

## Smoking during pregnancy in the 1990s

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### Abstract

**Objectives**—This report presents trends and variations in smoking during pregnancy in the United States. Data are presented for various characteristics including mother's age, race, ethnic origin, place of birth and State of residence, live birth order, and birthweight.

**Methods**—Descriptive tabulations of data reported on the birth certificates are presented.

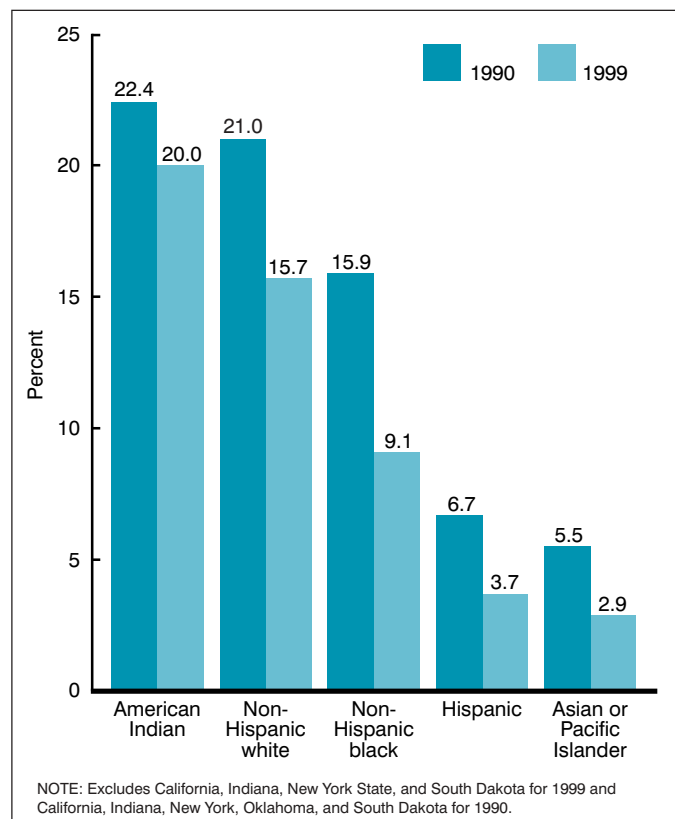
**Results**—The percentage of women who smoked during pregnancy declined every year from 1990 through 1999. In 1999, 12.3 percent of women giving birth reported smoking during pregnancy. For women 15 to 19 years of age, the rate of smoking during pregnancy declined between 1990 and 1994 but has increased since then and teenagers now have the highest rate of all age groups. Maternal smoking rates also declined for all race and ethnic groups in the 1990s, but important differences persist. American Indian, non-Hispanic white, and Hawaiian women had the highest rates of smoking during pregnancy in 1999 while, Chinese and Central and South American women had the lowest smoking rates.

**Keywords:** smoking • pregnancy • women • birth certificate • teenagers

### Introduction

Recently published data from the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS) reported another decline in smoking rates during pregnancy based on birth certificate data for 1999 (1). Overall, maternal smoking has declined nearly one-third in the 1990s. Smoking during pregnancy is associated with adverse outcomes, including low birthweight, intrauterine growth retardation, and infant mortality, as well as negative consequences for child health and development (2–6). Estimates of smoking attributable costs of complicated births range from 1.4 to 2 billion dollars annually (7). This report shows trend data for the 1990s by mother's age, State, race, Hispanic origin, place of birth, and other specified characteristics, as well as variations in smoking among population groups for 1999.

During the 1990s the number of States that collected comparable data on smoking during pregnancy from the birth certificate changed.



**Figure 1. Percent of mothers who smoked during pregnancy by race and Hispanic origin: Selected reporting area, 1990 and 1999**

### Acknowledgments

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California and South Dakota were nonreporting States for the entire decade. Oklahoma and New York City started reporting in 1991 and 1994, respectively. Data for Indiana and New York State are available beginning in 1999. The 1990 data on smoking during pregnancy are based on 75 percent of all live births. The reporting area included 79–81 percent of all births in 1994–98 and increased to 87 percent in 1999. When maternal smoking trends are compared for a constant reporting area (46 States, the District of Columbia, and New York City), the smoking rate declined from 14.6 percent in 1994 to 12.3 percent in 1999. With the inclusion of Indiana and New York State in the reporting area, the overall smoking rate for 1999 was 12.6 percent. Thus, changes in the reporting areas over the decade would have some effect on the overall trends, particularly the addition of Indiana and New York State in 1999, which tended to alter the trends the most for smoking among women under 25 years of age. Smoking rates in 1999 were elevated because of the relatively high rate for Indiana in particular.

Because the recent change in the reporting area had a definite effect on the trends, the trend analysis in this report is based on the area excluding California, Indiana, New York State, and South Dakota. Sections showing data by State and maternal and infant health characteristics according to smoking status for 1999 only are based on the complete reporting area (without California and South Dakota).

The smoking data for Asian or Pacific Islander (API) and Hispanic women were based on smaller percentages of births throughout the 1990s compared with other race and ethnic groups, primarily due to the lack of data for California. In 1999, data for API and Hispanic women were based on 68 and 67 percent of U.S. births, respectively (all States excluding California and South Dakota). The addition of Indiana and New York State had little impact on the coverage for these groups, or on the reporting of their maternal smoking rates. Although the data for these groups are less representative, the relatively low smoking rates for Hispanic and API women have been corroborated in other studies (8–10). (See section on “Data limitations.”)

### Teenagers now have the highest rates of smoking during pregnancy

Declines in smoking rates were observed for all age groups of mothers 15 years of age and older over the decade. From 1990 to 1995 smoking rates were highest for women 20–24 years of age, followed by teenagers. Because the rates for women in their early twenties fell more steeply than rates for teenagers, since 1996, the rate for teenagers has been the highest. The rate in 1999 was 17.5 (1).

While the smoking rate decreased for teenagers from 1990 to 1994, more recent increases have muted the overall decline that occurred between 1990 and 1999 (16 percent). The rates for 15–17- and 18–19-year-olds declined between 1998 and 1999, but are still higher than the lows reached in 1994 (table 1). The largest decline from 1990 to 1999 was found for mothers 30–34 years of age (45 percent) followed by mothers 25–29 years of age (41 percent). Mothers 20–24, 35–39, and 40–54 years of age had similar declines of 27, 26, and 23 percent, respectively. In 1990, smoking rates were lowest for the youngest (less than 15 years of age) and oldest (40–49 years of age) women. In 1999, mothers 30–34 years of age and less than 15 years of age had the lowest rates (8.4 and 7.5 percent, respectively) (table 1).

### Declines for all race/ethnic groups

Declines in smoking during pregnancy were reported for all race and Hispanic origin groups between 1990 and 1999 (table 1 and figure 1). Of all race and ethnic groups, American Indian women continue to have the highest rate of smoking during pregnancy (one in five in 1999) (figure 2); they also reported the smallest decline between 1990 and 1999 (10 percent). Smoking rates are also high for non-Hispanic white mothers, 15.7 percent in 1999; their rate declined 25 percent from 1990. Hispanic mothers and non-Hispanic black mothers had similar declines of 45 and 43 percent, respectively, to 3.7 and 9.1 percent in 1999. The rate of smoking during pregnancy for APIs, who had the lowest rate, declined by 47 percent from 5.5 percent in 1990 to 2.9 in 1999.

### Among teenage mothers non-Hispanic whites have highest rates

Among teenage mothers 15–19 years, non-Hispanic white mothers had the highest smoking rates every year in the 1990s (table 1 and figure 3). In 1999, 29.6 percent reported smoking, a rate only 8 percent lower than the 1990 rate. Smoking rates are also high for American Indian teenagers, 22.6 percent in 1999. Rates for Hispanic, non-Hispanic black, and API teenagers are much lower, ranging from 5 to 9 percent.

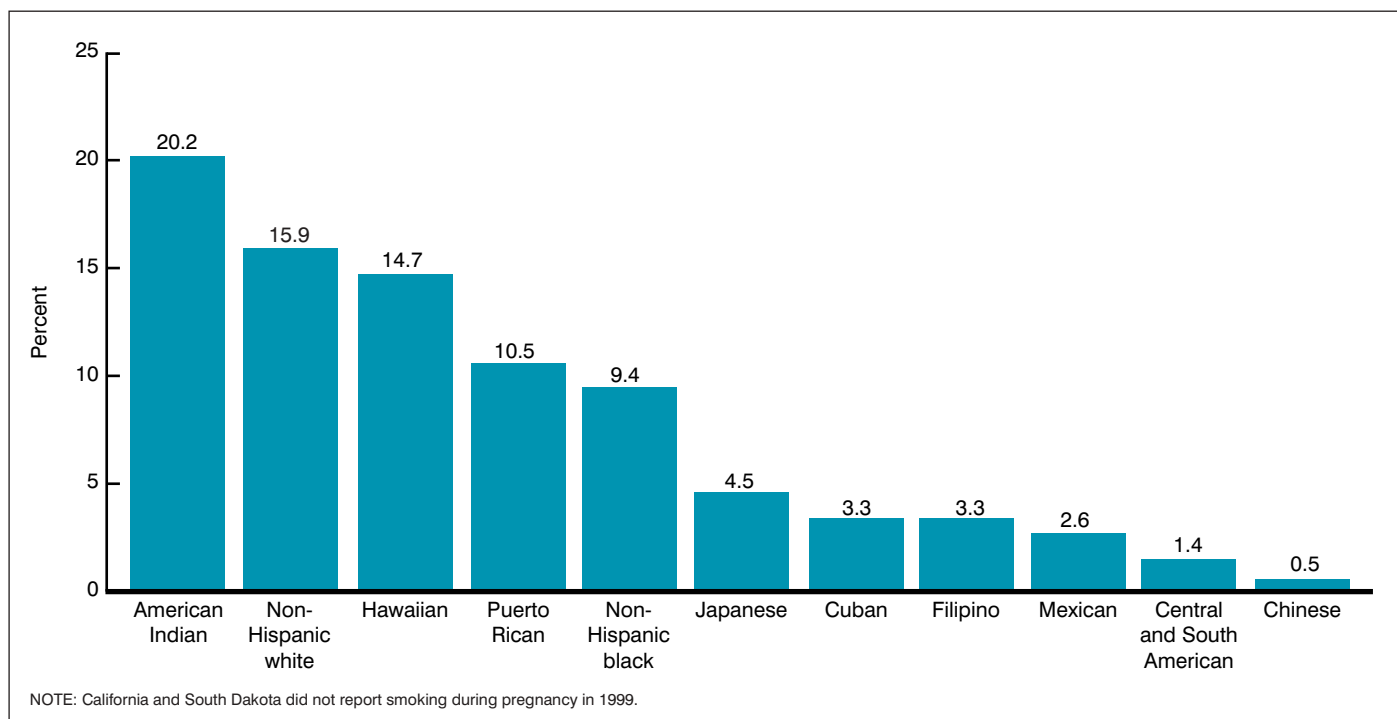
Hispanic and API teen smoking rates during pregnancy are the only ones with noticeable decreases in the decade (34 percent decrease to 4.5 percent and 19 percent decrease to 9.2 percent, respectively) (figure 4). American Indian, non-Hispanic white, and non-Hispanic black teen smoking during pregnancy rates fluctuated in the 1990s with increases in the mid to late 1990s. As a result of these shifts, smoking rates for these groups in 1999 were only modestly lower than in 1990 (9, 8, and 8 percent declines from 1990 to 1999, respectively).

### Declines for most race/ethnic groups in their twenties and older

Smoking during pregnancy generally declined between 1990 and 1999 for Hispanic, non-Hispanic white, and API women in all age groups. Smoking rates for Hispanic mothers in age groups 20–39 years of age declined by more than 40 percent. Declines for Asian or Pacific Islander mothers ranged from 19 to 64 percent by age. Non-Hispanic black women 25–34 years of age had declines over 55 percent. Smoking among American Indian mothers declined for all age groups except for women 35–39 and 40–54 years of age whose rates increased 7 and 33 percent, respectively.

Overall smoking during pregnancy rates for Hispanic mothers are low; however, rates differ considerably among Hispanic subgroups. Puerto Ricans had the highest rates of smoking during pregnancy in 1999 (10.5 percent), over 7 times higher than the rate of 1.4 percent for Central and South American women (table 2). Puerto Rican women 20–24 years of age had the highest rate at 11.9 percent of all Hispanic origin groups of any age. The age pattern for smoking during pregnancy is similar for Mexican, Puerto Rican, and Cuban women, with those 25–34 years of age reporting the lowest rates.

Among APIs, Chinese women had the lowest rates of smoking during pregnancy in 1999 and the lowest of any group by race and Hispanic origin (0.5 percent), while Hawaiian women had the highest smoking rate (14.7 percent). Among Hawaiian mothers the highest rate



**Figure 2. Percent of mothers who smoked during pregnancy by race/ethnicity of mother: Total reporting areas, 1999**

was for those 15–19 years of age (16.6 percent in 1999). The rate of smoking during pregnancy generally declined by age for Japanese, Hawaiian, and Filipino women.

### Mothers not completing high school have highest rates

Throughout the 1990s, smoking rates by maternal education were highest for women with 9–11 years of education (29.0 percent in 1999) (table 3) (1). Nearly one-half of non-Hispanic white women with 9–11 years of education smoked during pregnancy in 1999. Women with four years or more of college continue to have the lowest rates of smoking during pregnancy (2 percent, overall, in 1999). (All text and tabular data shown are for women 20 years of age and older.)

### All reporting areas show declines

The percent of women who smoked during pregnancy has declined significantly in all reporting areas except for New Mexico (table 4). Twelve States, the District of Columbia, and New York City (NYC) had declines of 35 percent or more between 1990 and 1999. (The change for NYC is measured from 1994 when this information was first reported.) The District of Columbia reported a 77-percent decline in the rate of smoking during pregnancy during this decade.

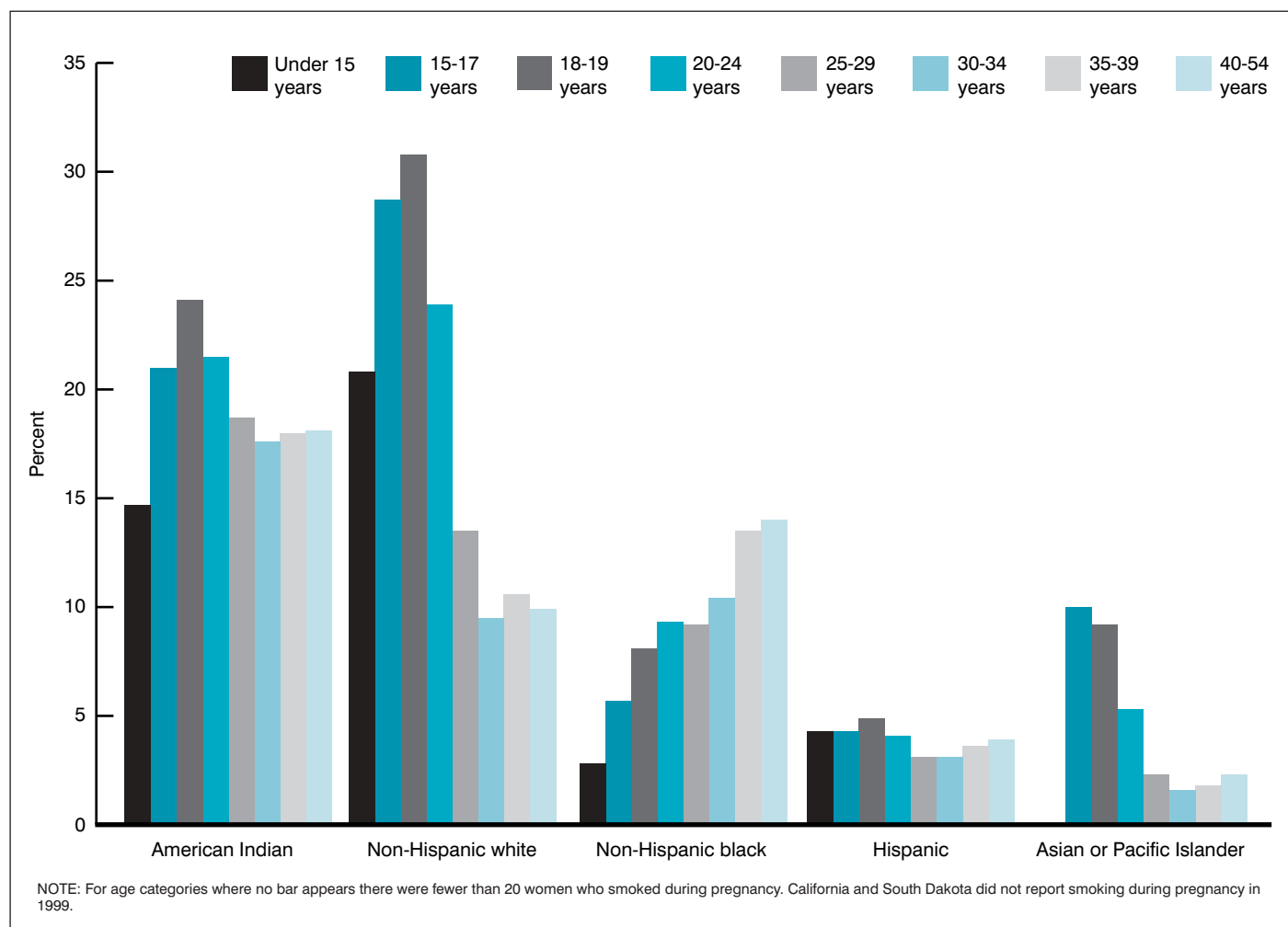
Eight States, the District of Columbia, and NYC reported smoking during pregnancy rates in 1999 that are at or below 10 percent. In four States, the percent of women who smoked during pregnancy was 20 percent or higher. West Virginia had the highest rate each year over the period; in 1999, 26.1 percent of women reported smoking during pregnancy (figure 5).

### Among teens, mothers in the District of Columbia have the lowest rate; Arizona teenage mothers had the largest decline

Table 5 presents data on smoking during pregnancy for 15–19-year olds by State for the periods 1990–91, 1995–96, and 1998–99. Rates are computed as 2-year averages to increase the stability of the State-specific data. The smoking rates for teenage mothers in all reporting States for the period 1990–91 to 1995–96 decreased 16 percent and then increased 6 percent from 1995–96 to 1998–99. While 34 States showed significant declines during the first half of the 1990s (11), only 4 (Arizona, Colorado, Massachusetts, and Oregon) had a significant decline in the second half of the 1990s (figure 6). In fact, 22 States had significant increases in the second half of the 1990s, a dramatic reversal of the positive trend in the early 1990s in teenage smoking. (No State had a significant increase between 1990–91 and 1995–96). Three States had significant increases greater than 20 percent from 1995–96 to 1998–99, Mississippi (22 percent), Hawaii (23 percent), and New Jersey (25 percent). Arizona had the second largest decline in the rate of teen women who smoked during pregnancy in the first half of the 1990s (29 percent) and the largest decline in the second half (24 percent).

### Large differences seen for some characteristics

Women were more likely to have smoked during their pregnancy in 1999 if they had higher order births, were unmarried, were born in the 50 States and the District of Columbia, had a single birth, and had late or no prenatal care (table 6).



**Figure 3. Percent of mothers who smoked during pregnancy by race, Hispanic origin, and age of mother: Total reporting areas, 1999**

Women born outside the 50 States and the District of Columbia were much less likely to smoke during pregnancy than were those born in the 50 States and the District of Columbia (2.3 and 14.6 percent, respectively). This difference, seen for all age groups, was also observed in the past (11–13). Among mothers 30 years of age and older, large differences exist between married and unmarried mothers and those who initiated prenatal care in the first trimester and those who had no care (greater than fourfold for both).

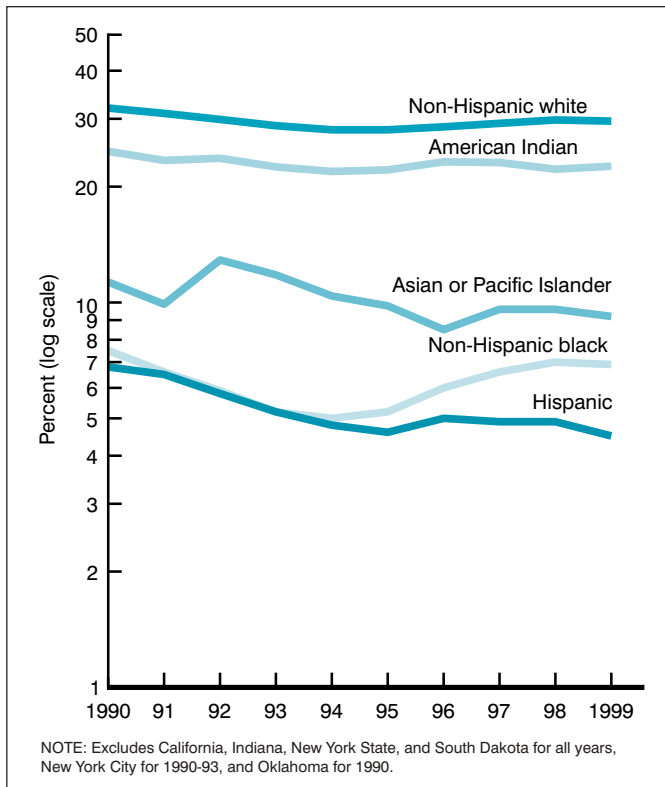
### Smokers nearly twice as likely to have a low birthweight baby

Many studies have documented the negative consequences smoking has on infant birthweight and other birth outcomes (13–17). Women who smoke during pregnancy are more likely to have an infant that weighs less than 2,500 grams (5 pounds, 8 ounces) than those who do not smoke (12.1 and 7.2 percent in 1999, respectively) (table 7). Filipino, Cuban, and Central and South American women have lower differentials between smokers and nonsmokers in low birthweight than other race/ethnic groups.

### Data limitations

Trends in smoking based on data collected on birth certificates have some important limitations. As stated earlier, the range in the percent of all birth certificates collecting comparable information about smoking status increased from 75 percent in 1990 and 79 percent in 1994 to 87 percent in 1999. The rates are not national rates nor are they based on a consistent number of States. The trend analysis in this report was based on a reporting area, including 46 States, the District of Columbia, and New York City, which comprised 81 percent of U.S. births in 1999. This was the same reporting area in effect for 1994–98.

As noted previously the lack of data for California limits the representativeness of data for Hispanic and API mothers. However, a 1992 study conducted in California corroborates low rates of smoking during pregnancy for Hispanic and API mothers (18). The addition of data from Indiana and New York State for 1999 did have an impact on the rates of smoking during pregnancy shown here. Rates by age for women under 25 tended to increase from 1998 to 1999 solely as a result of changed reporting area. If the reporting area had not changed, there would have been slight declines in the rates for these women. These effects are shown in table 8.



**Figure 4. Percent of women 15-19 years of age who smoked during pregnancy: Selected reporting areas, 1990-99**

Smoking rates based on birth certificate data and trends in maternal smoking have been shown to be consistent with data from other sources in some studies (8), while others suggest that data from birth certificates underestimate smoking rates during pregnancy (10, 19, 20). The question on the birth certificate lacks specific time referents. The information collected may come from prenatal records or from the mother herself after the delivery. One study examined alternative ways of asking about mother's smoking behavior during pregnancy on the birth certificate (21, 22). It concluded that information about smoking before and during pregnancy is needed to fully describe smoking behavior related to pregnancy.

Birth certificates are unable to measure the accuracy and truthfulness of mothers' reports of their smoking behavior. For example, in cases of poor birth outcome, the mother might be less willing to admit having smoked at all during her pregnancy if asked about lifestyle factors after the delivery.

## Conclusions

Public health education efforts to inform people in the United States about the dangers and costs of smoking appear to have helped reduce smoking rates. The efforts to reduce overall smoking in the United States combined with those in individual States and those focused directly on pregnant women have evidently helped to reduce rates of smoking during pregnancy (23). There is evidence from other analyses that a woman's knowledge that she is pregnant does cause some women to quit smoking (24). Unfortunately, women who quit smoking during pregnancy are likely to resume smoking within 1 year after delivery (25). The low rates of smoking during

pregnancy for Japanese, Cuban, Filipino, Mexican, Central and South American, and particularly Chinese women (all less than 5 percent) provide an excellent point of reference for women whose rates are much higher (Puerto Rican, Hawaiian, non-Hispanic white, and American Indian—all greater than 10 percent). The reversal in smoking rates during pregnancy for teen mothers in the second half of the 1990s and continued high overall rates for American Indian mothers indicate the need for additional education directed toward these populations.

The risks and costs of smoking during pregnancy are high. Some recent research suggests that waiting to prevent smoking during pregnancy until prenatal care is initiated is too late (26). Tobacco use in early pregnancy can cause fetal harm before a woman knows that she is pregnant. This research suggests that effective interventions throughout the life course would be a prudent step towards lowering rates of smoking during pregnancy. In fiscal year 2001 nearly \$900 million will be invested by 45 States towards tobacco control and prevention programs (27). To reduce smoking during pregnancy will require continuous interventions directed towards women who are currently smoking during pregnancy and also for women who will be pregnant in the future.

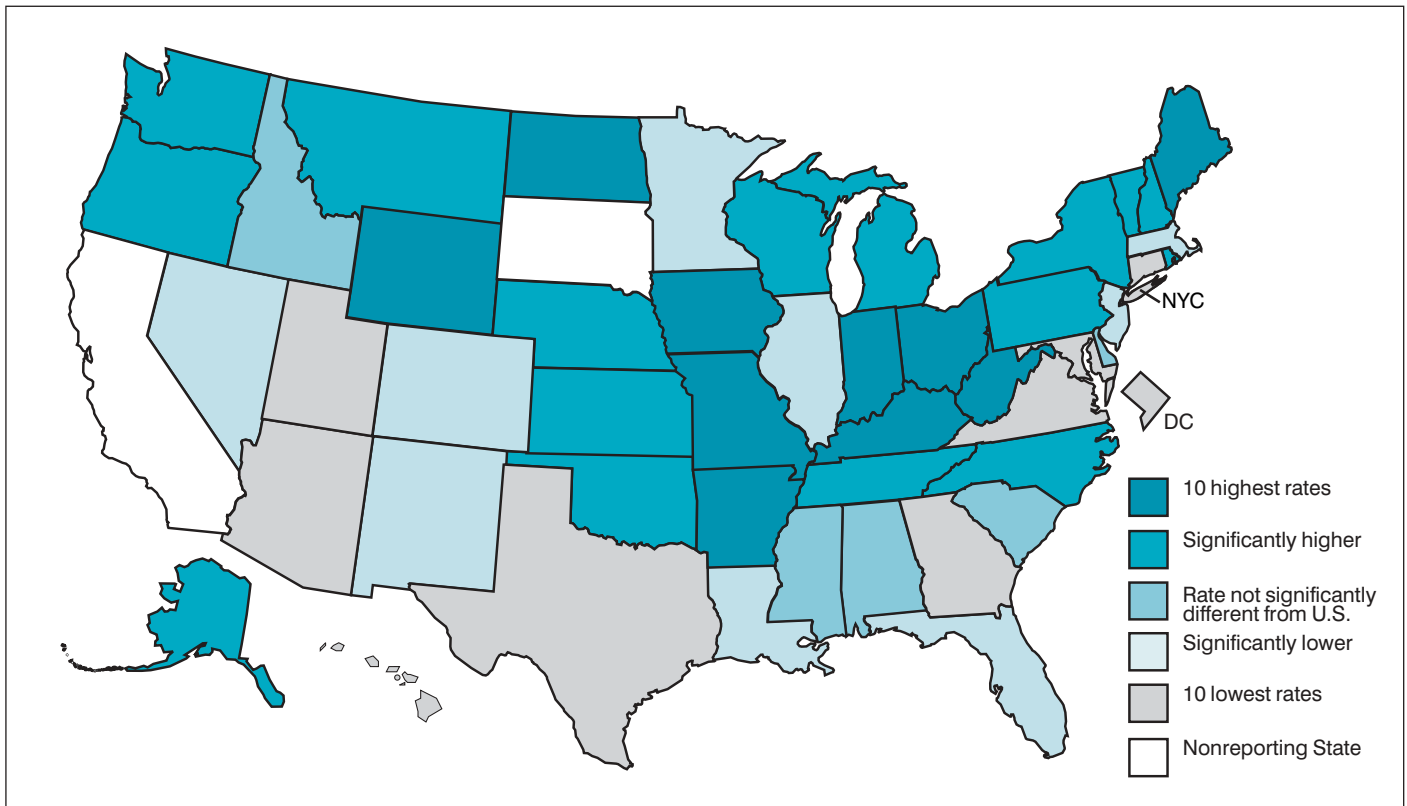


Figure 5. Percent of women who smoked during pregnancy by State: 1999

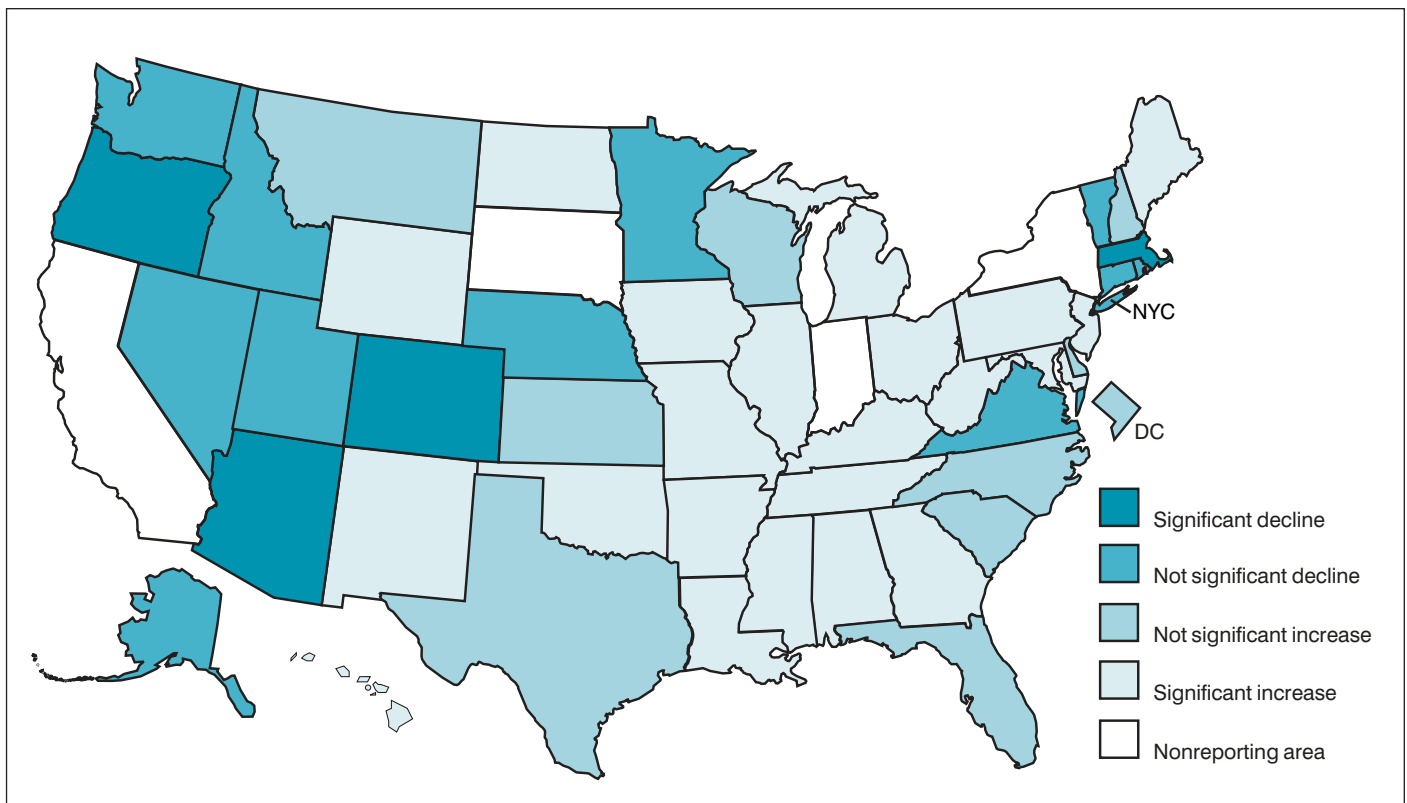


Figure 6. Change in percent of women 15-19 years of age who smoked during pregnancy by State, from 1995-96 to 1998-99

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**Table 1. Percent of women who smoked during pregnancy by race/ethnicity and age of mother and percent change between 1990 and 1999: Specified reporting areas, 1990–99**

Race/ethnicity	Total	Age of mother								
		Less than 15 years	15–19 years			20–24 years	25–29 years	30–34 years	35–39 years	40–54 years <sup>1</sup>
			Total	15–17 years	18–19 years					
<b>Total<sup>2</sup></b>										
1999 <sup>3</sup>	12.3	7.5	17.5	15.0	18.9	16.2	10.7	8.4	9.8	9.5
1998 <sup>3</sup>	12.9	7.7	17.8	15.5	19.2	16.5	11.4	9.3	10.6	10.0
1997 <sup>3</sup>	13.2	8.1	17.6	15.5	18.8	16.6	11.8	10.0	11.1	10.1
1996 <sup>3</sup>	13.6	7.7	17.2	15.4	18.3	16.8	12.3	10.9	11.7	10.1
1995 <sup>3</sup>	13.9	7.3	16.8	14.6	18.1	17.1	12.8	11.4	12.0	10.1
1994 <sup>3</sup>	14.6	6.7	16.7	14.4	18.1	17.8	13.5	12.3	12.2	10.3
1993 <sup>4</sup>	15.8	7.0	17.5	14.8	19.1	19.2	14.8	13.4	12.8	11.0
1992 <sup>4</sup>	16.9	6.9	18.5	15.6	20.3	20.3	16.1	14.5	13.4	11.5
1991 <sup>4</sup>	17.7	7.5	19.7	16.6	21.5	21.1	17.1	15.1	13.3	11.9
1990 <sup>5</sup>	18.4	7.5	20.8	17.6	22.5	22.1	18.0	15.3	13.3	12.3
Percent change 1990–99	–33	0	–16	–15	–16	–27	–41	–45	–26	–23
<b>Hispanic</b>										
1999 <sup>3</sup>	3.7	4.3	4.5	4.2	4.7	4.1	3.1	3.1	3.6	3.9
1998 <sup>3</sup>	4.0	4.1	4.9	4.6	5.1	4.2	3.3	3.4	4.2	4.4
1997 <sup>3</sup>	4.1	4.2	4.9	4.8	5.0	4.2	3.6	3.7	4.6	4.2
1996 <sup>3</sup>	4.3	3.4	5.0	5.0	5.0	4.3	3.9	4.2	4.9	4.8
1995 <sup>3</sup>	4.3	3.3	4.6	4.5	4.8	4.5	3.8	4.2	5.0	4.0
1994 <sup>3</sup>	4.6	3.1	4.8	4.5	4.9	4.7	4.2	4.6	5.0	4.3
1993 <sup>4</sup>	5.0	4.1	5.2	5.1	5.4	5.2	4.7	5.0	5.1	4.4
1992 <sup>4</sup>	5.8	3.4	5.8	5.3	6.1	6.1	5.5	5.7	5.7	5.0
1991 <sup>4</sup>	6.3	4.4	6.5	6.1	6.7	6.6	6.1	6.4	5.9	5.6
1990 <sup>5</sup>	6.7	4.4	6.8	6.4	7.1	6.9	6.7	6.7	6.0	5.2
Percent change 1990–99	–45	–2	–34	–34	–34	–41	–54	–54	–40	–25
<b>Non-Hispanic white</b>										
1999 <sup>3</sup>	15.7	20.3	29.6	28.3	30.2	23.4	13.2	9.4	10.6	9.9
1998 <sup>3</sup>	16.2	21.4	29.8	28.6	30.3	23.5	13.9	10.2	11.2	10.5
1997 <sup>3</sup>	16.5	22.4	29.2	28.5	29.6	23.7	14.1	10.8	11.6	10.5
1996 <sup>3</sup>	16.9	21.5	28.6	28.2	28.8	23.8	14.5	11.7	12.2	10.5
1995 <sup>3</sup>	17.1	21.5	28.1	27.3	28.6	23.9	14.8	12.0	12.4	10.6
1994 <sup>3</sup>	17.7	21.1	28.1	27.2	28.6	24.4	15.3	12.8	12.3	10.5
1993 <sup>4</sup>	18.6	20.3	28.8	27.4	29.6	25.5	16.2	13.6	12.8	11.2
1992 <sup>4</sup>	19.7	20.9	29.9	28.3	30.7	26.2	17.4	14.7	13.5	12.1
1991 <sup>4</sup>	20.5	22.4	31.0	29.2	31.9	26.8	18.3	15.3	13.4	12.4
1990 <sup>5</sup>	21.0	22.8	32.0	30.9	32.5	27.3	19.0	15.3	13.4	12.9
Percent change 1990–99	–25	–11	–8	–8	–7	–14	–31	–39	–21	–23
<b>Non-Hispanic black</b>										
1999 <sup>3</sup>	9.1	2.7	6.9	5.5	7.8	9.0	8.9	10.1	13.3	13.6
1998 <sup>3</sup>	9.6	2.5	7.0	5.7	7.9	8.9	9.5	11.8	14.9	13.9
1997 <sup>3</sup>	9.8	2.9	6.6	5.5	7.4	8.7	10.4	12.9	16.1	14.7
1996 <sup>3</sup>	10.3	2.9	6.0	5.0	6.7	8.6	11.4	15.0	17.4	15.3
1995 <sup>3</sup>	10.6	2.4	5.2	4.3	5.9	8.8	12.6	16.2	18.2	14.8
1994 <sup>3</sup>	11.5	1.7	5.0	3.9	5.9	9.6	14.4	18.0	19.3	15.8
1993 <sup>4</sup>	12.7	2.0	5.2	3.8	6.3	10.9	16.6	20.3	20.6	17.4
1992 <sup>4</sup>	13.8	1.8	5.9	4.3	7.1	12.1	18.3	21.6	21.0	16.4
1991 <sup>4</sup>	14.6	2.1	6.6	4.8	8.0	13.2	19.7	22.1	19.9	16.7
1990 <sup>5</sup>	15.9	2.0	7.5	5.3	9.1	15.0	21.2	22.7	19.7	16.4
Percent change 1990–99	–43	35	–8	4	–14	–40	–58	–56	–32	–17

See footnotes at end of table.



**Table 1. Percent of women who smoked during pregnancy by race/ethnicity and age of mother and percent change between 1990 and 1999: Specified reporting areas, 1990–99—Con.**

Race/ethnicity	Total	Age of mother								
		Less than 15 years	15–19 years		20–24 years	25–29 years	30–34 years	35–39 years	40–54 years <sup>1</sup>	
			Total	15–17 years						18–19 years
<b>American Indian<sup>6</sup></b>										
1999 <sup>3</sup>	20.0	13.9	22.6	20.7	23.9	21.2	18.4	17.4	17.9	18.1
1998 <sup>3</sup>	20.2	15.8	22.2	21.5	22.7	21.6	18.8	18.4	18.4	16.1
1997 <sup>3</sup>	20.8	16.3	23.1	22.2	23.6	21.7	19.8	18.5	19.8	20.2
1996 <sup>3</sup>	21.3	13.8	23.2	22.9	23.5	22.3	19.9	20.4	19.6	12.7
1995 <sup>3</sup>	20.9	14.7	22.1	20.8	23.0	22.1	19.8	19.7	19.3	16.4
1994 <sup>3</sup>	21.0	16.9	21.9	21.3	22.4	21.6	19.9	21.1	19.3	17.6
1993 <sup>4</sup>	21.6	14.6	22.5	22.0	22.9	22.2	21.4	21.7	17.9	18.1
1992 <sup>4</sup>	22.6	*	23.7	22.7	24.2	23.6	22.0	21.4	20.0	17.3
1991 <sup>4</sup>	22.7	16.4	23.4	22.0	24.2	23.4	22.6	21.6	20.0	17.3
1990 <sup>5</sup>	22.4	*	24.7	24.2	25.0	23.6	22.4	19.9	16.8	13.6
Percent change 1990–99	-11	<sup>7</sup> -15	-9	-14	-4	-10	-18	-13	7	33
<b>Asian or Pacific Islander</b>										
1999 <sup>3</sup>	2.9	*	9.2	9.7	9.0	5.3	2.3	1.6	1.8	2.4
1998 <sup>3</sup>	3.1	*	9.6	9.1	10.0	5.9	2.3	1.8	2.3	2.0
1997 <sup>3</sup>	3.2	*	9.6	8.9	9.9	5.3	2.5	1.9	2.2	2.4
1996 <sup>3</sup>	3.3	*	8.5	9.3	8.7	4.3	2.4	2.0	2.2	2.9
1995 <sup>3</sup>	3.6	*	9.8	7.1	9.0	6.2	3.1	2.4	2.6	2.2
1994 <sup>3</sup>	3.8	*	10.4	9.3	9.0	6.7	3.0	2.7	2.6	3.4
1993 <sup>4</sup>	5.0	*	11.8	8.7	10.1	8.0	4.0	3.6	3.5	4.3
1992 <sup>4</sup>	5.6	*	12.9	10.3	10.1	8.4	5.0	3.9	4.1	3.8
1991 <sup>4</sup>	5.2	*	9.9	10.0	9.9	7.2	4.4	3.9	4.4	4.0
1990 <sup>5</sup>	5.5	*	11.3	9.6	11.7	7.8	4.5	4.4	4.1	4.8
Percent change 1990–99	-47	...	-19	1	-23	-32	-49	-64	-56	-50

\* Figure does not meet standards of reliability or precision; based on fewer than 20 births in the numerator or denominator.

... Category not applicable.

<sup>1</sup>For 40 to 49 years old, 1990 to 1996; see reference 1.<sup>2</sup>Includes origin not stated.<sup>3</sup>Excludes California, Indiana, New York State, and South Dakota.<sup>4</sup>Excludes California, Indiana, New York City, New York State, and South Dakota.<sup>5</sup>Excludes California, Indiana, New York City, New York State, Oklahoma, and South Dakota.<sup>6</sup>Includes births to Aleuts and Eskimos.<sup>7</sup>Percent change 1991–99.

**Table 2. Percent of women who smoked during pregnancy by specified race/ethnicity and age of mother: Total reporting areas, 1999**

Race/ethnicity	Total	Age of mother						
		Less than 15 years	15–19 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years
Hispanic <sup>1</sup>	3.7	4.3	4.6	4.1	3.1	3.1	3.6	3.9
Mexican	2.6	3.3	3.3	2.7	2.2	2.3	3.0	3.1
Puerto Rican	10.5	*	10.3	11.9	9.8	9.1	9.2	11.4
Cuban	3.3	*	5.8	4.2	2.5	2.6	3.3	*
Central and South American	1.4	*	1.8	1.6	1.2	1.3	1.6	1.7
Asian or Pacific Islander <sup>2</sup>	2.9	*	9.4	5.3	2.3	1.6	1.8	2.3
Chinese	0.5	*	*	*	0.5	*	*	*
Japanese	4.5	*	*	10.6	5.0	3.1	3.1	*
Hawaiian	14.7	*	16.6	15.2	15.4	11.9	10.4	*
Filipino	3.3	*	8.9	6.5	2.9	1.8	1.8	*

\* Figure does not meet standards of reliability or precision; based on fewer than 20 births in the numerator or denominator.

<sup>1</sup>Includes other and unknown Hispanics mothers.

<sup>2</sup>Includes other Asian or Pacific Islander mothers.

NOTE: Excludes data for California and South Dakota.

**Table 3. Percent of mothers who smoked during pregnancy by educational attainment, race, and Hispanic origin of mother: Total reporting areas, 1999**

[Based on births to women aged 20 years and older]

Race and Hispanic origin	Total <sup>1</sup>	Educational attainment				
		0–8 years	9–11 years	12 years	13–15 years	16 years or more
Total	11.8	8.9	29.0	17.0	9.4	2.1
Non-Hispanic white	14.4	29.9	47.6	22.2	11.3	2.3
Non-Hispanic black	10.0	16.1	23.9	10.0	5.7	1.9
American Indian <sup>2</sup>	19.5	26.8	30.9	20.2	13.5	5.5
Asian or Pacific Islander <sup>3</sup>	2.5	1.6	6.6	4.7	2.9	0.6
Chinese	0.5	*	*	1.0	*	*
Japanese	4.3	*	*	9.8	4.2	1.4
Hawaiian	14.2	*	34.6	16.1	7.8	3.6
Filipino	2.9	*	13.6	5.2	3.3	0.7
Hispanic <sup>4</sup>	3.6	1.9	6.0	3.9	3.1	1.1
Mexican	2.5	1.5	3.7	2.8	2.3	1.0
Puerto Rican	10.5	24.0	19.6	9.8	5.9	2.0
Cuban	3.1	*	9.1	4.1	2.6	0.7
Central and South American	1.4	0.8	2.4	1.5	1.7	0.8

\* Figure does not meet standards of reliability or precision; based on fewer than 20 births in the numerator or denominator.

<sup>1</sup>Includes education not stated.

<sup>2</sup>Includes births to Aleuts and Eskimos.

<sup>3</sup>Includes other Asian or Pacific Islander mothers.

<sup>4</sup>Includes other and unknown Hispanic mothers.

NOTE: Excludes data for California and South Dakota.

**Table 4. Percent of mothers who smoked during pregnancy by State and percent change between 1990 and 1999: Specified reporting areas and each State, 1990 and 1996–99**

Reporting area	Percent of mothers					Percent change
	1999 <sup>1</sup>	1998 <sup>1</sup>	1997 <sup>1</sup>	1996 <sup>1</sup>	1990 <sup>2</sup>	1990–99
Total . . . . .	12.3	12.9	13.2	13.6	18.4	-33.2
Alabama . . . . .	12.8	12.6	12.5	13.0	16.5	-22.4
Alaska . . . . .	18.0	18.4	19.3	20.5	21.9	-17.8
Arizona . . . . .	7.4	7.6	8.7	10.3	15.0	-50.7
Arkansas . . . . .	18.7	19.0	18.6	19.3	22.6	-17.3
California . . . . .	---	---	---	---	---	---
Colorado . . . . .	10.5	11.0	10.9	12.6	18.1	-42.0
Connecticut . . . . .	8.3	9.4	9.7	10.0	13.4	-38.1
Delaware . . . . .	12.8	14.9	14.2	14.0	19.6	-34.7
District of Columbia . . . . .	3.8	4.8	5.5	7.0	16.3	-76.7
Florida . . . . .	10.3	11.2	11.4	12.2	18.3	-43.7
Georgia . . . . .	9.2	9.7	9.9	10.4	15.5	-40.6
Hawaii . . . . .	7.6	8.5	8.0	8.6	12.5	-39.2
Idaho . . . . .	12.7	13.1	13.2	14.3	15.9	-20.1
Illinois . . . . .	11.4	11.8	12.1	12.5	16.6	-31.3
Indiana . . . . .	20.9	---	---	---	---	---
Iowa . . . . .	18.2	18.9	18.3	19.0	22.6	-19.5
Kansas . . . . .	13.2	13.1	13.4	12.9	14.3	-7.7
Kentucky . . . . .	24.5	24.8	24.7	24.5	28.5	-14.0
Louisiana . . . . .	10.1	10.3	10.3	10.7	15.1	-33.1
Maine . . . . .	18.3	19.6	19.2	19.3	21.5	-14.9
Maryland . . . . .	9.8	9.8	10.2	11.3	15.8	-38.0
Massachusetts . . . . .	10.8	11.7	12.4	13.2	25.3	-57.3
Michigan . . . . .	16.0	17.0	17.6	17.6	22.6	-29.2
Minnesota . . . . .	11.8	12.4	13.0	13.1	15.8	-25.3
Mississippi . . . . .	12.6	13.0	12.6	12.8	15.8	-20.3
Missouri . . . . .	18.3	19.1	19.6	19.6	24.8	-26.2
Montana . . . . .	17.5	18.5	18.2	18.0	20.5	-14.6
Nebraska . . . . .	15.1	16.3	16.6	16.5	20.8	-27.4
Nevada . . . . .	11.7	12.8	13.6	13.4	20.1	-41.8
New Hampshire . . . . .	15.2	16.6	17.4	16.8	20.8	-26.9
New Jersey . . . . .	10.3	11.2	12.1	12.1	13.2	-22.0
New Mexico . . . . .	10.8	11.0	10.3	11.3	11.3	-4.4**
New York . . . . .	9.3	---	---	---	---	---
New York City . . . . .	3.8	4.3	4.8	4.9	---	<sup>3</sup> -41.5
New York State . . . . .	14.2	---	---	---	---	---
North Carolina . . . . .	14.3	14.9	15.2	15.8	20.7	-30.9
North Dakota . . . . .	19.2	19.5	20.1	18.4	21.9	-12.3
Ohio . . . . .	18.8	19.3	19.7	19.5	24.9	-24.5
Oklahoma . . . . .	17.9	18.6	17.8	17.4	---	<sup>4</sup> -8.7
Oregon . . . . .	14.5	15.2	16.2	17.8	22.3	-35.0
Pennsylvania . . . . .	17.2	17.5	17.9	18.1	20.9	-17.7
Rhode Island . . . . .	13.8	15.2	16.2	16.4	22.4	-38.4
South Carolina . . . . .	12.8	13.7	13.9	14.3	19.5	-34.4
South Dakota . . . . .	---	---	---	---	---	---
Tennessee . . . . .	17.1	16.8	17.4	17.6	21.9	-21.9
Texas . . . . .	6.9	7.2	7.4	7.7	10.4	-33.7
Utah . . . . .	8.1	8.7	8.7	9.3	10.8	-25.0
Vermont . . . . .	16.5	17.9	17.6	19.0	22.6	-27.0
Virginia . . . . .	9.0	10.4	11.3	11.8	15.9	-43.4
Washington . . . . .	14.4	14.6	14.6	16.0	20.2	-28.7
West Virginia . . . . .	26.1	25.6	25.3	25.5	27.8	-6.1
Wisconsin . . . . .	17.1	17.8	17.8	18.1	22.9	-25.3
Wyoming . . . . .	21.0	22.5	20.5	20.5	24.3	-13.6

\*\* Not significant at  $p < .05$ .

--- Data not available.

<sup>1</sup>Total excludes California, Indiana, New York State, and South Dakota.<sup>2</sup>Total excludes California, Indiana, New York City, New York State, Oklahoma, and South Dakota.<sup>3</sup>1994 to 1999.<sup>4</sup>1991 to 1999.

**Table 5. Percent of women 15–19 years of age who smoked during pregnancy and percent change 1990–91 to 1995–96 and 1995–96 to 1998–99: Specified reporting areas and each State, 1990 and 1991, 1995 and 1996, and 1998 and 1999**

Reporting area	1998 and 1999 <sup>1</sup>	1995 and 1996 <sup>2</sup>	1990 and 1991 <sup>3</sup>	Percent change 1990–91 to 1995–96	Percent change 1995–96 to 1998–99
	Percent	Percent	Percent		
Total . . . . .	18.0	17.0	20.3	-16	6
Alabama . . . . .	15.2	13.6	14.8	-8	12
Alaska . . . . .	27.4	29.5	31.7	-7**	-7**
Arizona . . . . .	8.3	10.9	15.3	-29	-24
Arkansas . . . . .	22.2	19.9	20.6	-3**	12
California . . . . .	---	---	---	---	---
Colorado . . . . .	16.3	17.9	24.9	-28	-9
Connecticut . . . . .	15.0	15.6	18.2	-14	-4**
Delaware . . . . .	17.2	15.1	19.6	-23	14**
District of Columbia . . . . .	3.8	3.8	4.0	-5**	1**
Florida . . . . .	13.4	13.1	16.4	-20	2**
Georgia . . . . .	12.3	11.7	13.5	-13	5
Hawaii . . . . .	13.1	10.7	16.2	-34	23
Idaho . . . . .	22.9	23.5	24.7	-5**	-3**
Illinois . . . . .	16.0	14.4	16.5	-13	11
Indiana . . . . .	<sup>4</sup> 30.3	---	---	---	---
Iowa . . . . .	32.4	29.4	33.0	-11	10
Kansas . . . . .	19.3	18.4	17.9	3**	5**
Kentucky . . . . .	35.0	31.2	32.9	-5	12
Louisiana . . . . .	10.8	9.8	11.2	-13	10
Maine . . . . .	36.6	33.2	37.3	-11	10
Maryland . . . . .	14.4	13.1	19.1	-31	10
Massachusetts . . . . .	21.2	22.5	31.3	-28	-6
Michigan . . . . .	24.2	22.4	24.0	-7	8
Minnesota . . . . .	24.9	25.3	28.2	-10	-2**
Mississippi . . . . .	12.7	10.4	12.0	-13	22
Missouri . . . . .	27.0	24.5	26.2	-6	10
Montana . . . . .	30.9	29.5	28.3	4**	5**
Nebraska . . . . .	25.1	25.4	28.6	-11	-1**
Nevada . . . . .	13.4	14.5	19.3	-25	-8**
New Hampshire . . . . .	35.1	34.6	37.2	-7**	1**
New Jersey . . . . .	16.5	13.2	15.1	-13	25
New Mexico . . . . .	12.5	10.5	12.0	-13	19
New York . . . . .	<sup>4</sup> 15.7	---	---	---	---
New York City . . . . .	4.8	5.1	---	---	-7**
New York State . . . . .	<sup>4</sup> 27.3	---	---	---	---
North Carolina . . . . .	18.5	17.9	21.1	-15	4**
North Dakota . . . . .	35.2	30.3	33.4	-9**	16
Ohio . . . . .	28.4	26.7	30.3	-12	6
Oklahoma . . . . .	23.8	20.4	---	---	17
Oregon . . . . .	25.2	27.9	33.3	-16	-10
Pennsylvania . . . . .	26.3	24.8	26.9	-8	6
Rhode Island . . . . .	22.5	23.7	30.8	-23	-5**
South Carolina . . . . .	15.8	15.0	17.5	-14	5**
South Dakota . . . . .	---	---	---	---	---
Tennessee . . . . .	21.5	19.8	22.8	-13	8
Texas . . . . .	8.7	8.5	9.7	-12	2**
Utah . . . . .	19.9	20.6	22.0	-6**	-4**
Vermont . . . . .	38.2	38.2	36.9	4**	0**
Virginia . . . . .	14.9	15.5	18.5	-16	-4**
Washington . . . . .	25.6	26.7	30.8	-13	-4**
West Virginia . . . . .	36.8	32.3	33.4	-3**	14
Wisconsin . . . . .	27.9	26.8	31.3	-14	4**
Wyoming . . . . .	33.1	29.0	29.6	-2**	14

\*\* Not significant at  $p < .05$ .

--- Data not available.

<sup>1</sup>Total excludes California, Indiana, New York State, and South Dakota for 1998 and California and South Dakota for 1999.<sup>2</sup>Total excludes California, Indiana, New York State, and South Dakota.<sup>3</sup>Total excludes California, Indiana, New York City, New York State, Oklahoma, and South Dakota.<sup>4</sup>Data for 1999 only.

**Table 6. Percent of mothers who smoked during pregnancy with selected demographic, medical, or health characteristics by age of mother: Total reporting areas, 1999**

Selected characteristics	Total	Age of mother						
		Less than 15 years	15-19 years	20-24 years	25-29 years	30-34 years	35-39 years	40-54 years
Live birth order		Percent of mothers						
First . . . . .	10.8	7.9	17.3	13.0	6.3	5.5	7.6	6.9
Second . . . . .	12.1	*	21.1	18.1	10.6	7.1	8.1	8.0
Third . . . . .	14.8	*	22.4	22.4	15.7	10.3	10.3	10.2
Fourth or higher . . . . .	18.1	*	21.1	24.9	21.1	16.2	14.6	12.4
Marital status								
Married . . . . .	8.4	10.6	17.1	12.8	7.8	6.0	6.9	6.6
Unmarried . . . . .	21.0	7.7	18.4	20.9	22.2	24.8	28.3	25.0
Birthplace of Mother								
Born in the 50 States and DC . . . . .	14.6	8.5	20.1	19.3	12.9	10.0	11.5	11.2
Born outside the 50 States and DC . . . . .	2.3	*	2.7	2.5	2.1	2.1	2.8	2.8
Birthweight								
Less than 1,500 grams <sup>1</sup> . . . . .	16.2	9.9	19.2	18.6	15.2	12.8	16.1	13.0
Less than 2,500 grams <sup>2</sup> . . . . .	19.4	9.1	21.2	22.7	18.3	15.8	19.3	17.4
2,500 to 3,999 grams . . . . .	12.7	7.6	18.1	16.7	11.0	8.6	9.8	9.4
4,000 grams or more . . . . .	6.5	*	13.8	10.4	5.8	4.1	4.0	3.7
Plurality								
Single . . . . .	12.7	7.8	18.2	16.7	11.0	8.6	10.0	9.8
Twin . . . . .	10.6	*	14.4	15.2	11.2	8.0	8.3	5.0
Higher order <sup>3</sup> . . . . .	3.2	*	*	11.7	3.6	2.1	2.7	*
Trimester prenatal care began								
First . . . . .	11.5	9.5	18.9	16.0	9.9	7.5	8.5	8.1
Second . . . . .	17.6	6.7	17.0	19.1	17.1	16.4	18.5	16.4
Third . . . . .	18.6	5.2	16.2	20.0	18.5	19.0	22.2	18.8
None . . . . .	24.6	6.5	16.5	21.8	27.0	30.9	36.3	33.9

\* Figure does not meet standards of reliability or precision; based on fewer than 20 births in the numerator or denominator.

<sup>1</sup>Very low birthweight.<sup>2</sup>Low birthweight.<sup>3</sup>Births in greater than twin deliveries.

NOTE: Excludes data for California and South Dakota.

**Table 7. Percent low birthweight by smoking status, race, and Hispanic origin of mother: Total reporting areas, 1999**

Race and Hispanic origin	Total <sup>1</sup>	Smoking status		Ratio between smoker and nonsmoker
		Smoker	Nonsmoker	
Total . . . . .	7.8	12.1	7.2	1.7
Non-Hispanic white . . . . .	6.7	10.8	5.9	1.8
Non-Hispanic black . . . . .	13.3	21.1	12.5	1.7
American Indian <sup>2</sup> . . . . .	7.3	10.1	6.5	1.6
Asian or Pacific Islander <sup>3</sup> . . . . .	7.7	12.0	7.6	1.6
Chinese . . . . .	5.2	*	5.1	*
Japanese . . . . .	8.6	12.3	8.4	1.5
Hawaiian . . . . .	7.9	11.2	7.4	1.5
Filipino . . . . .	8.7	11.9	8.5	1.4
Hispanic <sup>4</sup> . . . . .	6.8	11.8	6.6	1.8
Mexican . . . . .	6.3	11.1	6.1	1.8
Puerto Rican . . . . .	9.4	14.1	8.8	1.6
Cuban . . . . .	6.8	8.9	6.7	1.3
Central and South American . . . . .	6.4	8.7	6.4	1.4

\* Figure does not meet standards of reliability or precision; based on fewer than 20 births in the numerator or denominator.

<sup>1</sup>Includes smoking during pregnancy not stated.<sup>2</sup>Includes births to Aleuts and Eskimos.<sup>3</sup>Includes other Asian or Pacific Islander mothers.<sup>4</sup>Includes other and unknown Hispanic mothers.

NOTE: Excludes data for California and South Dakota.

**Table 8. Comparison of percent of mothers who smoked during pregnancy by race/ethnicity and age of mother for different reporting areas: 1998 and 1999**

Race/ethnicity and reporting area	Total	Age of mother									
		Less than 15 years	15–19 years						30–34 years	35–39 years	40–54 years <sup>1</sup>
			Total	15–17 years	18–19 years	20–24 years	25–29 years	Percent of mothers			
Total <sup>1</sup>											
1999 for 48 States and DC <sup>2</sup> . . . . .	12.6	7.8	18.1	15.5	19.5	16.7	11.0	8.6	9.9	9.5	
1999 for 46 States and DC <sup>3</sup> . . . . .	12.3	7.5	17.5	15.0	18.9	16.2	10.7	8.4	9.8	9.5	
1998 for 46 States and DC <sup>3</sup> . . . . .	12.9	7.7	17.8	15.5	19.2	16.5	11.4	9.3	10.6	10.0	
Hispanic											
1999 for 48 States and DC <sup>2</sup> . . . . .	3.7	4.3	4.6	4.3	4.9	4.1	3.1	3.1	3.6	3.9	
1999 for 46 States and DC <sup>3</sup> . . . . .	3.7	4.3	4.5	4.2	4.7	4.1	3.1	3.1	3.6	3.9	
1998 for 46 States and DC <sup>3</sup> . . . . .	4.0	4.1	4.9	4.6	5.1	4.2	3.3	3.4	4.2	4.4	
Non-Hispanic white											
1999 for 48 States and DC <sup>2</sup> . . . . .	15.9	20.8	30.1	28.7	30.8	23.9	13.5	9.5	10.6	9.9	
1999 for 46 States and DC <sup>3</sup> . . . . .	15.7	20.3	29.6	28.3	30.2	23.4	13.2	9.4	10.6	9.9	
1998 for 46 States and DC <sup>3</sup> . . . . .	16.2	21.4	29.8	28.6	30.3	23.5	13.9	10.2	11.2	10.5	
Non-Hispanic black											
1999 for 48 States and DC <sup>2</sup> . . . . .	9.4	2.8	7.2	5.7	8.1	9.3	9.2	10.4	13.5	14.0	
1999 for 46 States and DC <sup>3</sup> . . . . .	9.1	2.7	6.9	5.5	7.8	9.0	8.9	10.1	13.3	13.6	
1998 for 46 States and DC <sup>3</sup> . . . . .	9.6	2.5	7.0	5.7	7.9	8.9	9.5	11.8	14.9	13.9	
American Indian <sup>4</sup>											
1999 for 48 States and DC <sup>2</sup> . . . . .	20.2	14.7	22.9	21.0	24.1	21.5	18.7	17.6	18.0	18.2	
1999 for 46 States and DC <sup>3</sup> . . . . .	20.0	13.9	22.6	20.7	23.9	21.2	18.4	17.4	17.9	18.1	
1998 for 46 States and DC <sup>3</sup> . . . . .	20.2	15.8	22.2	21.5	22.7	21.6	18.8	18.4	18.4	16.1	
Asian or Pacific Islander											
1999 for 48 States and DC <sup>2</sup> . . . . .	2.9	*	9.4	10.0	9.2	5.3	2.3	1.6	1.8	2.3	
1999 for 46 States and DC <sup>3</sup> . . . . .	2.9	*	9.2	9.7	9.0	5.3	2.3	1.6	1.8	2.4	
1998 for 46 States and DC <sup>3</sup> . . . . .	3.1	*	9.6	9.1	10.0	5.9	2.3	1.8	2.3	2.0	

\* Fewer than 20 births.

<sup>1</sup>Includes origin not stated.<sup>2</sup>Excludes California and South Dakota.<sup>3</sup>Excludes California, Indiana, New York State, and South Dakota.<sup>4</sup>Includes births to Aleuts and Eskimos.

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