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## Rural Life Census Data Center Newsletter: Prenatal Care, Smoking During Pregnancy, and Birth Outcomes in South Dakota

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College of Agriculture and Biological Sciences

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## RURAL LIFE CENSUS DATA CENTER NEWSLETTER



# Prenatal Care, Smoking During Pregnancy, and Birth Outcomes in South Dakota

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## INTRODUCTION

The birth of a baby can be a momentous occasion, but when an infant is born prematurely and/or with low birth weight, it can place a considerable amount of financial and emotional strain on families. In addition, poor birth outcomes such as low birth weight and preterm births put financial pressure on state and federal budgets. More specifically, Cassandra O'Neill (2004) reports that Medicaid covers "40 percent of the four million annual births" nationwide. O'Neill adds that Medicaid "pays for 50 percent of hospital stays for premature and low birth weight infants."

There are a number of maternal characteristics that affect mothers' health status and birth outcomes. In this newsletter, we focus on prenatal care, smoking during pregnancy, and birth outcomes. The medical community has identified both prenatal care and smoking during pregnancy as factors that affect birth outcomes and infant health (Mathews 2001; O'Neill 2004).

## PRENATAL CARE

Prenatal care has long been recognized as being vital for maternal and infant good health (Liu 1999). Prenatal care not only helps medical professionals monitor maternal and infant health, it also often provides an avenue for the provision of integral educational and medical attention to prospective mothers. These efforts can help prevent, or at least minimize, adverse health outcomes (Alexander and Korenbrot 1995). Furthermore, timely checkups can help guide necessary medical interventions to minimize pregnancy complications. Studies demonstrating the numerous benefits of prenatal care have led to considerable support for increasing levels of access to prenatal care throughout the United States (Kogan et al. 1998).

In South Dakota the utilization of prenatal care has slightly increased from 78.1 percent in 1990 to

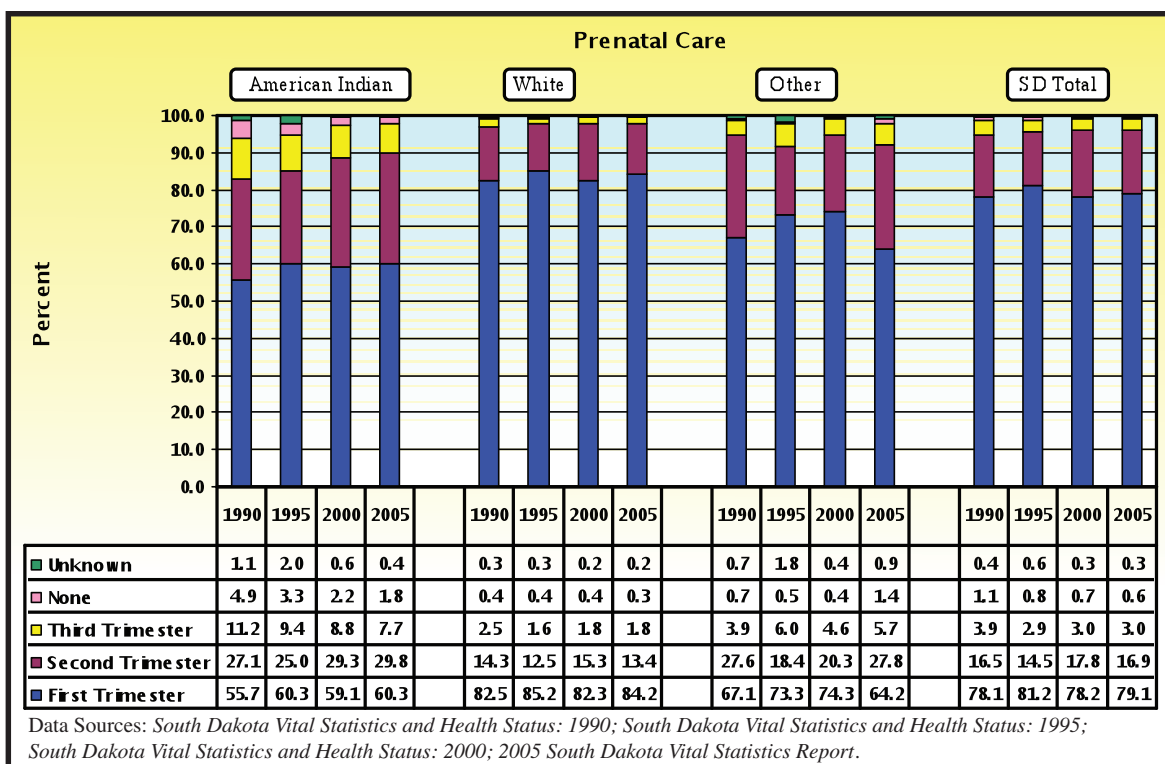
79.1 percent in 2005 (fig. 1). The utilization of prenatal care during the first trimester was highest among white women, followed by women self-identifying as "other races" and American Indian women<sup>1</sup> (fig. 1). Although there was an increase in the utilization of prenatal care among American Indian women from 1990 to 2005, we still notice that the use of prenatal care is relatively low among American Indian women when compared with whites. There was a slight increase in the utilization of first trimester prenatal care for white and American Indian women from 2000 to 2005, but there was also a very small decline in the utilization of prenatal care among women of other races during the first trimester.

## SMOKING DURING PREGNANCY

Studies have shown that smoking during pregnancy has a negative impact on mothers' and infants' health (Adams et al. 2002). Smoking during pregnancy not only causes adverse health outcomes for the pregnant woman and her unborn child, it also brings additional overall health care costs (Melvin et al. 2004). For example, babies born to women who smoke during pregnancy are more likely to be born prematurely, have low birth weight, and die of Sudden Infant Death Syndrome (SIDS) compared with infants born to mothers who do not smoke (National Centers for Disease Control and Prevention 2009). These negative health outcomes and costs associated with maternal smoking can best be avoided by introducing smoking cessation programs during and after pregnancy (Ayadi et al. 2006).

South Dakota has seen a statewide decline in smoking during pregnancy from 22.4 percent in 1990 to 17.8

<sup>1</sup>A detailed description of the South Dakota Department of Health's racial classification system can be found on page 221 of their publication entitled *2005 South Dakota Vital Statistics Report: A State and County Comparison of Leading Health Indicators*.



**Figure 1.** Prenatal care by race in South Dakota (1990–2005)

percent in 2005 (fig. 2). Smoking during pregnancy is highest among American Indian women, followed by whites and women of other races. While the percentage of white women smoking during pregnancy decreased only slightly from 1999 to 2005, there was a more pronounced decline in the percentage of American Indian women who smoked during pregnancy over this same time period. Despite the decline in smoking among American Indian women over the past decade, their percentage remains high in relation to other groups.

### LOW BIRTH WEIGHT (LBW)

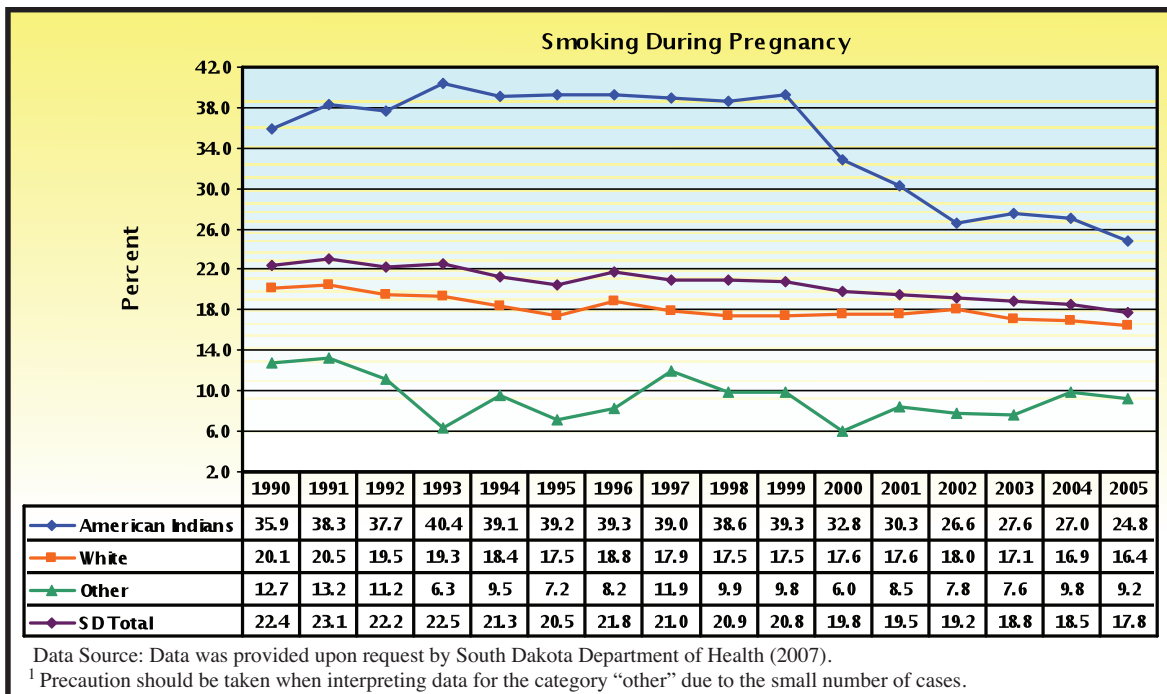
An infant's weight at birth is one important predictor of infant health and survival during the first year of life (March of Dimes 2009a). Low birth weight is defined as an infant being less than five pounds, eight ounces (March of Dimes 2009a). Smoking during pregnancy has been identified as the most significant factor contributing to low birth weights (Almond et al. 2005; Kramer 1987). A few of the other risk factors for low birth weight include mothers having lower socioeconomic status, using alcohol and/or drugs, and having inadequate nutrition (March of Dimes 2009a). Babies born with low birth weight face several health risks and can represent severe economic burdens on families (Almond et al. 2005).

All racial categories had an increase in the percentage of infants having low birth weight from 1990 to 2005, but we only see minimal differences between white and American Indian women (fig. 3). Overall, low birth weight percentage increased in South Dakota

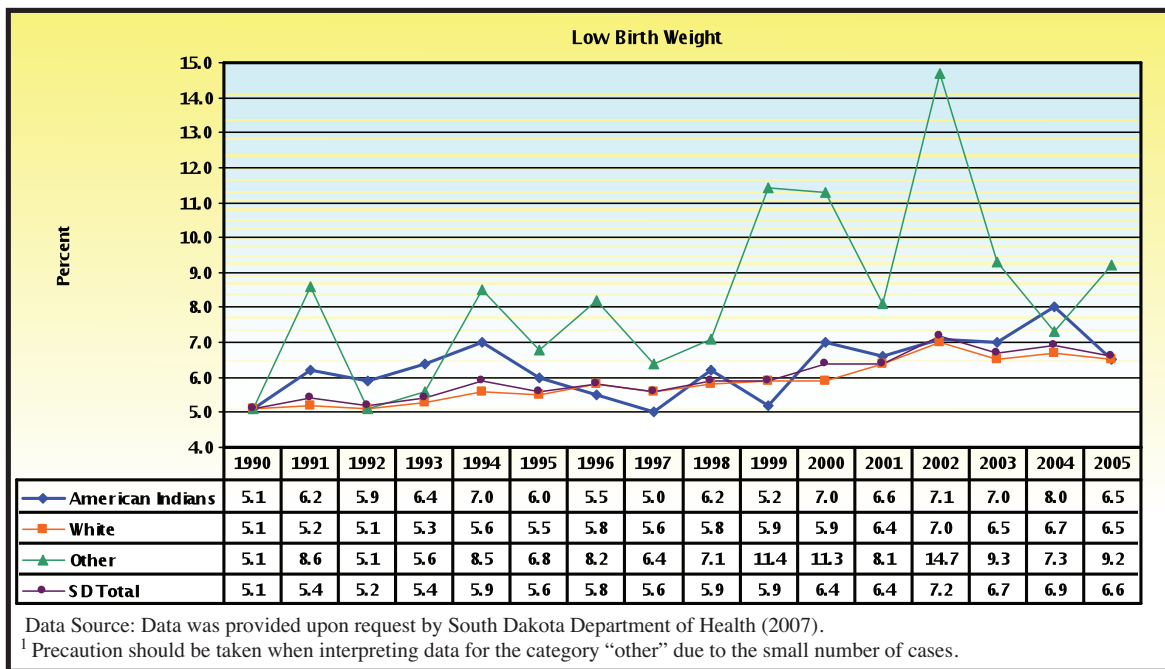
from 5.1 percent in 1990 to 6.6 percent in 2005 (fig. 3). It should be noted that there are two patterns that should be of interest to policymakers and health practitioners. First, white rates of low birth weight births have been steadily increasing. What is more striking is the more marked increase in low birth weight births of American Indians from one of the lowest points in 1999 to 2005. Some of the increased incidence in low birth weight may be due to improved detection and diagnoses using modern medical technologies that facilitate the survival of infants who previously would not have had a good chance of survival (Schempf et al. 2007). Still, an increase in the rate of low birth weight babies is of concern because such babies often face lifelong health risks and a higher risk of dying within the first year.

### PRETERM BIRTH

Preterm birth is defined as birth that occurs before 37 weeks of gestation have been completed (March of Dimes 2009b). In the United States, the rate of premature births has increased by 36 percent since the early 1980s. In the United States in 2006, the percentage of premature births was approximately 12.8 percent (Martin et al. 2009). Preterm birth is of considerable concern in the United States because it has been identified as one of the leading causes of infant mortality (March of Dimes 1999). Additionally, there are severe health risks associated with babies who are born prematurely (March of Dimes 2009b). The March of Dimes (2008a) states that infants who are born prematurely are 15 times



**Figure 2.** Percentage of mothers by race smoking during pregnancy in South Dakota (1990–2005)

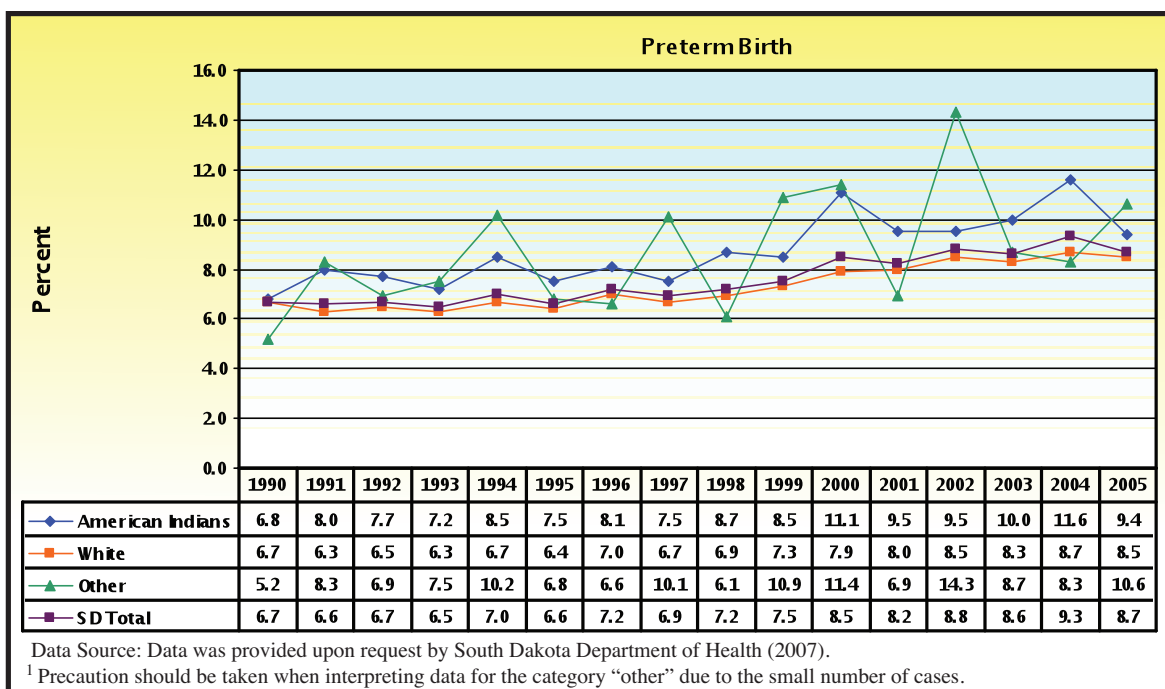


**Figure 3.** Percentage of low birth weight births by race in South Dakota (1990–2005)

more likely to die during their first year of life compared with babies who are not born prematurely. In addition to health risks, the cost associated with the treatment and interventions related to preterm births are high. For example, the March of Dimes (2008b) reported that Institute of Medicine data indicate that the total cost associated with preterm births in 2006 was \$26.2 billion.

As was the case nationally, preterm births in South

Dakota increased from 6.7 percent in 1990 to 8.7 percent in 2005 (fig. 4). Preterm births occur at relatively comparable percentages for women in all racial categories (fig. 4). One also notices in figure 4 that the percentage of preterm births increased for both American Indians and Whites from 1990 to 2005.



**Figure 4.** Percentage of preterm births by race in South Dakota (1990–2005)

## POLICY IMPLICATIONS

It is important to continually update policymakers and the public on local patterns of low birth weight and preterm births and the likely relationship between these types of births and specific conditions. One of these conditions is the extent of access to prenatal care. The public needs to be routinely informed about the benefits of effective prenatal care and the detrimental effects of its absence on maternal and infant health. Similarly, statewide educational programs concerning the negative impact of smoking during pregnancy might help to minimize adverse health outcomes of infants. Statewide campaigns and educational efforts have the potential to be effective tools in informing the general public about dangers associated with certain lifestyle behaviors. Culturally sensitive campaigns that are modified to address local conditions are also vital.

Studies examining the relationship between maternal behaviors and birth outcomes should be a priority because they lay the foundation for effective programs and policies. It is critical that accurate data on the overall health of mother and infant be frequently collected and analyzed. Access to prenatal care increases the likelihood of high-quality monitoring of the health of the mother and the developmental process of an unborn infant. Such practices can help reduce pregnancy complications and reduce poor birth outcomes.

Since poor birth outcomes have long-term consequences for families as well as for the state and nation, it is important that we develop outreach and support strategies for women of diverse cultural and socioeco-

omic backgrounds. For example, launching community and statewide educational programs concerning tobacco cessation could curb such behavior and limit adverse effects associated with smoking. In addition, prenatal care, including accessible maternal programs about healthy eating behaviors, might help to better serve the needs of pregnant women and their babies.

## CONCLUSION

Limited access to prenatal care is one of several factors contributing to negative birth outcomes. Data show that over 20 percent of South Dakota's pregnant women do not receive prenatal care. Thus it is important to improve the degree to which such care is made available. The incorporation of educational, medical, and nutritional information into prenatal care programs can help professionals monitor, and possibly improve, the health of pregnant women and infants and limit pregnancy complications and adverse effects.

Additionally, because maternal behavior is directly linked to infants' health outcomes, it is important to promote awareness of healthy lifestyle choices among pregnant women. Numerous factors influence the health of pregnant mothers and infants. For instance, several empirical studies have demonstrated the association between smoking during pregnancy and negative birth outcomes. Hence, it is incumbent that social welfare and health practitioners promote smoking cessation programs among pregnant women during and after pregnancy.

If you would like more information about population trends, such as pregnancy trends, in South Dakota,



contact Jacob Cummings or Mike McCurry at the Rural Life and Census Data Center. The Center's e-mail address is [sdsudata@sdstate.edu](mailto:sdsudata@sdstate.edu), and the Center phone number is (605) 688-4899. You can also learn more by looking at our website at <http://sdrurallife.sdstate.edu/>.

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**Appendix 1.** Percentage<sup>1</sup> utilization of prenatal care in South Dakota counties by year

County	1995	1996	1997	1998	1999	2000	2001	2002	2003
Aurora	84	90	91	89	89	88	85	85	84
Beadle	82	90	82	79	77	76	79	77	76
Bennett	66	67	66	64	61	58	53	52	52
Bon Homme	83	85	88	87	89	90	90	90	87
Brookings	90	89	89	88	87	87	87	87	87
Brown	78	77	77	77	77	78	79	82	84
Brule	79	82	82	82	79	78	77	75	76
Buffalo	75	75	74	70	61	56	54	53	49
Butte	83	85	84	84	84	84	83	82	80
Campbell	86	81	84	88	86	85	87	88	84
Charles Mix	72	73	73	75	76	74	72	68	67
Clark	74	74	75	73	72	70	68	66	68
Clay	89	89	89	89	88	86	85	84	85
Codington	88	89	90	90	89	89	88	88	88
Corson	68	73	77	72	69	67	62	59	60
Custer	76	77	77	77	78	77	78	77	80
Davison	88	91	91	92	90	89	88	86	85
Day	69	70	71	73	75	77	80	81	80
Deuel	82	85	85	86	89	88	90	88	87
Dewey	79	77	76	74	72	69	67	63	65
Douglas	80	84	85	82	81	82	81	77	79
Edmunds	77	78	79	78	77	79	77	76	77
Fall River	67	72	72	71	71	72	71	71	76
Faulk	57	59	63	59	65	63	62	60	65
Grant	84	85	85	85	84	85	83	83	81
Gregory	82	81	81	84	81	78	76	76	75
Haakon	78	81	79	79	78	83	79	80	81
Hamlin	83	82	86	86	86	84	83	83	83
Hand,	77	78	77	76	75	80	80	78	82
Hanson,	72	76	78	81	79	79	77	76	75
Harding	74	75	75	78	79	77	77	79	75
Hughes	88	88	88	86	85	83	81	80	79
Hutchinson	77	79	83	84	83	80	79	75	74
Hyde	85	88	88	88	86	85	85	80	77
Jackson	69	68	70	67	69	70	74	69	71
Jerauld,	79	79	79	76	73	77	74	71	72
Jones	89	85	85	84	80	81	84	78	83
Kingsbury	85	87	87	84	84	83	82	81	84
Lake	85	85	86	85	85	85	84	83	85
Lawrence	88	88	88	88	86	85	85	82	82

Source: Annie Casey Foundation

<sup>1</sup> The percent of live single births to women receiving prenatal care during the first trimester (first three months) of pregnancy, by county of residence.

Note: years represent 5-year intervals, 1995 = 1993–97; 1996 = 1994–98; 1997 = 1995–99; 1998 = 1996–00; 1999 = 1997–01; 2000 = 1998–02; 2001 = 1999–03; 2002 = 2000–04; 2003 = 2001–05.

**Appendix 1. (continued)**

County	1995	1996	1997	1998	1999	2000	2001	2002	2003
Lincoln	91	92	91	92	90	88	88	87	87
Lyman	75	78	78	74	71	72	70	71	72
McCook	83	85	86	87	87	84	82	81	81
McPherson	64	66	66	66	70	74	78	80	81
Marshall	66	67	74	73	73	75	74	71	70
Meade	82	83	83	83	84	83	82	80	81
Mellette	76	75	72	71	72	67	64	66	65
Miner	81	80	80	82	82	81	82	84	83
Minnehaha	88	88	87	86	84	82	81	79	78
Moody	88	90	89	85	82	80	78	76	76
Pennington	77	79	79	78	79	80	79	78	80
Perkins	81	80	82	79	75	73	70	69	72
Potter	87	89	91	91	85	86	86	83	82
Roberts	62	66	67	67	67	66	64	63	62
Sanborn	75	77	78	76	76	78	75	77	76
Shannon	65	63	63	63	64	63	63	61	61
Spink	76	75	75	74	72	72	74	75	76
Stanley	87	86	85	80	83	80	81	82	83
Sully	86	87	88	91	90	91	91	88	86
Todd	62	59	59	60	59	58	56	55	54
Tripp	80	82	83	84	86	85	84	82	79
Turner	91	89	88	86	83	80	81	79	81
Union	90	92	93	93	92	93	92	92	93
Walworth	78	77	77	76	77	75	75	75	75
Yankton	88	90	91	90	90	89	88	87	88
Ziebach	65	66	62	62	60	61	59	59	60

Source: Annie Casey Foundation

<sup>1</sup> The percent of live single births to women receiving prenatal care during the first trimester (first three months) of pregnancy, by county of residence.

Note: years represent 5-year intervals, 1995 = 1993–97; 1996 = 1994–98; 1997 = 1995–99; 1998 = 1996–00; 1999 = 1997–01; 2000 = 1998–02; 2001 = 1999–03; 2002 = 2000–04; 2003 = 2001–05.



**Appendix 2.** South Dakota smoking during pregnancy, low birth weight, and preterm birth percentages by race (1990–2005)

	SMOKING DURING PREGNANCY					LOW BIRTH WEIGHT					PRETERM BIRTH			
	American Indian	White	Other	South Dakota Total		American Indian	White	Other	South Dakota Total		American Indian	White	Other	South Dakota Total
1990	35.9	20.1	12.7	22.4		5.1	5.1	5.1	5.1		6.8	6.7	5.2	6.7
1991	38.3	20.5	13.2	23.1		6.2	5.2	8.6	5.4		8.0	6.3	8.3	6.6
1992	37.7	19.5	11.2	22.2		5.9	5.1	5.1	5.2		7.7	6.5	6.9	6.7
1993	40.4	19.3	6.3	22.5		6.4	5.3	5.6	5.4		7.2	6.3	7.5	6.5
1994	39.1	18.4	9.5	21.3		7	5.6	8.5	5.9		8.5	6.7	10.2	7.0
1995	39.2	17.5	7.2	20.5		6	5.5	6.8	5.6		7.5	6.4	6.8	6.6
1996	39.3	18.8	8.2	21.8		5.5	5.8	8.2	5.8		8.1	7.0	6.6	7.2
1997	39	17.9	11.9	21		5	5.6	6.4	5.6		7.5	6.7	10.1	6.9
1998	38.6	17.5	9.9	20.9		6.2	5.8	7.1	5.9		8.7	6.9	6.1	7.2
1999	39.3	17.5	9.8	20.8		5.2	5.9	11.4	5.9		8.5	7.3	10.9	7.5
2000	32.8	17.6	6	19.8		7	5.9	11.3	6.4		11.1	7.9	11.4	8.5
2001	30.3	17.6	8.5	19.5		6.6	6.4	8.1	6.4		9.5	8.0	6.9	8.2
2002	26.6	18	7.8	19.2		7.1	7	14.7	7.2		9.5	8.5	14.3	8.8
2003	27.6	17.1	7.6	18.8		7	6.5	9.3	6.7		10.0	8.3	8.7	8.6
2004	27	16.9	9.8	18.5		8	6.7	7.3	6.9		11.6	8.7	8.3	9.3
2005	24.8	16.4	9.2	17.8		6.5	6.5	9.2	6.6		9.4	8.5	10.6	8.7

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