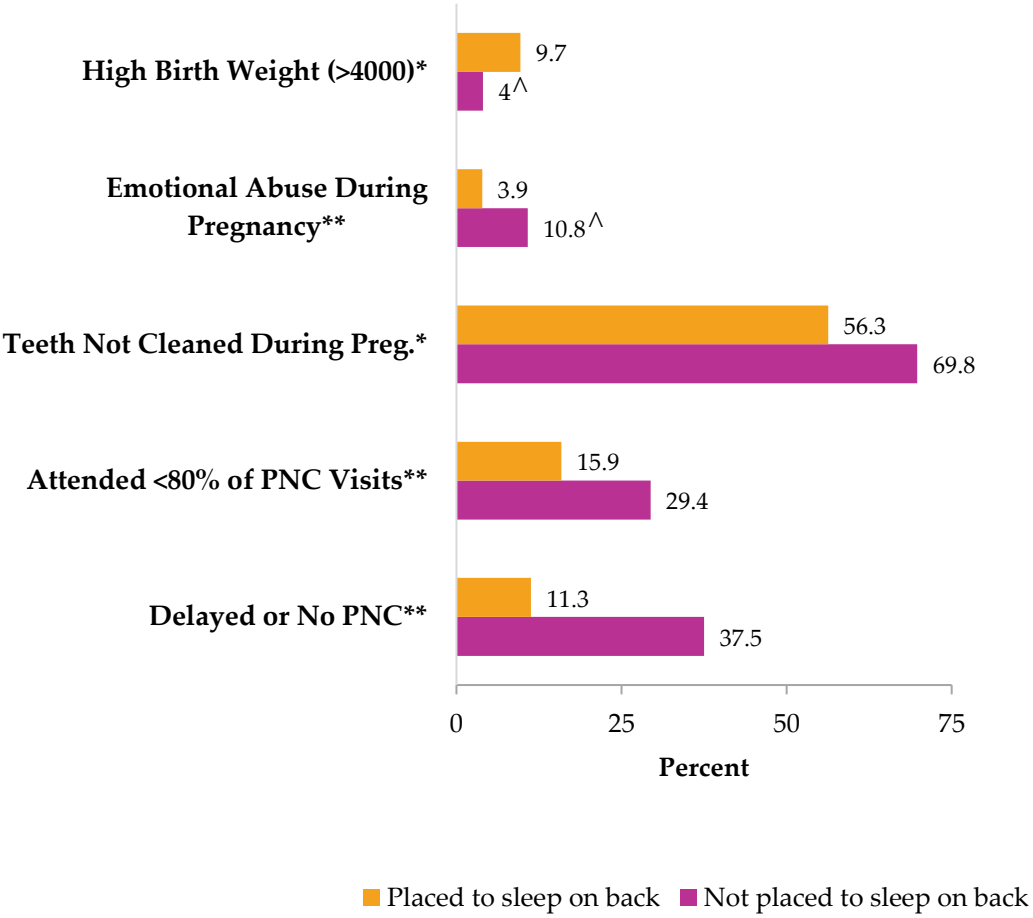
Figure 18.2: Percentage of mothers who most often laid their infant to sleep on their back by demographic characteristics, South Dakota, 2020 (weighted)



** 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 (76%)

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



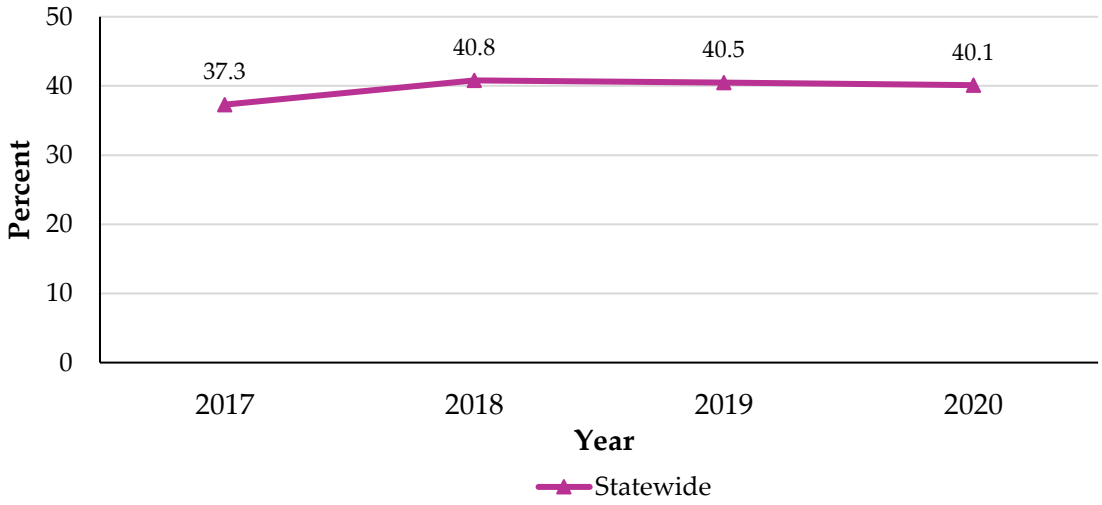
* p-value < 0.05, p-value based on Rao-Scott chi-square test.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).
PNC = prenatal care

Infant sleeps on an approved surface (HRSA definition)

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 over time (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, 2017-2020 (weighted)



Demographic Characteristics (Figure 18.5)

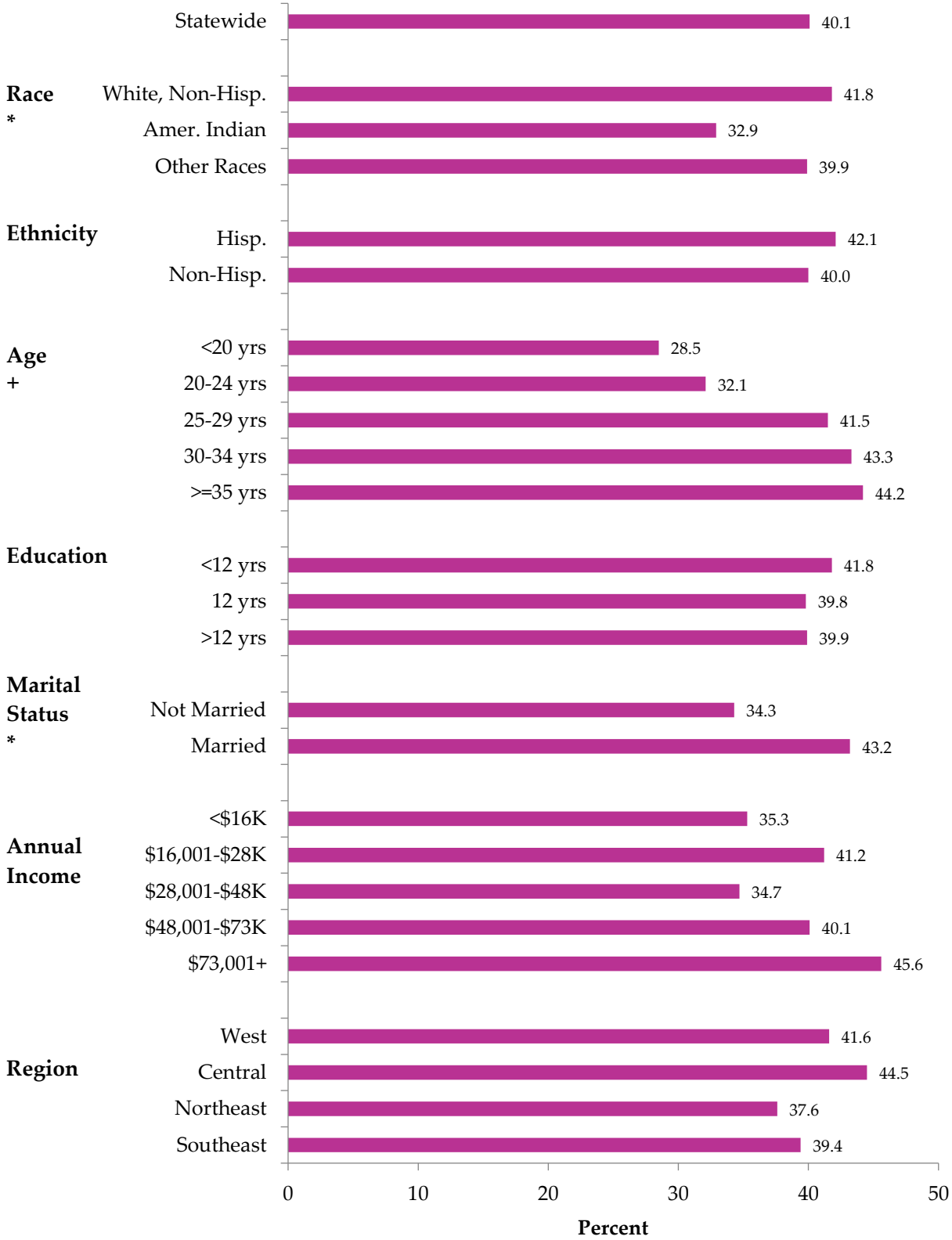
- Overall prevalence of South Dakota mothers who placed their infants on an approved sleep surface was 40.1%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with placing the infant on an approved sleep surface included maternal race and marital status.
- Mothers who were white and married had a higher prevalence of placing their infants on an approved sleep surface compared with counterparts.

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) *less likely* to report that:

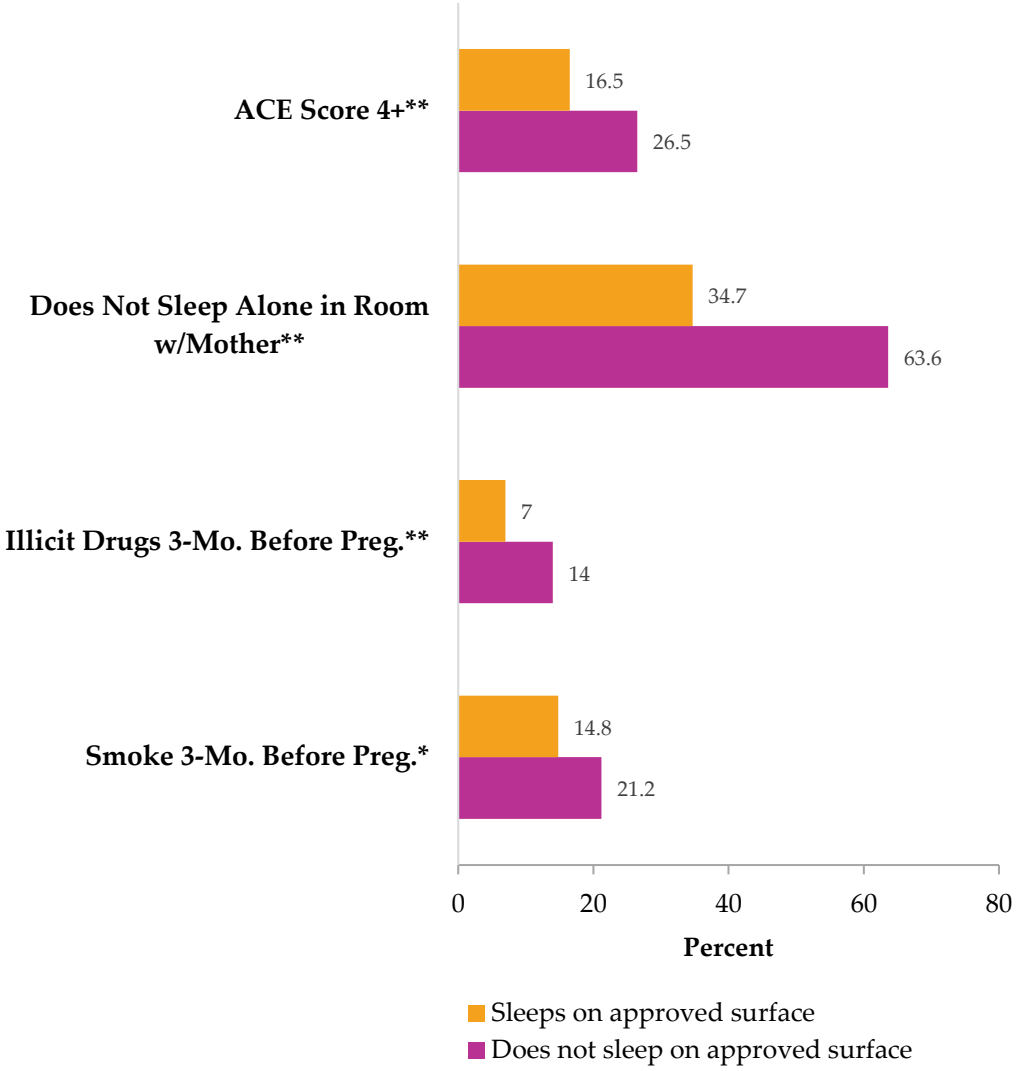
- They smoked the 3 months before pregnancy (14.8% vs. 21.2%).
- They used illicit drugs 3 months before pregnancy (7.0% vs. 14.0%)
- Their infant does not sleep alone in the mother's room (34.7% vs. 63.6%).
- They had a high ACE score (4+) (16.5% vs. 26.5%).

Figure 18.5: Percentage of mothers who most often laid their infant to sleep on an approved sleep surface by demographic characteristics, South Dakota, 2020 (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

Figure 18.6: Risk behaviors and outcomes by mothers who most often laid their infant to sleep on an approved sleep surface, South Dakota, 2020 (weighted)



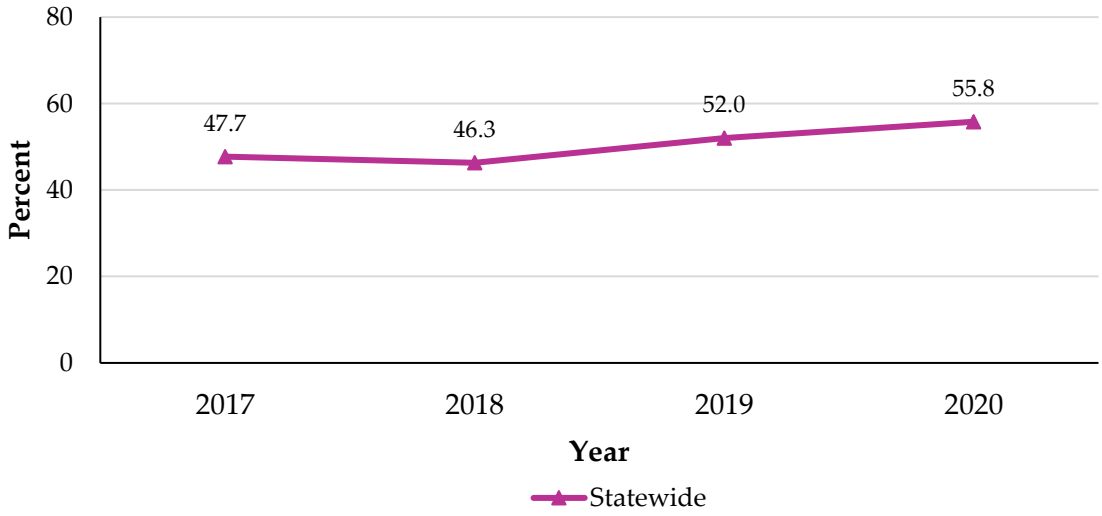
* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
ACE = adverse childhood experiences

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 increased** over time (p-value less 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, 2017-2020 (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 55.8%.
- 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, and household income.
- Mothers who were white, between 30-34 years of age, had more years of education, were married, and who had household income greater than $73,000 had a higher prevalence of laying their infant to sleep *without* soft objects or loose bedding compared with their counterparts.

Risk Behaviors and Outcomes (Figure 18.9)

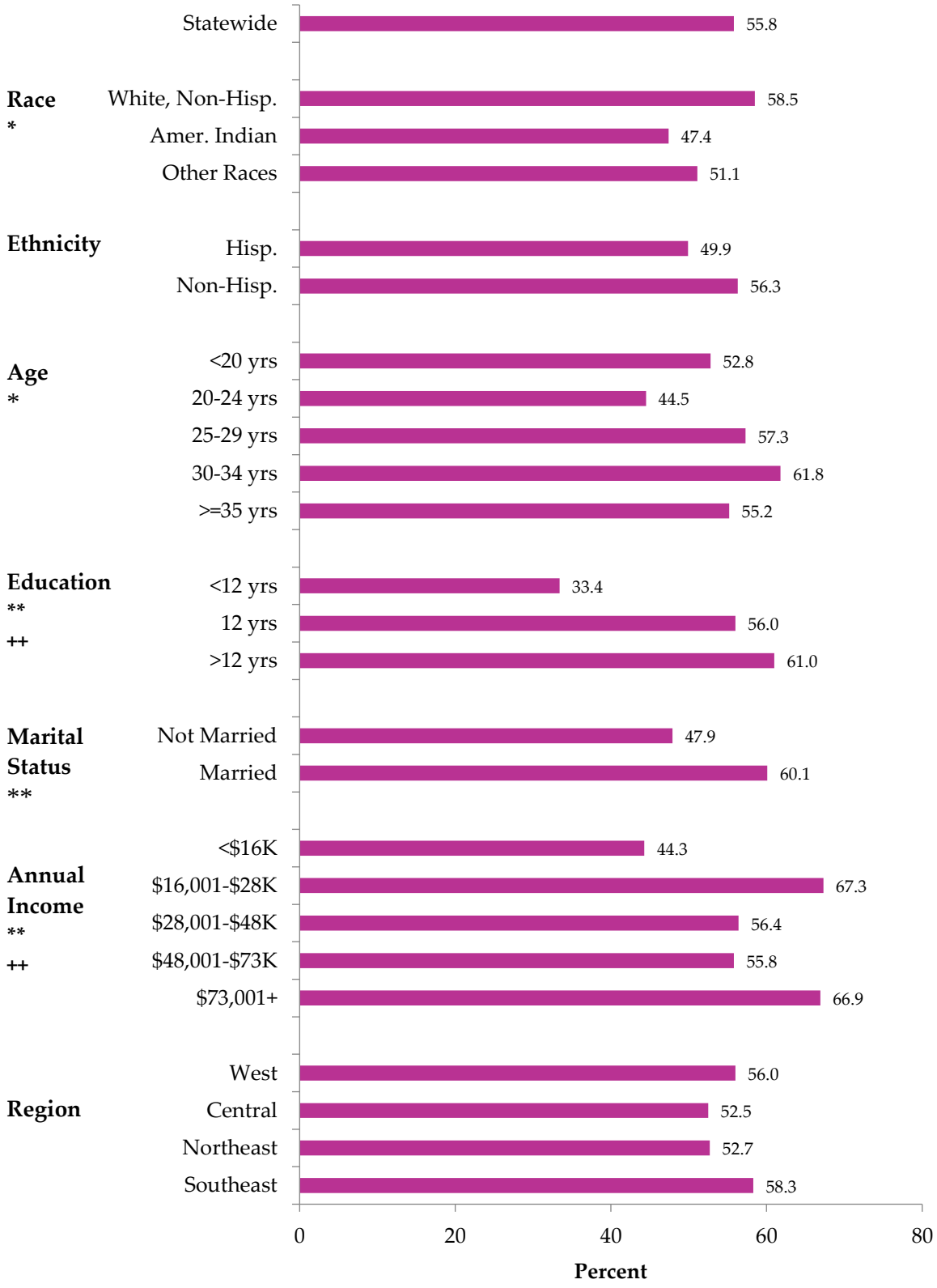
Mothers whose infant slept *without* soft objects or loose bedding, compared to mothers whose infant slept *with* soft objects or loose bedding, were significantly (p-value less than 0.05) *more likely* to report that:

- Their infant was born high birth weight (greater than 4000g) (12.1% vs. 5.5%).

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:

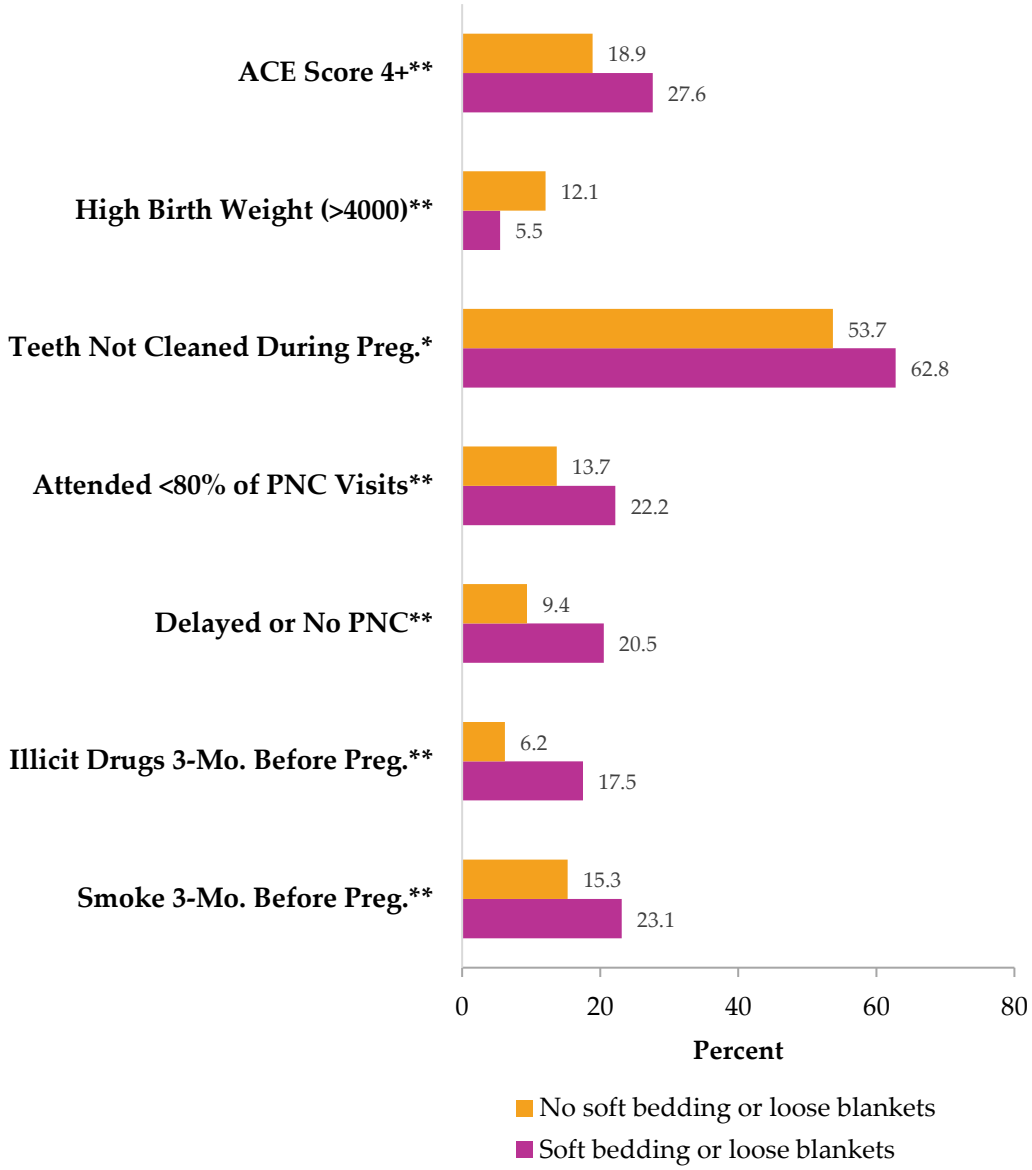
- They smoked the 3 months before pregnancy (15.3% vs. 23.1%).
- They used illicit drugs 3 months before pregnancy (6.2% vs. 17.5%).
- They started prenatal care after the first trimester or had no prenatal care (9.4% vs. 20.5%).
- They attended fewer than 80% of their prenatal visits (13.7% vs. 22.2%).
- They did not have teeth cleaned during pregnancy (53.7% vs. 62.8%).
- They had a high ACE score (4+) (18.9% vs. 27.6%).

Figure 18.8: Percentage of mothers whose infant slept without soft objects or loose bedding by demographic characteristics, South Dakota, 2020 (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 18.9: Risk behaviors and outcomes by mothers whose infant slept without soft objects or loose bedding, South Dakota, 2020 (weighted)



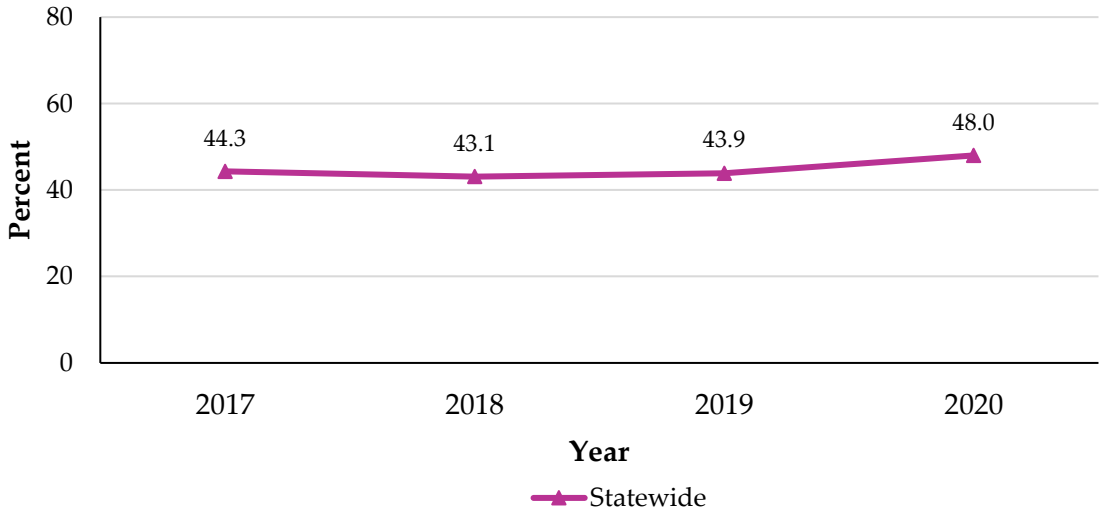
* p-value < 0.05, ** p-value < 0.01 p-value based on Rao-Scott chi-square test.
PNC = prenatal care; ACE = adverse childhood experiences

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 had their infant sleep alone in the mother's room without bed-sharing has not changed over time (p-value for linear trend greater than 0.05).

Figure 18.10: Mothers whose infant room-shared without bed-sharing by year, South Dakota, 2017-2020 (weighted)



Demographic Characteristics (Figure 18.11)

- Overall prevalence of South Dakota mothers whose infant room-shared without bed-sharing was 48.0%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with room-sharing without bed-sharing included maternal race, ethnicity, and marital status.
- Mothers who were of other races, Hispanic and married had a higher prevalence of room-sharing without bed-sharing compared with their counterparts.

Risk Behaviors and Outcomes (Figure 18.12)

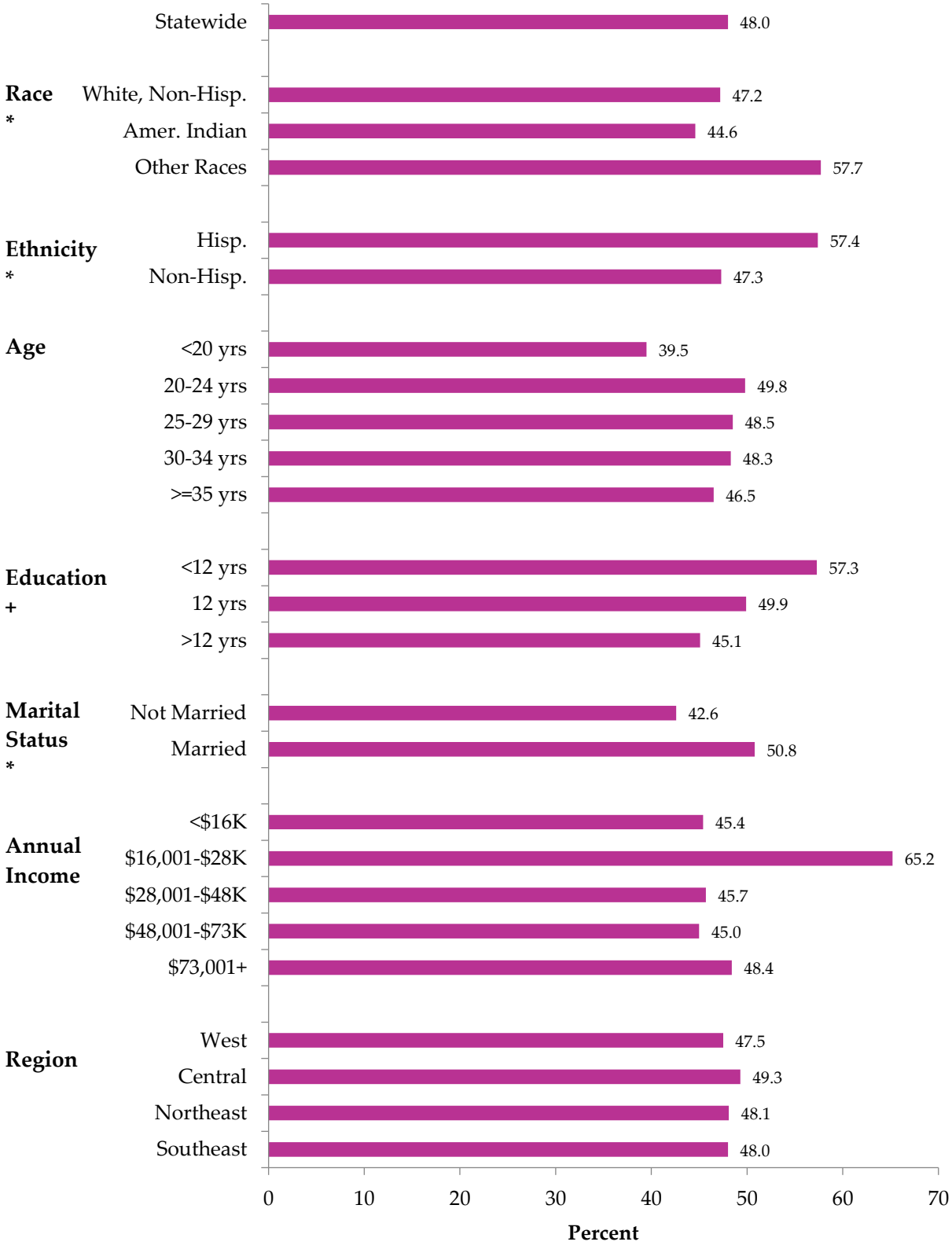
Mothers whose infant room-shared without bed-sharing, compared to mothers whose infant did not room-share without bed-sharing, were significantly (p-value less than 0.05) *more likely* to report that:

- They never breastfed their infant (13.1% vs. 7.5%)

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:

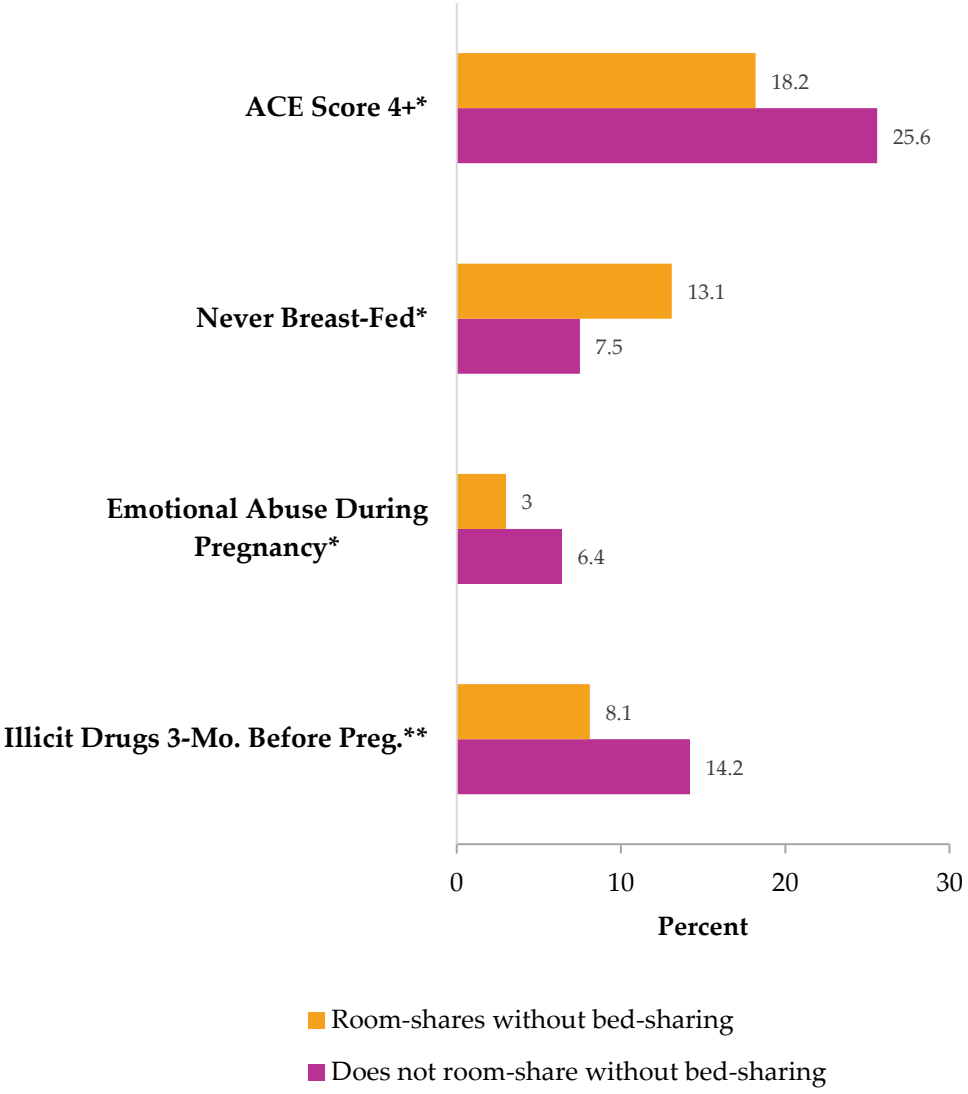
- They used illicit drugs the 3 months before pregnancy (8.1% vs. 14.2%).
- They suffered emotional abuse during pregnancy (3.0% vs. 6.4%)
- They had a high ACE score (4+) (18.2% vs. 25.6%).

Figure 18.11: Percentage of mothers whose infant room-shares without bed-sharing by demographic characteristics, South Dakota, 2020 (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 18.12: Risk behaviors and outcomes by mothers whose infant room-shares without bed-sharing, South Dakota, 2020 (weighted)



* 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

1. Centers for Disease Control and Prevention. Sudden unexpected infant death and sudden infant death syndrome: Data and statistics. 2018; https://www.cdc.gov/sids/data.htm#cause. Accessed 12/17/2018.
2. Lambert ABE, Parks SE, Shapiro-Mendoza CK. National and state trends in sudden unexpected infant death: 1990-2015. Pediatr. 2018;141(3):e20173519.
3. AAP Task Force on Sudden Infant Death Syndrome. SIDS and Other Sleep-Related Infant Deaths: Updated 2016. Recommendations for a Safe Infant Sleeping Environment. Pediatrics. 2016;138(5):e20162938.

Chapter 19: Postpartum health and birth control use

Measure	% of women (95% CI, N)	
Services women received postpartum		
Attended postpartum health check-up	87.4	(85.4-89.3, 9021)
Among those women with a postpartum check-up, the following was done		
Told to take a vitamin with folic acid	57.2	(53.3-61.1, 5149
Discussed healthy eating, exercise, and losing weight gained during pregnancy	54.6	(50.7-58.5, 4908)
Discussed how long to wait before getting pregnant again	52.6	(48.7-56.6, 4730)
Discussed birth control methods	88.5	(86.0-91.0, 7875)
Given or prescribed a contraceptive method	38.5	(34.7-42.3, 3434)
Inserted an IUD or a contraceptive implant	20.3	(17.1-23.4, 1809)
Asked about smoking cigarettes	63.8	(59.9-67.6, 5713)
Asked if someone was being abusive either emotionally or physically	67.9	(64.1-71.6, 6080)
Asked about feeling down or depressed	92.0	(89.9-94.2, 8261)
Tested for diabetes	14.6	(12.1-17.2, 1307)
Use of postpartum birth control		
Women who were using postpartum birth control	80.2	(77.4-83.0, 8275)
Among women who were not pregnant or trying to get pregnant at the time of the survey, type of contraceptive being used		
None	19.2	(16.3-22.0, 1888)
Least effective contraceptive	26.0	(22.7-29.2, 2556)
Moderately effective contraceptive	26.4	(23.1-29.6, 2596)
Most effective contraceptive	28.5	(25.1-31.8, 2802)
Among women who were not using postpartum birth control, reasons for non-use:		
Did not want to use birth control	52.3	(44.6-60.0, 1103)
Worried about side effects from birth control	32.0	(24.8-39.2, 675)
Not having sex	22.4	(16.0-28.9, 473)
Wanted to get pregnant	20.8	(14.3-27.2, 438)
Her husband or partner didn't want to use anything	8.4	(4.5-12.3, 177)
Had problems paying for birth control	2.5	(0.9-4.1, 52)^
Currently pregnant	1.8	(0.1-3.6, 39)^
Had tubes tied or blocked	1.6	(0.1-3.2, 34)^
Depressive symptoms, postpartum	12.6	(10.3-15.0, 1299)

^ 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.

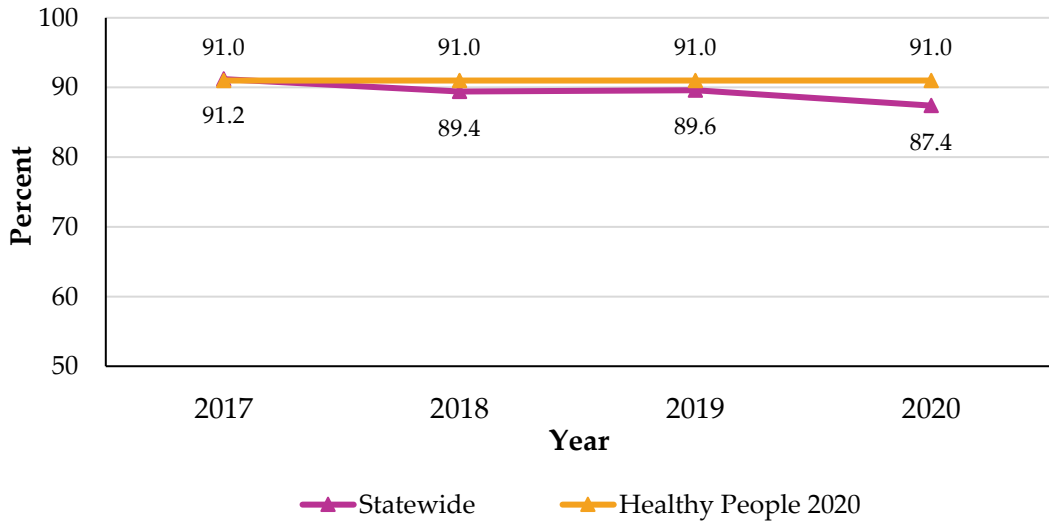
Effectiveness of birth control was defined as 1) most effective [female/male sterilization, implant, IUD], 2) moderately effective [DMPA, pills, patch/ring], 3) least effective [condoms, NFP, withdrawal], or 4) no method.

Attended Postpartum Visit

Prevalence and Trends (Figure 19.1)

The percentage of South Dakota mothers who attended a postpartum visit **has decreased** over time (p-value for linear trend less than 0.05). The Healthy People 2020 goal of 91% was only achieved in 2017.

Figure 19.1: Mothers who attended a postpartum visit by year, South Dakota, 2017-2020 (weighted)



Demographic Characteristics (Figure 19.2)

- Overall prevalence of South Dakota mothers who attended a postpartum visit was 87.4%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with attending a postpartum visit 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, between 30-34 years of age, had great than High School education, were married, and who had greater household income had a higher prevalence of attending a postpartum visit compared with their counterparts. Mothers from the Northeast and Southeast regions had the highest prevalence of attending a postpartum visit.

Risk Behaviors and Outcomes (Figure 19.3)

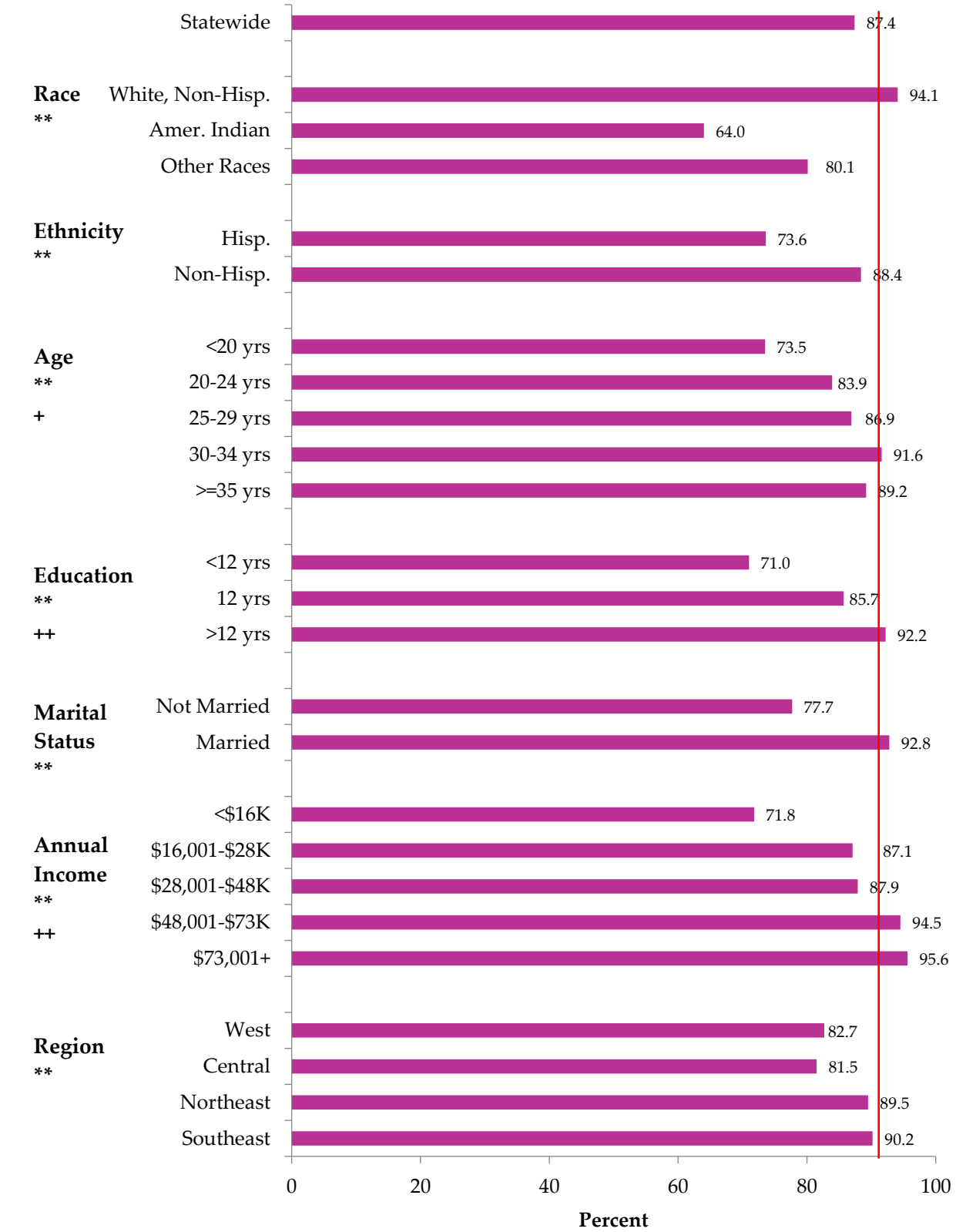
Mothers who attended a postpartum visit, compared to mothers who did not attend a postpartum visit, were significantly (p-value less than 0.05) *more likely* to report that:

- They drank alcohol the 3 months before pregnancy (67.5% vs. 53.8%).

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 smoked the 3 months before pregnancy (16.9% vs. 31.6%).
- They used illicit drugs the 3 months before pregnancy (9.7% vs. 26.3%).
- They started prenatal care after the first trimester or had no prenatal care (12.2% vs. 29.9%).
- They attended fewer than 80% of their prenatal visits (15.0% vs. 35.0%).
- They did not have their teeth cleaned during pregnancy (55.9% vs. 74.7%).
- They suffered emotional abuse during pregnancy (4.0% vs. 10.9%).
- Their baby is exposed to smoke (1.1^% vs. 3.6^%; interpret these percentages with caution).
- They had a high ACE score (4+) (21.2% vs. 30.6%).

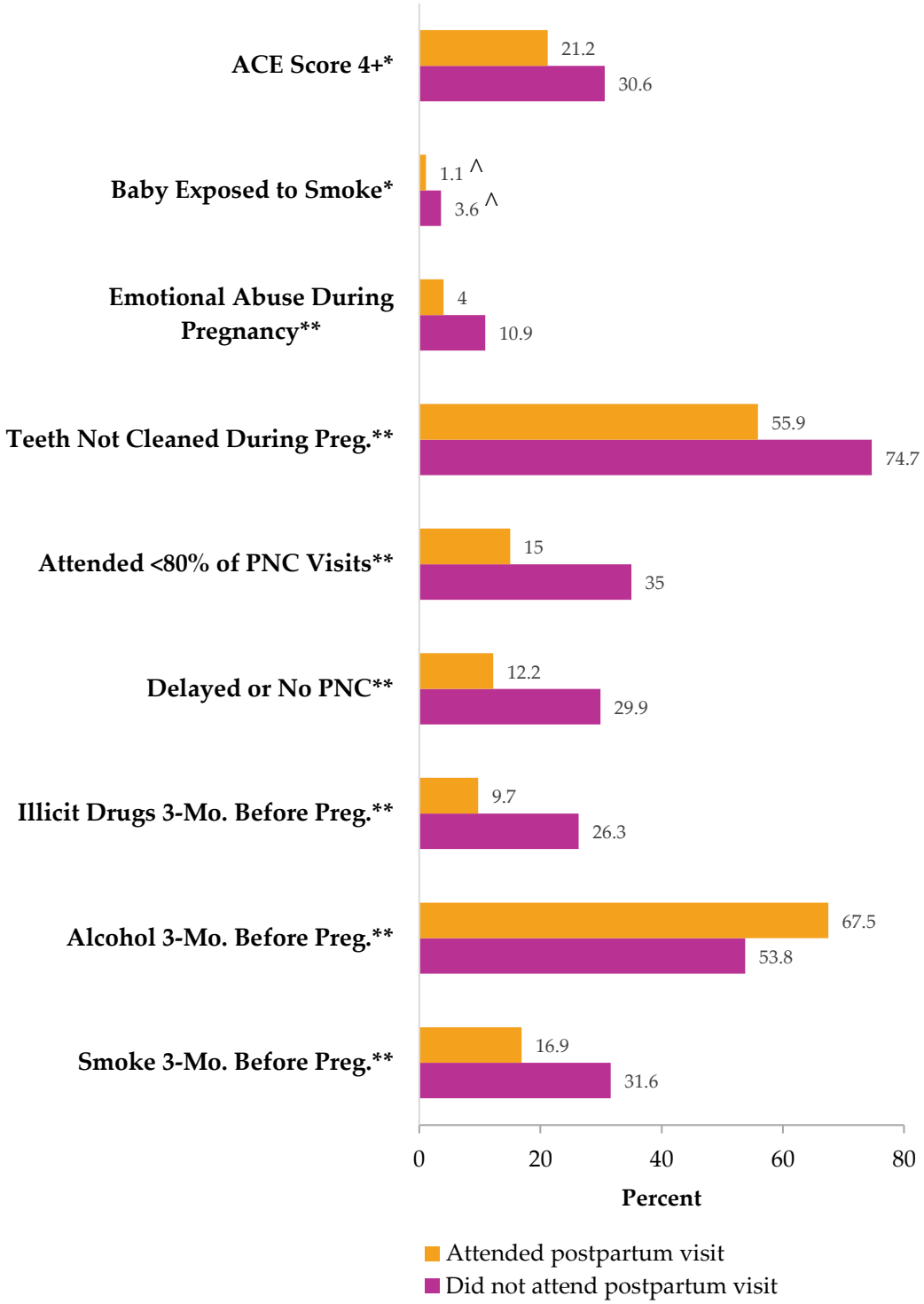
Figure 19.2: Percentage of mothers who attended a postpartum visit by demographic characteristics, South Dakota, 2020 (weighted)



** 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.

— Healthy People 2020 (91%)

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



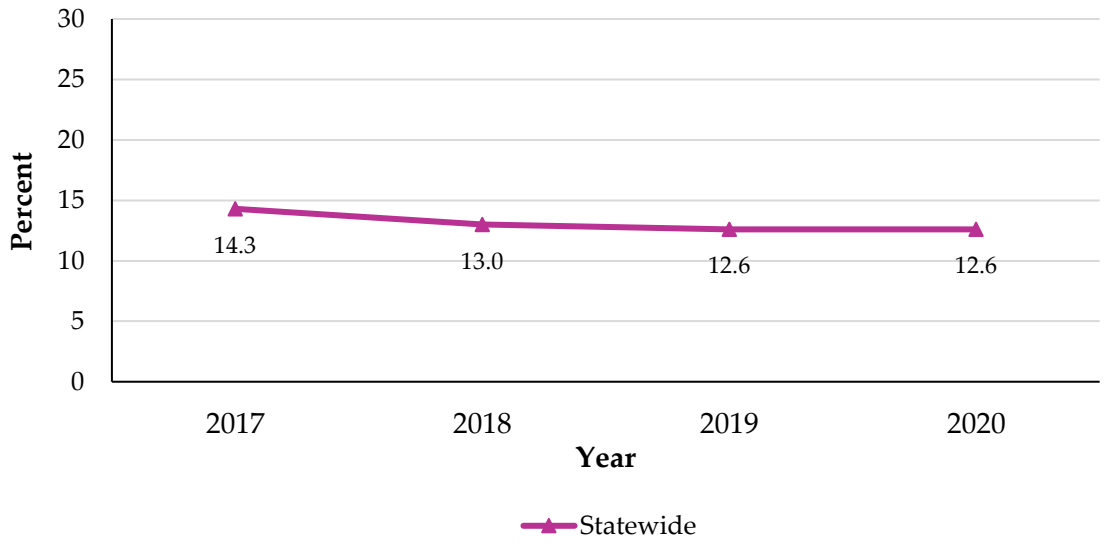
* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
PNC = prenatal care; ACE = adverse childhood experiences

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 over time (p-value for linear trend greater than 0.05).

Figure 19.4: Mothers who had indication of postpartum depression by year, South Dakota, 2017-2020 (weighted)



Demographic Characteristics (Figure 19.5)

- Overall prevalence of South Dakota mothers who had indications of postpartum depression was 12.6%.
- 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, less than 20 years of age, had less than High School education, were not married, and had household income less than $16,000 had a higher prevalence of postpartum depression compared with their counterparts.

Risk Behaviors and Outcomes (Figure 19.6)

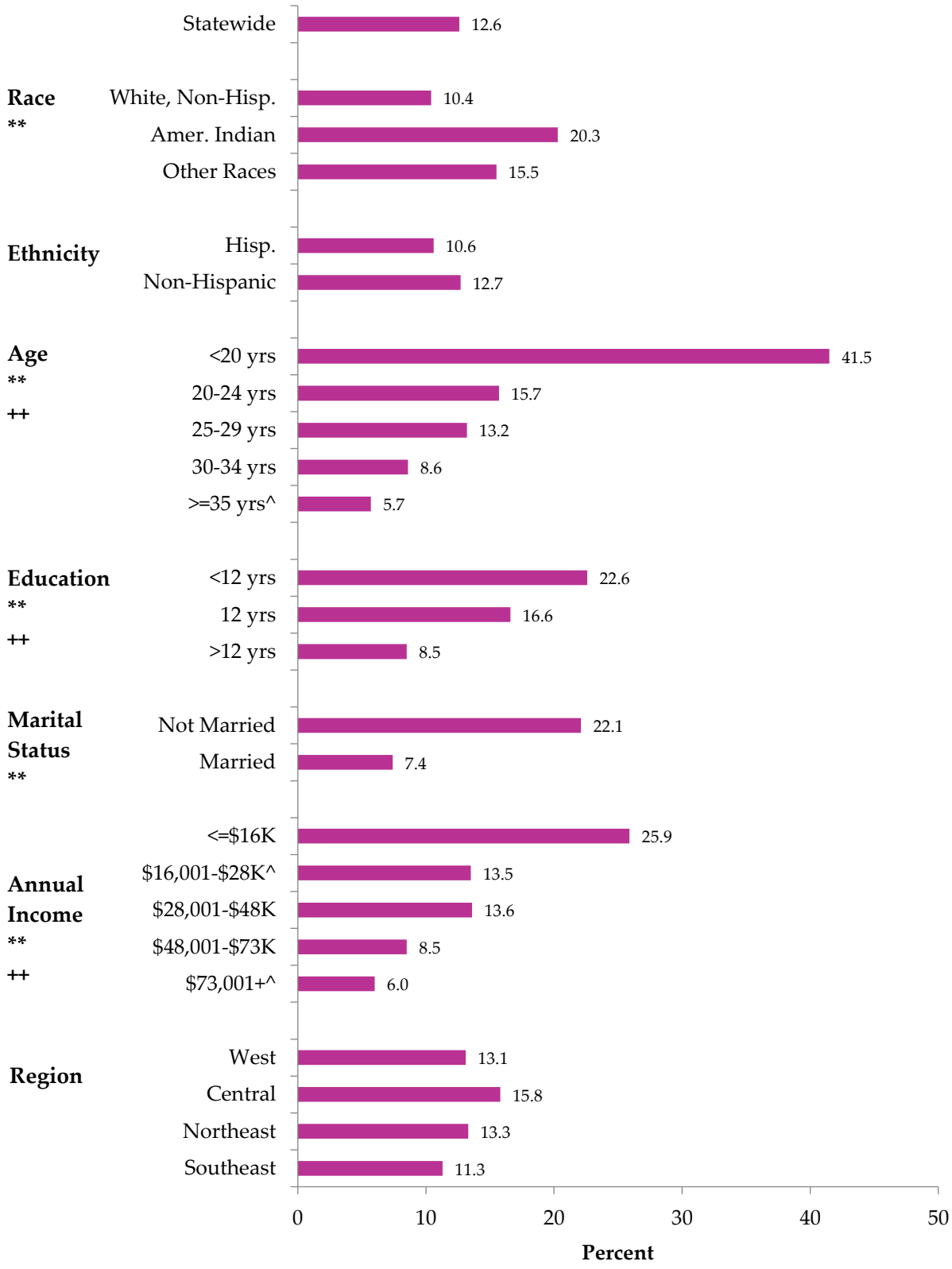
Mothers who had postpartum depression, compared to mothers who did not have postpartum depression, were significantly (p-value less than 0.05) *more likely* to report that:

- They smoked the 3 months before pregnancy (34.1% vs. 16.7%).
- They used illicit drugs the 3 months before pregnancy (30.2% vs. 9.2%).
- They suffered emotional abuse during pregnancy (14.6% vs. 3.2%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (66.0% vs. 32.8%).
- They had a high ACE score (4+) (39.4% vs. 19.8%).

Mothers who had postpartum depression, compared to mothers who did not have postpartum depression, were significantly (p-value less than 0.05) *less likely* to report that:

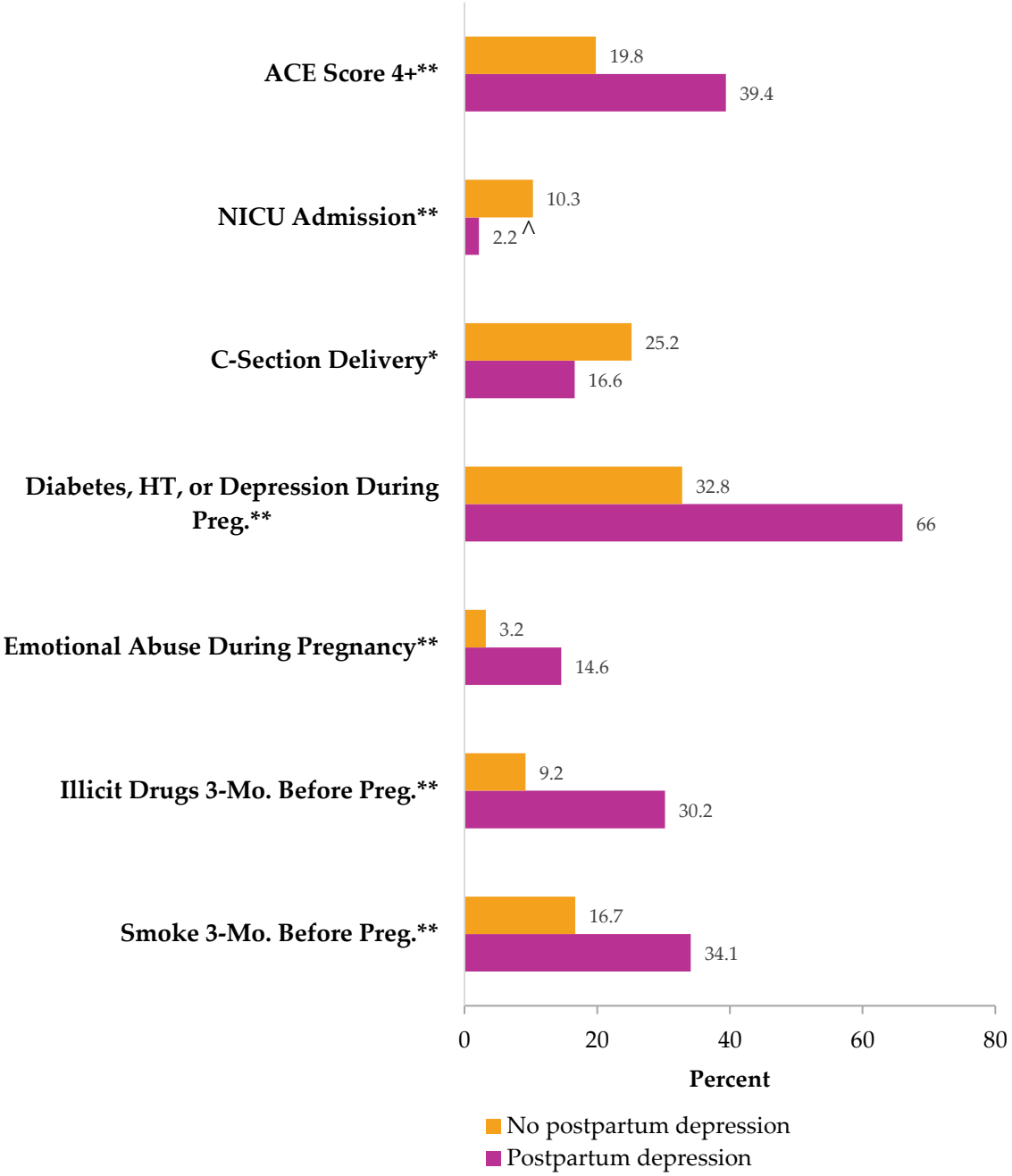
- They had a cesarean section delivery (16.6% vs. 25.2%).
- Their infant was admitted to the NICU (2.2^% vs. 10.3%; interpret these percentages with caution).

Figure 19.5: Percentage of mothers who exhibited postpartum depressive symptoms by demographic characteristics, South Dakota, 2020 (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.
^ Too few cases to meet precision standard, interpret with caution (RSE 30% or higher).

Figure 19.6: Risk behaviors and outcomes by mothers who exhibited symptoms of postpartum depression, South Dakota, 2020 (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

References

1. U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau. Child Health USA 2013. *U.S. Department of Health and Human Services,* 2013. https://mchb.hrsa.gov/chusa13/health-services-utilization/p/postpartum-visit-well-baby-care.html, accessed June, 2019.

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

Measure	% of women (95% CI, N)	
ACE Score		
0	39.4	(35.9-42.9, 4041)
1	18.1	(15.3-20.9, 1853)
2	10.6	(8.4-12.8, 1086)
3	9.5	(7.4-11.5, 970)
4 or greater	22.4	(19.5-25.4, 2297)
ACEs		
Parental divorce or separation	38.9	(35.5-42.4, 3965)
Household substance abuse	29.7	(26.5-33.0, 3041)
Household mental illness	25.4	(22.3-28.5, 2594)
Incarcerated household member	9.9	(8.0-11.9, 1012)
Sexual abuse	14.2	(11.7-16.6, 1444)
Emotional abuse	25.2	(22.1-28.3, 2558)
Physical abuse	15.7	(13.1-18.3, 1598)
Emotional neglect	17.2	(14.5-19.8, 1747)
Physical neglect	6.6	(4.9-8.3, 670)
Mother treated violently	10.6	(8.5-12.8, 1078)
Handling life events		
Bounces back quickly after hard times	63.3	(59.8-66.8, 6552)
Hard time making it through stressful events	15.8	(13.2-18.4, 1637)
Does not take long to recover from a stressful event	48.4	(44.8-52.0, 5013)
Hard to snap back when something bad happens	12.4	(10.1-14.8, 1289)
Usually comes through a difficult time with little trouble	45.8	(42.3-49.4, 4745)
Takes a long time to get over set-backs	8.9	(6.9-10.9, 918)

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.

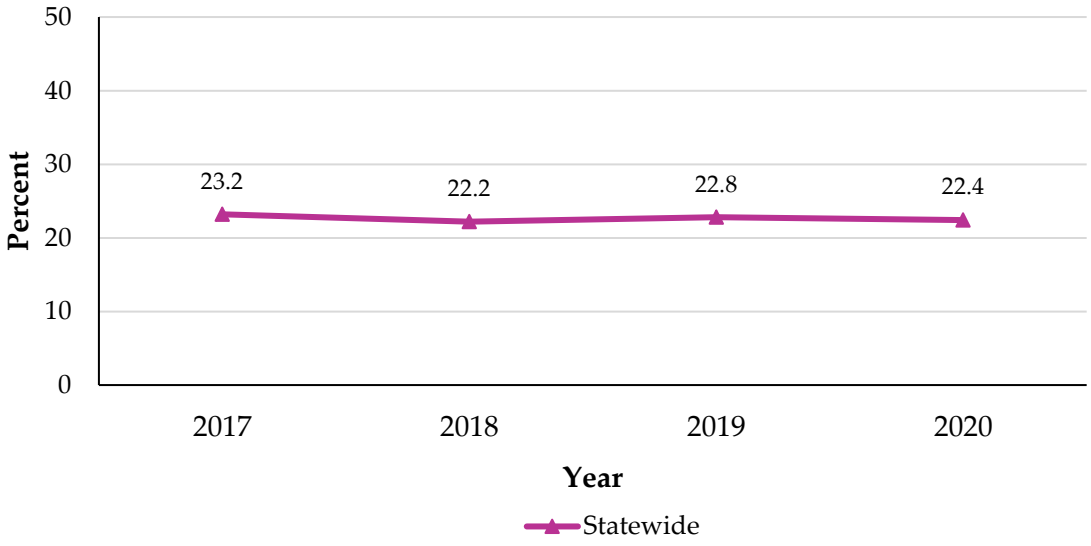
Category	Specific question:
Abuse	
Sexual abuse	Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way **OR** attempt or actually have oral, anal, or vaginal intercourse with you?
Emotional abuse	Did a parent or other adult in the 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?
Physical abuse	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?
Neglect	
Emotional neglect	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?
Physical Neglect	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?
Household (HH) dysfunction	
Parental divorce or separation	Were your parents ever separated or divorced?
HH Substance abuse	Did you live with someone who was a problem drinker or alcoholic or who used street drugs?
HH Mental illness	Was a household member depressed or mentally ill, or did a household member attempt suicide?
Incarcerated HH member	Did a household member go to prison?
Mother treated violently	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?

High ACE Score (4+)

Prevalence and Trends (Figure 20.1)

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

Figure 20.1: Mothers with a high ACE (4+) score by year, South Dakota, 2017-2020 (weighted)



Demographic Characteristics (Figure 20.2)

- Overall prevalence of South Dakota mothers who had high a high ACE score (4+) was 22.4%.
- 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, 20-24 years of age, had High School education, were not married, and had household income less than $16,000 had a higher prevalence of a high ACE score compared with their counterparts.

Risk Behaviors and Outcomes (Figure 20.3)

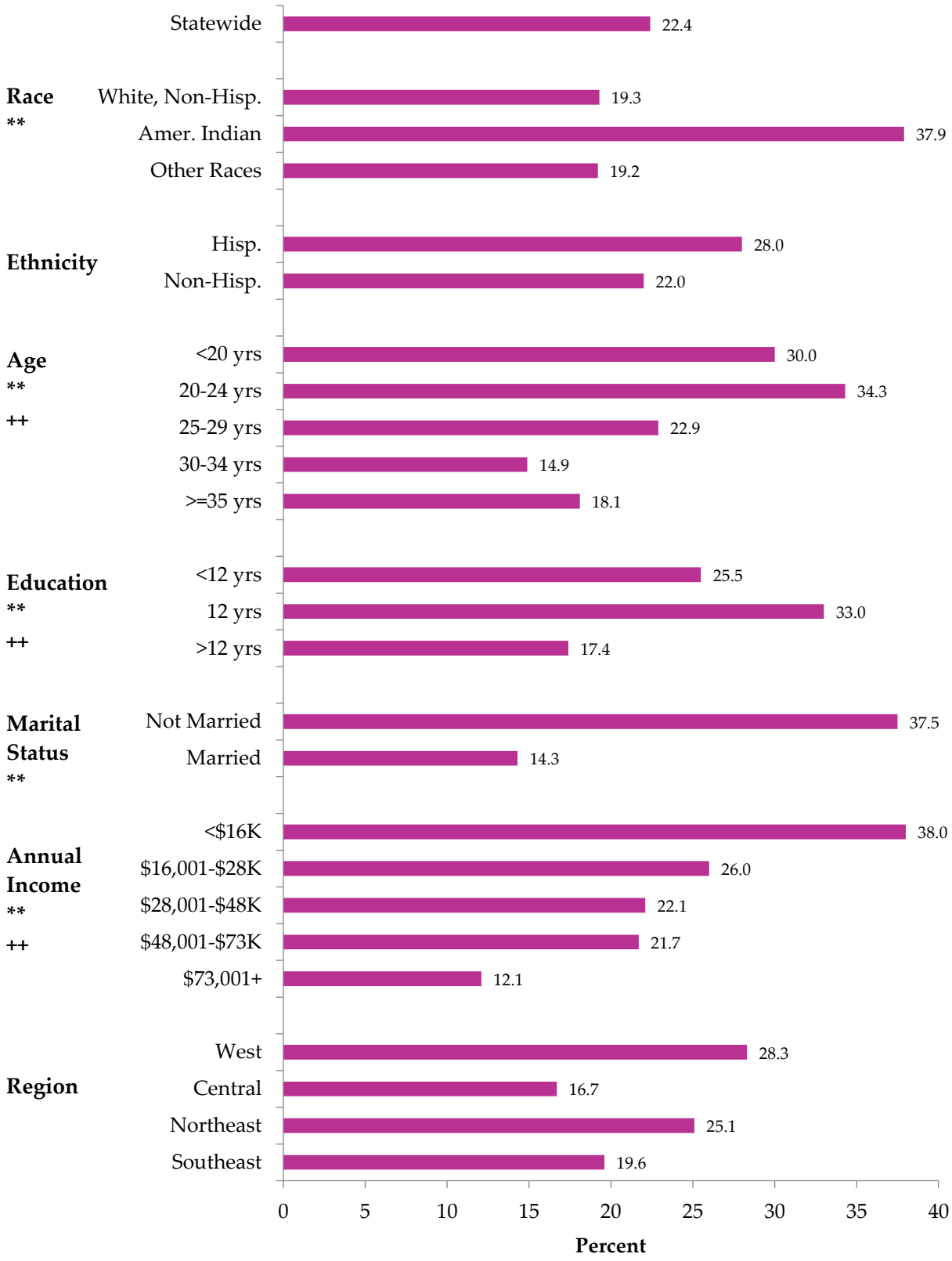
Mothers who had high ACE scores, compared to mothers who did not have high ACE scores, were significantly (p-value less than 0.05) *more likely* to report that:

- They were uninsured before pregnancy (21.0% vs. 12.6%).
- They smoked the 3 months before pregnancy (36.2% vs. 13.3%).
- They used illicit drugs the 3 months before pregnancy (24.4% vs. 8.0%).
- They had obesity prior to pregnancy (36.7% vs. 25.5%).
- They did not have their teeth cleaned during pregnancy (73.3% vs. 53.7%).
- They suffered emotional abuse during pregnancy (10.4% vs. 3.3%).
- They had diabetes, hypertension, or depression diagnosed during pregnancy (49.1% vs. 33.0%).
- Their infant was never breast-fed (16.0% vs. 8.3%)
- Their infant does not sleep alone in the mother's room (60.5% vs. 49.8%).

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

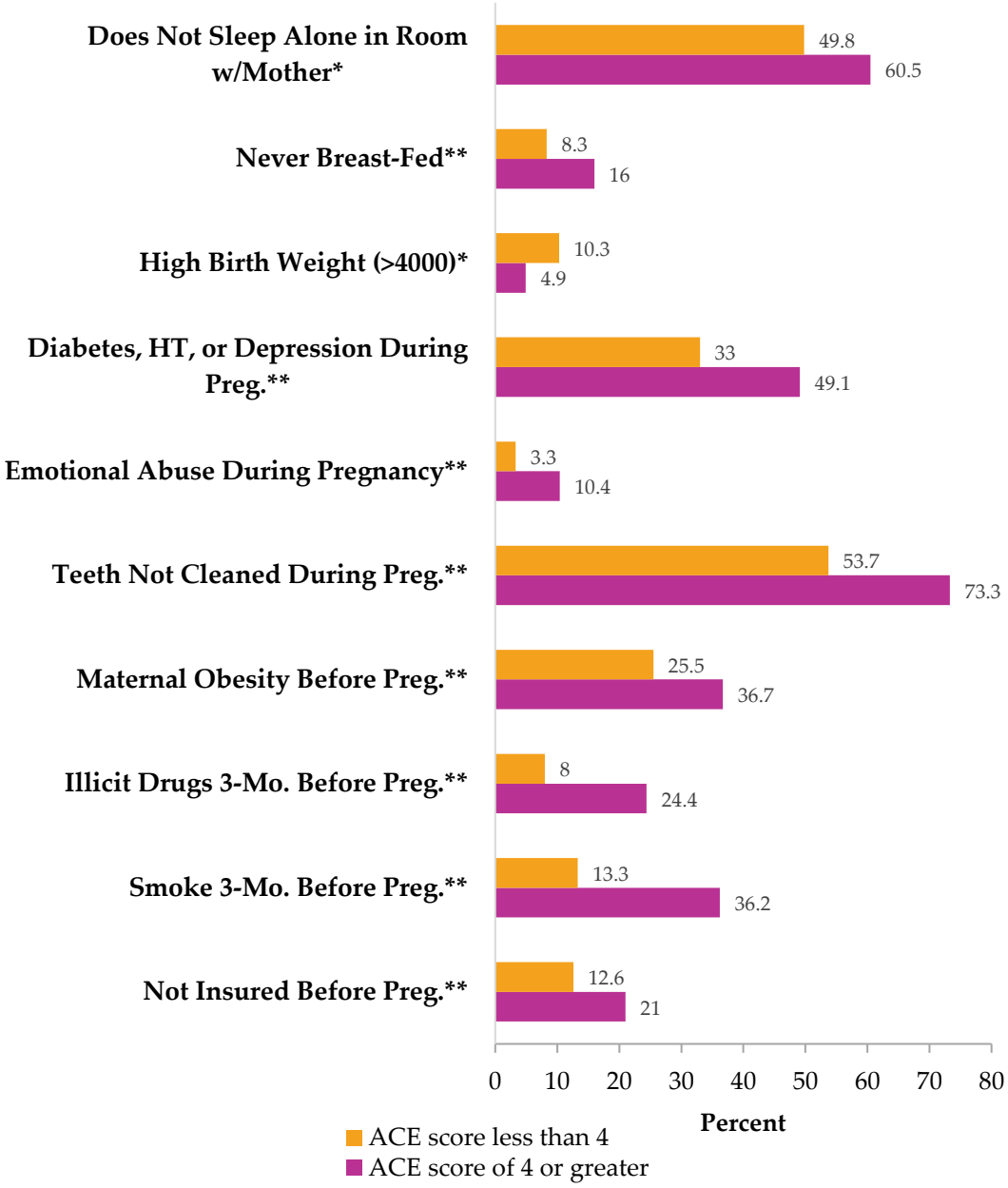
- Their infant was high birth weight (greater than 4000 g) (4.9% vs. 10.3%).

Figure 20.2: Percentage of mothers with a high ACE score (greater or equal to 4) by demographic characteristics, South Dakota, 2020 (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 20.3: Risk behaviors and outcomes by mothers with a high ACE Score (greater than or equal to 4), South Dakota, 2020 (weighted)



* p-value < 0.05, ** p-value < 0.01
p-value based on Rao-Scott chi-square test.
PNC = prenatal care

References

1. Felitti VJ, Anda RF, Nordenberg DF, Williamson DF, Spitz AM, Edwards V, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine* 14:245-58, 1998.

2. Dube SR, Felitti VJ, Dong M, Giles WH, Anda RF. The impact of adverse childhood experiences on health problems: Evidence from four birth cohorts dating back to 1900. *Preventive Medicine* 37:268-77, 2003.

3. Chapman DP, Whitfield CL, Felitti VJ, Dube SR, Edwards VJ, Anda RF. Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders* 82:217-25, 2004.

4. Mersky, JP, Topitzes J, Reynolds AJ. Impacts of adverse childhood experiences on health, mental health, and substance use in early adulthood: A cohort study of an urban, minority sample in the U.S. *Child Abuse and Neglect* 37:917-925, 2013.

Chapter 21: Health insurance

Measure^	% of women (95% CI, N)	
Coverage the month before pregnancy		
No insurance	14.4	(12.0-16.9, 1500)
Medicaid	14.1	(12.1-16.1, 1465)
Indian Health Service	9.2	(8.3-10.1, 955)
Private health insurance from job or the job of husband or partner	53.5	(50.1-57.0, 5563)
Private health insurance from parents	5.9	(4.0-7.8, 612)
Private health insurance from Health Insurance Marketplace/HealthCare.gov	4.3	(2.8-5.9, 451)
Other health insurance	6.1	(4.3-7.9, 633)
Coverage prenatal care		
I did not go for prenatal care	3.0	(1.8-4.1, 309)
No insurance	2.8	(1.6-4.0, 281)
Medicaid	33.2	(30.2-36.3, 3350)
Indian Health Service	7.6	(6.7-8.6, 770)
Private health insurance from job or the job of husband or partner	53.5	(50.0-56.9, 5389)
Private health insurance from parents	4.6	(2.9-6.3, 465)
Private health insurance from Health Insurance Marketplace/HealthCare.gov	4.0	(2.5-5.5, 402)
Other health insurance	6.4	(4.6-8.2, 647)
Coverage after delivery **		
No insurance	9.6	(7.6-11.6, 996)
Medicaid	23.6	(20.9-26.3, 2450)
Indian Health Service	8.0	(7.1-8.9, 830)
Private health insurance from job or the job of husband or partner	54.5	((51.1-57.9, 5661)
Private health insurance from parents	4.3	(2.7-5.9, 448)
Private health insurance from Health Insurance Marketplace/HealthCare.gov	3.9	(2.4-5.4, 406)
Other health insurance	5.7	(4.0-7.4, 593)

^ 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

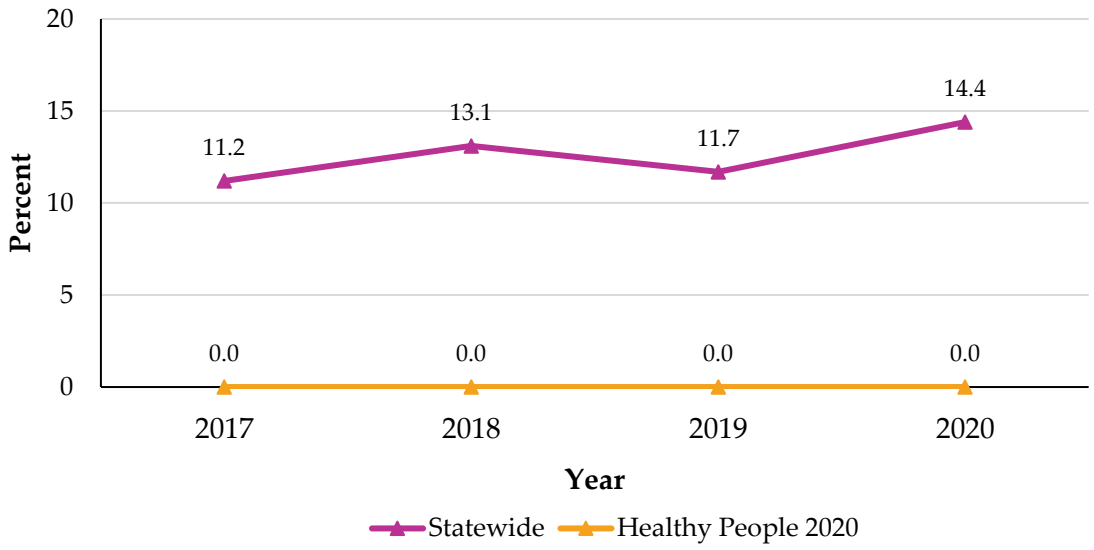
- **AHS-1.1** Increase the proportion of persons with medical insurance to 100% *(0% for uninsured).*

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 over time (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, 2017-2020 (weighted)



Demographic Characteristics (Figure 21.2)

- Overall prevalence of South Dakota mothers who were uninsured before pregnancy was 14.4%.
- Demographic characteristics that were significantly (p-value less than 0.05) associated with being uninsured before pregnancy included maternal race, ethnicity, age, education, marital status, and household income.
- Mothers who were of other races, Hispanic, between 20-24 years of age, had High school education, were 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)

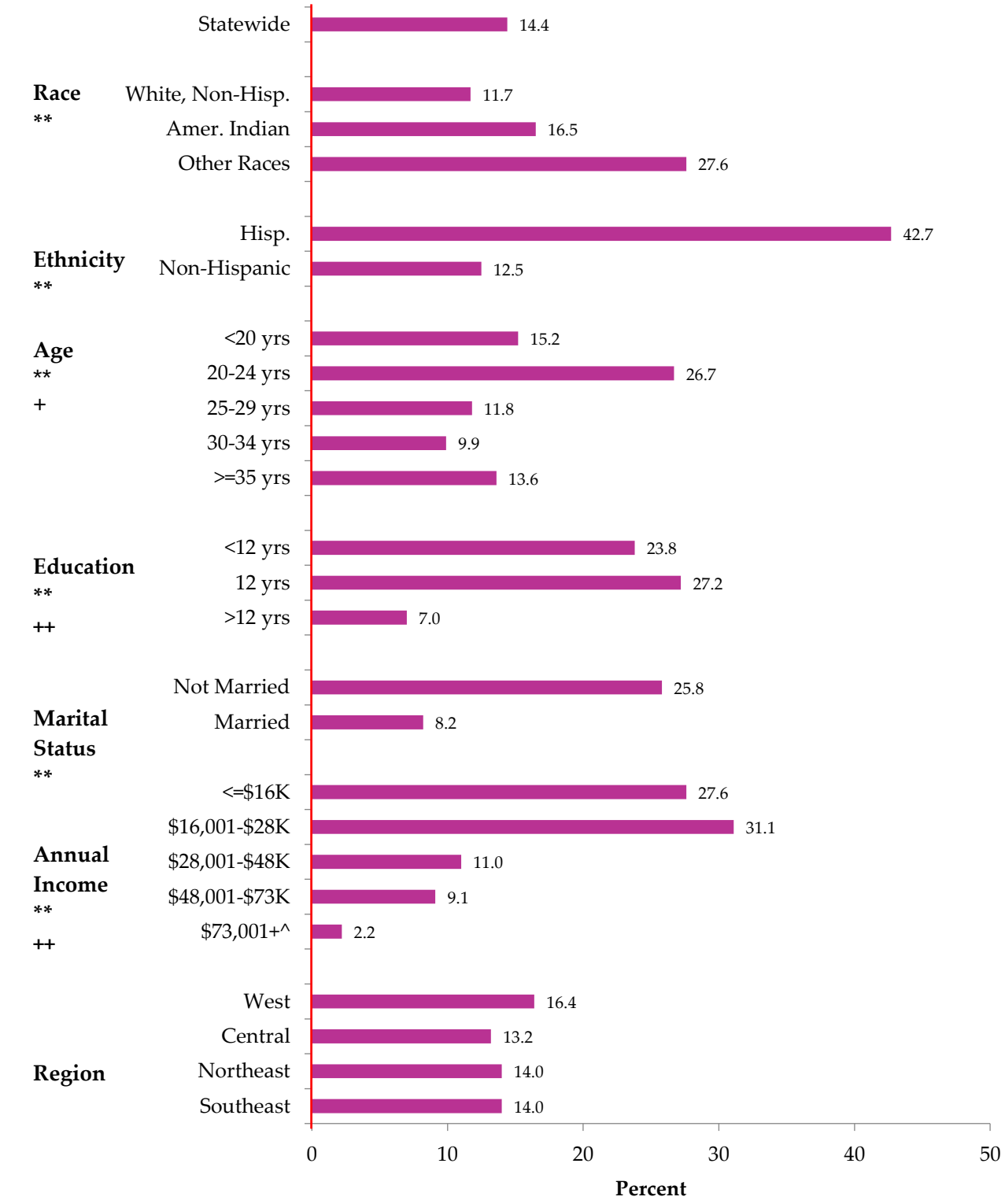
Mothers who had no insurance coverage the month before pregnancy, compared to mothers who did, were significantly (p-value less than 0.05) *more likely* to report that:

- They smoked the 3 months before pregnancy (40.8% vs. 15.1%).
- They used illicit drugs the 3 months before pregnancy (20.0% vs. 10.4%).
- They started prenatal care after the first trimester or had no prenatal care (29.6% vs. 11.8%).
- They did not have their teeth cleaned during pregnancy (81.2% vs. 54.5%).
- They suffered emotional abuse during pregnancy (9.2% vs. 4.2%).
- They never breastfed their infant (17.7% vs. 8.8%).
- They had a high ACE score (4+) (32.5% vs. 20.7%).

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 (52.1% vs. 67.9%).
- They had a cesarean section delivery (16.3% vs 25.3%).

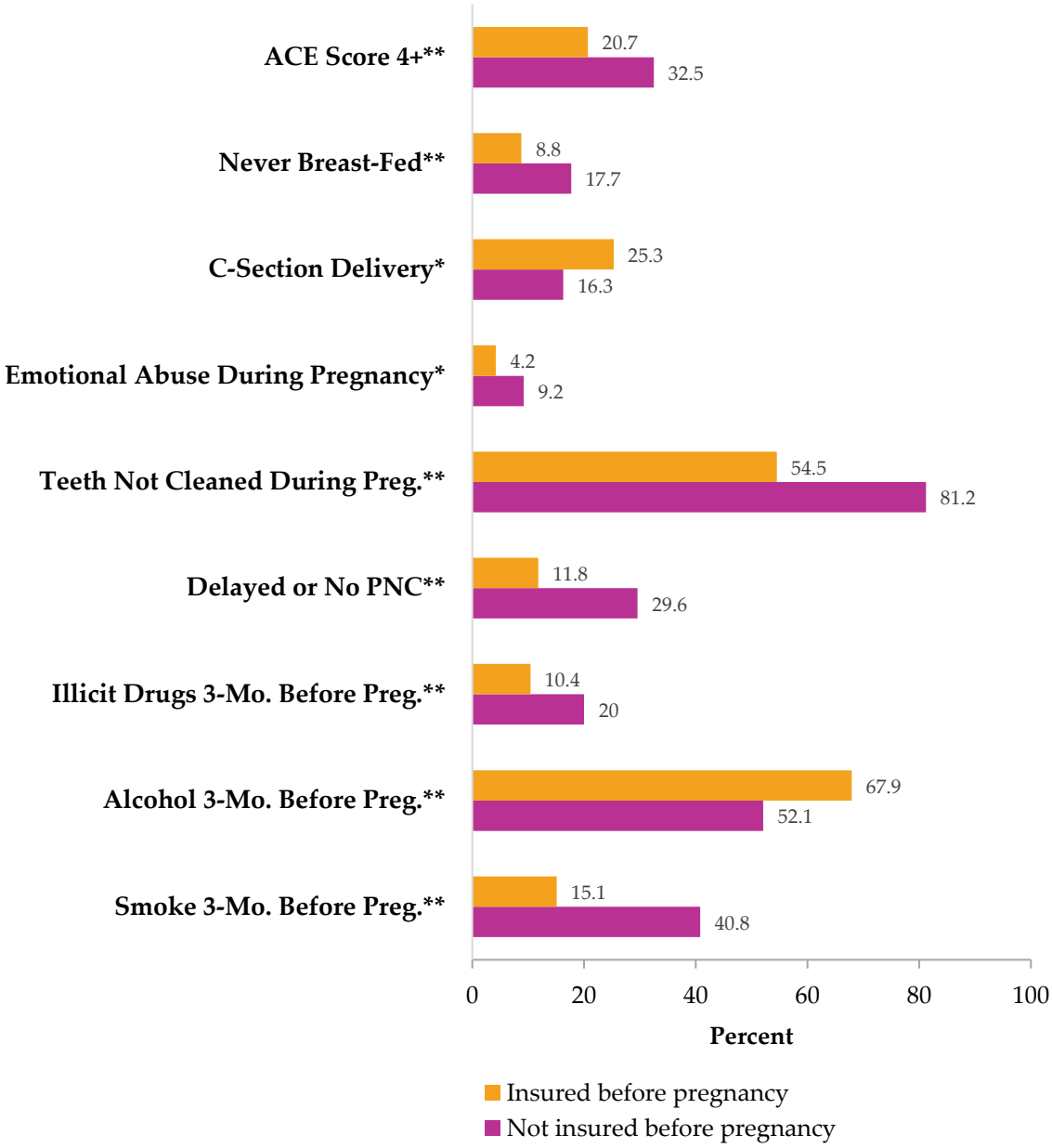
Figure 21.2: Percentage of mothers with no insurance coverage the month before pregnancy by demographic characteristics, South Dakota, 2020 (weighted)



** p-value < 0.01 based on Rao-Scott chi-square test.
++ p < 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 (100% insured, *0% uninsured*)

Figure 21.3: Risk behaviors and outcomes by mothers with no insurance coverage before pregnancy, South Dakota, 2020 (weighted)



* 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

1. "Women's Health Insurance Coverage, Women's Health Policy". Kaiser Family Foundation, October 21st, 2016. https://www.kff.org/womens-health-policy/fact-sheet/womens-health-insurance-coverage-fact-sheet/, accessed September 2017.

2. Lu MC, Lin YG, Prietto NM, Garite TJ. Elimination of public funding of prenatal care for undocumented immigrants in California: A cost/benefit analysis. *American Journal of Obstetrics and Gynecology* 182:233-239, 2000.

3. Hueston W, Quattlebaum R, Benich J. How much money can early prenatal care for teen pregnancies save? A cost-benefit analysis. *Journal of the American Board of Family Medicine* 21(3):184-190, 2008.

Chapter 22: Household income

Measure	% of women (95% CI, N)
Household annual income during 12 months before delivery	
$0 to $16,000	20.1 (17.6-22.7, 1927)
$16,001 to $28,000	12.7 (10.3-15.1, 1219)
$28,001 to $48,000	15.9 (13.2-18.7, 1526)
$48,001 to $73,000	20.4 (17.3-23.5, 1957)
$73,001 or more	30.8 (27.3-34.3, 2952)
Federal Poverty Level (FPL)	
0-100%	30.3 (27.2-33.3, 2883)
101-150%	13.7 (11.1-16.2, 1301)
>150%	56.1 (52.6-59.6, 5341)

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

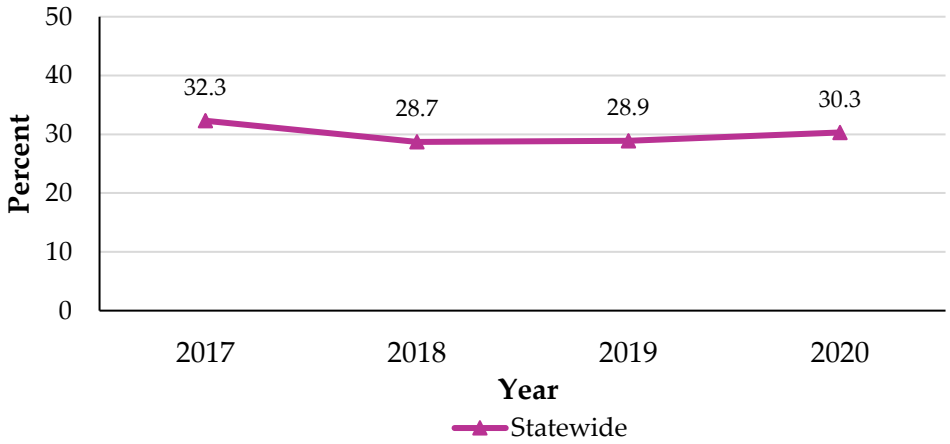
Federal poverty level (FPL) is used to measure a household's poverty status (1). Adjusted each year for inflation, the FPL can help determine if a family qualifies for certain government benefits, such as Medicaid; the Women, Infants and Children (WIC) program; food stamps; or funds for education.

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 over time (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, 2017-2020 (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 30.3%.
- 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, less than 20 years of age, had less than High School education, and were not married had a higher prevalence of being at or below 100% of the FPL compared with their counterparts. Mothers who resided in the Central region had the highest prevalence of being at or below 100% of the FPL.

Risk Behaviors and Outcomes (Figure 22.3)

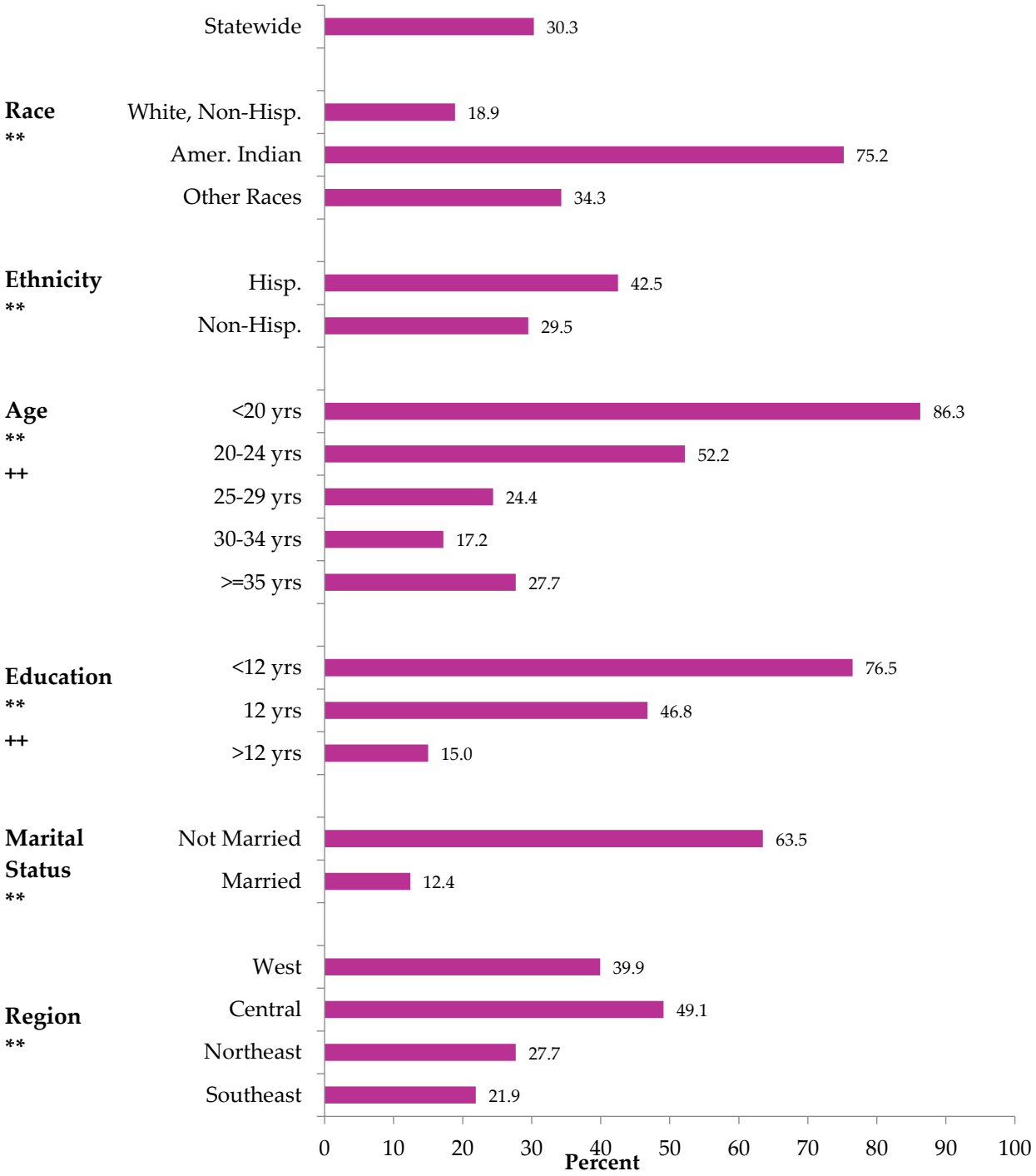
Mothers who had household incomes at or below 100% Federal Poverty Level, compared to mothers who had household incomes greater than 100% Federal Poverty Level, were significantly (p-value less than 0.05) *more likely* to report that:

- They were uninsured before pregnancy (29.0% vs. 7.0%).
- They smoked the three months before pregnancy (36.5% vs. 11.6%).
- They used illicit drugs the three months before pregnancy (25.4% vs. 6.1%).
- They started prenatal care after the first trimester or had no prenatal care (26.6% vs. 7.0%).
- They attended fewer than 80% of their prenatal visits (29.8% vs. 10.8%).
- They did not have their teeth cleaned during pregnancy (74.1% vs. 49.3%).
- They suffered emotional abuse during pregnancy (9.2% vs. 2.4%).
- They never breastfed their infant (21.4% vs. 5.6%).
- Their baby is exposed to smoke (3.7^% vs. 0.6%^); interpret these percentages with caution).
- They had a high ACE score (4+) (34.6% vs. 18.2%).

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:

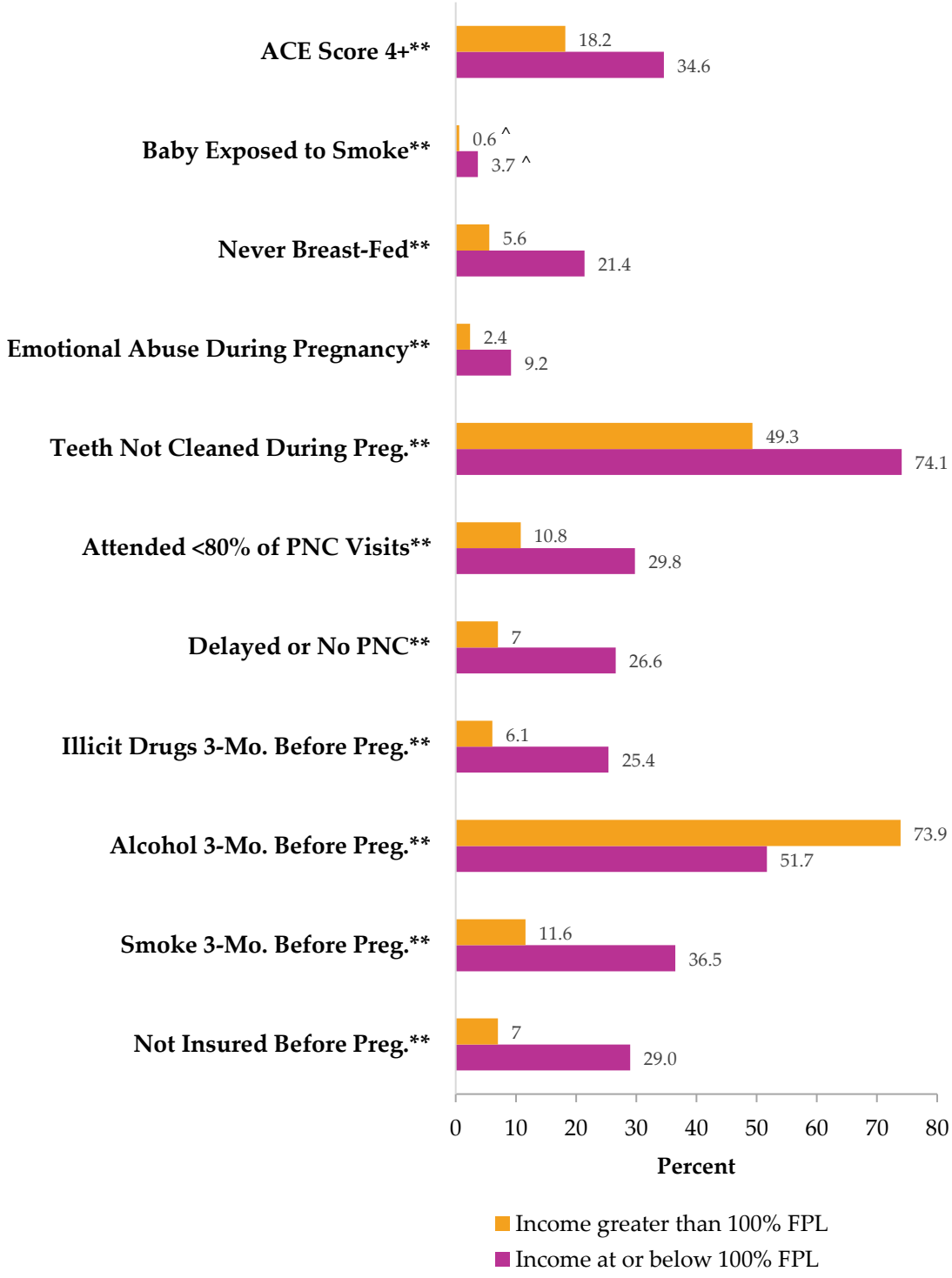
- They drank alcohol the 3 months before pregnancy (51.7% vs. 73.9%).

Figure 22.2: Percentage of mothers with a household income at or below 100% of the federal poverty level by demographic characteristics, South Dakota, 2020 (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, 2020 (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

References

1. HealthCare.gov. Federal Poverty Level (FPL). Available at: https://www.healthcare.gov/glossary/federal-poverty-level-fpl/ Accessed on March 8, 2019.

Appendices

Healthy People 2020 Objectives & SD PRAMS data

Crosswalk between Healthy People 2020 Healthy People 2030 Objectives

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Healthy People 2020 Objectives and SD 2020 PRAMS data

HP2020 Measure	Target Percentage	SD 2020 PRAMS*
AHS-1.1 Increase the proportion of persons with medical insurance.	100%	86%[1]
FP-1 Increase the proportion of pregnancies that are intended.	56%	56%
IID-12.10: Increase the percentage of pregnant women who are vaccinated against seasonal influenza.	80%	76%
IVP-39.1 Reduce physical violence by current or former intimate partners (developmental).	-	1.8%[2]
IVP-39.2 Reduce sexual violence by current or former intimate partners (developmental).	-	0.7%[2]
IVP-39.3 Reduce psychological abuse by current or former intimate partners (developmental).	-	4.9%[2]
MICH-8.1 Reduce low birth weight births (< 2,500 g).	7.8%	5.8%[4]
MICH-8.2 Reduce very low birth weight births (< 1,500 g).	1.2%	0.8%[4]
MICH-9.1 Reduce overall preterm births.	9.4%	9.0%
MICH-9.2 Reduce live births at 34 to 36 weeks of gestation.	6.8%	6.4%[4]
MICH-9.3 Reduce live births at 32 to 33 weeks of gestation.	1.1%	1.5%: 28-33 weeks[4]
MICH-9.4 Reduce very preterm or live births at less than 32 weeks of gestation.	1.5%	0.4%: < 28 weeks[4]
MICH-10.1 Increase prenatal care beginning in the first trimester.	78%	86%
MICH-10.2 Increase early and adequate prenatal care.	78%	75%[5]
MICH-11.1. Increase abstinence from alcohol among pregnant women.	98%	87%[6]
MICH-11.3 Increase abstinence from smoking cigarettes during pregnancy.	99%	91%[6]
MICH-11.4 Increase abstinence from illicit drugs among pregnant women.	100%	93%
MICH-16.1 Increase the proportion of women delivering a live birth who discussed preconception health with a health care worker prior to pregnancy.	27%	25%
MICH-16.2 Increase the proportion of women delivering a live birth who took multivitamins/folic acid daily prior to pregnancy.	33%	41%
MICH-16.3 Increase the proportion of women delivering a live birth who did not smoke prior to pregnancy.	88%	78%[7]
MICH-16.4 Increase proportion of women delivering a live birth who did not drink alcohol prior to pregnancy	56%	34%[8]
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.	58%	42%
MICH-16.6 Increase the proportion of women delivering a live birth who used a most effective or moderately effective contraception method postpartum.	59%	55%
MICH-18 Reduce postpartum relapse of smoking among women who quit smoking during pregnancy	38%	38%
MICH-19 Increase the proportion of women giving birth who attend a postpartum care visit with a health care worker.	91%	87%
MICH-20 Increase the proportion of infants who are put to sleep on their backs.	76%	88%
MICH-21.1 Increase the proportion of infants who are ever breastfed.	82%	90%
OH-10.2 Increase the proportion of children, adolescents and adults who used the oral health care system in the past year.	49%	42%[9]
TU-6 Increase smoking cessation during pregnancy	30%	10%

See https://www.healthypeople.gov/2020/topics-objectives for Healthy People 2020 Objectives.

[1] Before pregnancy; [2] during pregnancy by partner/husband; [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; [8] 3 months prior to pregnancy; [9] during 12 months before pregnancy

* Statewide estimates; green means at or better than HP 2020, while orange means worse by 10 percentage points or more than HP 2020.

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Crosswalk between Healthy People 2020 Objectives and Healthy People 2030 Objectives

HP2020 Measure	Target %	HP2030 Measure	Target %
AHS-1.1 Increase the proportion of persons with medical insurance.	100%	AHS-01 Increase the proportion of persons with medical insurance	92.1%
FP-1 Increase the proportion of pregnancies that are intended.	56%	FP-01 Reduce the proportion of pregnancies that are unintended	36.5%
IID-12.10: Increase the percentage of pregnant women who are vaccinated against seasonal influenza.	80%	IID-09 Increase the proportion of persons who are vaccinated annually against seasonal influenza	70.0%
IVP-39.1 Reduce physical violence by current or former intimate partners (developmental).	-	IVP-D04 Reduce intimate partner violence (i.e., contact sexual violence, physical violence, and stalking) across the lifespan	*
IVP-39.2 Reduce sexual violence by current or former intimate partners (developmental).	-	IVP-D04 Reduce intimate partner violence (i.e., contact sexual violence, physical violence, and stalking) across the lifespan	*
IVP-39.3 Reduce psychological abuse by current or former intimate partners (developmental).	-	IVP-D04 Reduce intimate partner violence (i.e., contact sexual violence, physical violence, and stalking) across the lifespan	*
MICH-8.1 Reduce low birth weight births (< 2,500 g).	7.8%	N/A-Removed	
MICH-8.2 Reduce very low birth weight births (< 1,500 g).	1.2%	N/A-Removed	
MICH-9.1 Reduce overall preterm births.	9.4%	MICH-07 Reduce preterm births	9.4%
MICH-9.2 Reduce live births at 34 to 36 weeks of gestation.	6.8%	N/A-Removed	
MICH-9.3 Reduce live births at 32 to 33 weeks of gestation.	1.1%	N/A-Removed	
MICH-9.4 Reduce very preterm or live births at less than 32 weeks of gestation.	1.5%	N/A-Removed	
MICH-10.1 Increase prenatal care beginning in the first trimester.	78%	N/A-Removed	
MICH-10.2 Increase early and adequate prenatal care.	78%	MICH-08 Increase the proportion of pregnant women who receive early and adequate prenatal care	80.5%
MICH-11.1. Increase abstinence from alcohol among pregnant women.	98%	MICH-09 Increase abstinence from alcohol among pregnant women	92.2%
MICH-11.3 Increase abstinence from smoking cigarettes during pregnancy.	99%	MICH-10 Increase abstinence from cigarette smoking among pregnant women	95.7%
MICH-11.4 Increase abstinence from illicit drugs among pregnant women.	100%	MICH-11 Increase abstinence from illicit drugs among pregnant women	95.3%
MICH-16.1 Increase the proportion of women delivering a live birth who discussed preconception health with a health care worker prior to pregnancy.	27%	N/A-Removed	
MICH-16.2 Increase the proportion of women delivering a live birth who took multivitamins/folic acid daily prior to pregnancy.	33%	N/A-Removed	
MICH-16.3 Increase the proportion of women delivering a live birth who did not smoke prior to pregnancy.	88%	N/A-Removed	
MICH-16.4 Increase proportion of women delivering a live birth who did not drink alcohol prior to pregnancy	56%	N/A-Removed	

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.	58%	MICH-13 Increase the proportion of women delivering a live birth who had a healthy weight prior to pregnancy	47.1%
MICH-16.6 Increase the proportion of women delivering a live birth who used a most effective or moderately effective contraception method postpartum.	59%	N/A-Removed	
MICH-18 Reduce postpartum relapse of smoking among women who quit smoking during pregnancy	38%	N/A-Removed	
MICH-19 Increase the proportion of women giving birth who attend a postpartum care visit with a health care worker.	91%	MICH-D01 Increase the proportion of women who are screened for postpartum depression at their postpartum checkup	*
MICH-20 Increase the proportion of infants who are put to sleep on their backs.	76%	MICH-14 Increase the proportion of infants who are put to sleep on their backs	88.9%
MICH-21.1 Increase the proportion of infants who are ever breastfed.	82%	N/A-Removed	
OH-7 Increase the proportion of children, adolescents and adults who used the oral health care system in the past year.	49%	OH-08 Increase the proportion of children, adolescents, and adults who use the oral health care system	45%
SDOH-5 Proportion of children aged 0-17 years who have ever lived with a parent who has served time in jail or prison	+	SDOH-05 Reduce the proportion of children who have ever experienced a parent or guardian who has served time in jail	5.2%
TU-6 Increase smoking cessation during pregnancy	30%	TU-15 Increase smoking cessation success during pregnancy among females	24.4%

See https://health.gov/healthypeople/about/how-has-healthy-people-changed for Healthy People comparisons.

+ This measure is being tracked for informational purposes. If warranted, a target will be set during the decade.

* This objective currently has developmental status, meaning it is a high-priority public health issue that has evidence-based interventions to address it, but doesn't yet have reliable baseline data.

Demographics

The table below summarizes the demographic characteristics of the 2020 South Dakota eligible population and the participants.

Characteristics	Eligible Population N (%)	Survey % (95% CI, N)*
Total number	10,390	976
Maternal Race/Ethnicity**		
White, non-Hispanic	7,354 (70.8)	70.8 (71.0-71.4, 410)
Black, non-Hispanic	374 (3.6)	2.8 (2.3-3.6, 52)
Hispanic	633 (6.1)	6.5 (5.9-7.2, 160)
American Indian	1,390 (13.4)	12.9 (12.1-13.8, 227)
Asian/Pacific Islander	200 (1.9)	1.9 (1.4-2.5, 40)
Other/Mixed	436 (4.2)	5.0 (4.2-6.1, 87)
Hispanic Ethnicity		
Yes	633 (6.1)	6.5 (5.9-7.3, 160)
No	9,744 (93.9)	93.5 (92.7-94.1, 815)
Maternal age (years)		
Less than 20	506 (4.9)	4.5 (3.3-6.1, 58)
20 – 24	1,966 (18.9)	18.9 (16.3-21.9, 187)
25 – 34	6,489 (62.5)	63.7 (60.2-67.1, 612)
35+	1,429 (13.8)	12.8 (10.6-15.4, 119)
Maternal education		
Less than high school	1,526 (14.7)	14.6 (12.6-16.8, 197)
High school	2,617 (25.3)	24.6 (21.6-27.8, 244)
More than high school	6,214 (60.0)	60.8 (57.5-64.1, 528)
Annual Household Income		
Less than $16,000	-	20.1 (17.7-22.8, 244)
$16,001 - $40,000	-	23.9 (20.9-27.1, 237)
$40,001 - $85,000	-	32.4 (29.0-36.0, 245)
$85,001 or more	-	23.6 (20.5-27.0, 157)
Marital status at infant's birth		
Married	6,662 (64.1)	64.5 (61.3-67.6, 547)
Not married	3,726 (35.9)	35.5 (32.4-38.7, 428)
Birthweight		
Low birth weight less than 2500 g	631 (6.1)	6.4 (4.8-8.3, 60)
Birthweight greater than 2500 g	9,756 (93.9)	93.6 (91.7-95.2, 916)
Parity		
1st birth	3,490 (33.6)	34.1 (30.7-37.6, 309)
2nd or later	6,897 (66.4)	65.9 (62.4-69.3, 666)

* 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=976 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=297) differs from the n=227 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 2020.

Risk Factor/Outcome	Prevalence (95% CI)	
Unintended or mistimed pregnancy	42.2%	(38.6-45.7)
Uninsured before pregnancy	14.4%	(12.0-16.9)
Smoked 3 months before pregnancy	18.8%	(16.2-21.4)
Drank 3 months before pregnancy	65.6%	(62.4-68.8)
Used illicit drugs 3 months before pregnancy	11.8%	(9.6-13.9)
Obesity prior to pregnancy	27.8%	(24.7-31.0)
Started prenatal care after first trimester or had no prenatal care	14.4%	(12.1-16.8)
Attended fewer than 80% of prenatal visits	17.8%	(15.3-20.3)
Did not have teeth cleaned during pregnancy	58.4%	(54.9-61.9)
Suffered emotional abuse during pregnancy	4.9%	(3.5-6.3)
Had diabetes, hypertension, or depression diagnosed during pregnancy	37.4%	(34.0-40.9)
Had a cesarean section delivery	24.0%	(21.0-27.0)
Infant was low birthweight (less than 2,500 g)	6.4%	(4.6-8.1)
Infant was high birthweight (greater than 4000 g)	9.0%	(7.0-11.0)
Infant was born preterm (less than 37 weeks)	9.0%	(7.0-11.0)
Infant admitted to NICU	9.2%	(7.2-11.2)
Never breastfed their infant	10.1%	(8.1-12.1)
Infant does not sleep alone in the mother's room	52.0%	(48.3-55.6)
Baby is exposed to smoke	1.4%	(0.6-2.2)
Mother had a high ACE score (4+)	22.4%	(19.5-25.4)

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Summary of demographic factors associated with outcomes

Demographics	Maternal Race	Ethnicity	Maternal Age	Maternal Education	Marital Status	Annual Income	Region
Main Outcome Variables							
Visited health care worker before preg	X	X	X	X	X	X	
Discussed preparing for healthy pregnancy before preg.				X		X	X
Exercised 3+ days/week before preg.	X		X	X	X	X	
Intended pregnancy	X	X	X	X	X	X	X
Vitamin daily before preg.	X	X	X	X	X	X	
Healthy weight before preg.	X		X				
Gestational diabetes			X		X		
Depression before preg.	X				X	X	
Depression during preg.	X			X	X	X	
Began PNC in first trimester	X	X	X	X	X	X	X
Attended 80% or more of PNC visits	X		X	X	X	X	X
Obtained PNC as early as desired	X	X	X		X	X	
Received flu shot				X		X	
Teeth cleaned	X	X	X	X	X	X	
Emotionally abused	X		X	X	X	X	X
Smoked before preg.	X			X	X	X	X
Smoked during preg.	X	X		X	X	X	X
E-cigarettes use			X		X	X	
Smoking relapse during postpartum				X			
Infant exposed to smoke	X		X				
Alcohol use before preg.	X	X	X	X	X	X	
Alcohol use during preg.						X	
Illicit drug use before preg.	X		X	X	X	X	X
Illicit drug use during preg.	X		X	X	X	X	X
Ever breastfed	X		X	X	X	X	
Breastfeeding at 2 months postpartum	X		X	X	X	X	
Preterm birth							
Put to sleep on back				X		X	X
Sleeps on approved sleep surface	X				X		
Sleeps without soft objects	X		X	X	X	X	
Sleeps in own crib in mother's room	X	X			X		
Postpartum checkup	X	X	X	X	X	X	X
Postpartum depression	X		X	X	X	X	
High ACE score	X		X	X	X	X	
No insurance before pregnancy	X	X	X	X	X	X	
Below federal poverty level	X		X	X	X		X

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Summary of risk factors associated with outcomes

Risk Behaviors & Outcomes	Unintended or Mistimed Pregnancy	Not Insured Before Preg.	Smoke Before Preg.	Alcohol Before Preg.	Illicit Drugs Before Preg.	Maternal Obesity Before Preg.	Delayed or No PNC
Main Outcome Variables							
Visited health care worker before preg		X		X			X
Discussed preparing for healthy pregnancy before preg.		X				X	X
Exercised 3+ days/week before preg.		X	X	X	X	X	X
Intended pregnancy		X	X	X	X		X
Vitamin daily before preg.	X	X	X		X		X
Healthy weight before preg.			X				
Gestational diabetes						X	
Depression before preg.			X		X		
Depression during preg.			X		X		
Began PNC in first trimester		X		X	X		
Attended 80% or more of PNC visits			X		X		X
Obtained PNC as early as desired	X	X	X		X		X
Received flu shot		X		X			X
Teeth cleaned		X	X	X	X		X
Emotionally abused		X	X		X		
Smoked before preg.		X		X	X		
Smoked during preg.		X	X		X		
E-cigarettes use	X	X	X	X	X		
Smoking relapse during postpartum		X		X			
Alcohol use before preg.		X	X				X
Alcohol use during preg.				X			
Illicit drug use before preg.		X	X				X
Illicit drug use during preg.		X	X		X		X
Ever breastfed		X	X	X	X	X	X
Breastfeeding at 2 months postpartum		X	X	X	X		
Preterm birth		X					
Put to sleep on back							X
Sleeps on approved sleep surface			X		X		
Sleeps without soft objects			X		X		X
Sleeps in own crib in mother's room					X		
Postpartum checkup			X	X	X		X
Postpartum depression			X		X		
High ACE score		X	X		X	X	
No insurance before pregnancy			X	X	X		X
Below federal poverty level		X	X	X	X		X

Risk Behaviors & Outcomes	Attended <80% of PNC Visits	Teeth Not Cleaned During Preg.	Emotional Abuse During Preg.	Illness* During Preg.	C-Section	LBW	HBW
Main Outcome Variables							
Visited health care worker before preg	X	X	X				
Discussed preparing for healthy pregnancy before preg.	X	X		X	X		
Exercised 3+ days/week before preg.		X					
Intended pregnancy	X	X	X	X	X		
Vitamin daily before preg.	X	X	X	X			
Healthy weight before preg.				X	X		
Gestational diabetes	X				X		
Depression before preg.			X	X		X	
Depression during preg.			X				
Began PNC in first trimester	X	X		X			
Attended 80% or more of PNC visits		X	X				
Obtained PNC as early as desired	X	X	X				
Received flu shot	X	X					
Teeth cleaned	X		X			X	
Emotionally abused	X	X		X			
Smoked before preg.	X	X	X	X			
Smoked during preg.	X	X	X	X			
E-cigarettes use			X	X			
Smoking relapse during postpartum							
Alcohol use before preg.		X					
Alcohol use during preg.							
Illicit drug use before preg.	X	X	X	X			
Illicit drug use during preg.	X	X	X	X			
Ever breastfed	X	X	X				
Breastfeeding at 2 months postpartum	X	X	X	X			
Preterm birth		X		X	X	X	
Put to sleep on back	X	X	X				X
Sleeps on approved sleep surface							
Sleeps without soft objects	X	X					X
Sleeps in own crib in mother's room			X				
Postpartum checkup	X	X	X				
Postpartum depression			X	X	X		
High ACE score		X	X	X			X
No insurance before pregnancy		X	X		X		
Below federal poverty level	X	X	X				

* Diabetes, hypertension or depression

LBW = low birth weight (<2,500 g); HBW = high birth weight (>4,000 g)

Risk Behaviors & Outcomes	Preterm Birth	NICU Admission	Never Breast-Fed	Does Not Sleep Alone in Room w/Mother	Baby Exposed to Smoke	ACE Score 4+
Main Outcome Variables						
Visited health care worker before preg			X		X	
Discussed preparing for healthy pregnancy before preg.						
Exercised 3+ days/week before preg.			X		X	
Intended pregnancy			X		X	X
Vitamin daily before preg.					X	X
Healthy weight before preg.	X			X		X
Gestational diabetes	X					
Depression before preg.	X		X			X
Depression during preg.	X		X			X
Began PNC in first trimester			X			
Attended 80% or more of PNC visits			X			
Obtained PNC as early as desired						X
Received flu shot						
Teeth cleaned	X		X			X
Emotionally abused			X	X	X	X
Smoked before preg.			X		X	X
Smoked during preg.	X		X		X	X
E-cigarettes use					X	X
Smoking relapse during postpartum			X			
Alcohol use before preg.			X			
Alcohol use during preg.	X					
Illicit drug use before preg.			X	X	X	X
Illicit drug use during preg.			X		X	X
Ever breastfed				X		X
Breastfeeding at 2 months postpartum				X		X
Preterm birth		X				
Put to sleep on back						
Sleeps on approved sleep surface				X		X
Sleeps without soft objects						X
Sleeps in own crib in mother's room			X			X
Postpartum checkup					X	X
Postpartum depression		X				X
High ACE score			X	X		
No insurance before pregnancy			X			X
Below federal poverty level			X		X	X

Response rate - aggregated data only

The final numbers and response rates for SD 2020 PRAMS are given below:

	Non-Hispanic White	American Indian	Other Races	Total
Final Eligible Births on Frame#	7354	1752	1284	10,390
Final Eligible Births Sampled	558	605	515	1,678
Non-response	148	308	246	702
Completed	410	297	269	976
Mail	87	56	50	193
Phone	2	14	43	59
Online	321	227	176	724
Response Rate	73.5%	49.1%	52.6%	66.8%^

There were 10,390 eligible births (see SD 2020 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 2020 South Dakota PRAMS survey sample was derived from birth certificate data (stillbirths and fetal deaths were not included). The following exclusions were used when sampling 2020 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, 34% for American Indian race, and 41% 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 (2020). 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, a resource guide, and a brightly colored paper notifying the mother of an online option. A two-dollar incentive was sent to all participants with the first questionnaire. Mothers who completed the questionnaire received a $30 prepaid Visa. 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 for 2020 SD PRAMS was 66.8%.

Sampling and weighting procedures

Samples of eligible women were drawn monthly beginning in April, 2020 and ending in April, 2021. 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 2020, 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 2020 birth file was provided to CDC for comparison to the sampling frame to produce non-coverage weights. In 2020, 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

1. Kotelchuck, M. Overview of Adequacy of Prenatal Care Utilization Index. Available at: www.mchlibrary.info/databases/HSNRCPDFs/Overview_APCUIndex.pdf . Accessed on April 10, 2019.
2. National Institutes of Heart, Lung, and Blood Institute, National Institutes of Health. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report. Available at: https://www.nhlbi.nih.gov/files/docs/guidelines/ob_gdlns.pdf. Accessed on April 10, 2019.
3. Centers for Disease Control and Prevention. Defining Childhood Obesity. Available at: https://www.cdc.gov/obesity/childhood/defining.html. Accessed on April 10, 2019.