

Smoking and Pregnancy Outcome: Trends among Black Teenage Mothers in Missouri

ABSTRACT

Objectives. The purpose of this study is to analyze the smoking changes that have occurred among pregnant Black teenagers in Missouri. The study also examines changes in Black teenage pregnancy outcomes in relation to smoking behavior changes.

Methods. This analysis used computerized data files from the 1978 to 1990 Missouri birth certificates to acquire information on smoking during pregnancy for 41 544 Black teenagers and 105 170 White teenagers. All Missouri births with smoking history were included in the study.

Results. During the study period, the rate for Blacks who smoked during pregnancy decreased from 37% in 1978 to less than 22% in 1990. A large part of this reduction is attributable to Black teenagers, whose smoking-during-pregnancy rate declined from 35.8% to 7.2%. Additionally, the Black teenage-specific low-birthweight rate decreased by 13.6% over the study period, possibly influenced by the decrease in smoking.

Conclusions. The results indicate that a major norm has changed in smoking status among pregnant Black teenagers. Understanding the reasons behind this change could assist smoking cessation and other health promotion efforts. (*Am J Public Health*. 1993;83:1121-1124)

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Introduction

Self-reported smoking rates have dropped only modestly in the past decade. In Missouri, the smoking rate for all pregnant women dropped from 31.3% in 1978 to 24.7% in 1990. Many studies have reported on the characteristics of women who smoke during pregnancy.¹⁻⁸ These studies have concluded that pregnant women with high smoking rates are typically Black, unmarried, and less educated.⁴ However, one population subgroup, Black teenagers, defies the smoking stereotype. Although these women are typically unmarried with low educational attainment, their smoking rates have decreased faster than those of any other demographic group.⁷

This study analyzes the smoking changes that have occurred among pregnant Black teenagers in Missouri compared with other demographic groups. Because smoking affects low birthweight and infant death rates, this study also examines the corresponding changes in Black teenage pregnancy outcomes in relation to changes in smoking behavior.

Methods

Data for this analysis are from Missouri live birth certificates for 1978 to 1990. The 13-year computer data set has smoking information on 990 042 live births, of which 41 544 are for Black teenagers and 105 170 are for White teenagers. The smoking criterion was defined as "cigarettes smoked per day," with possible responses of "none," "less than a pack per day," and "a pack or greater per day" for the years 1978 through 1988. The criterion was revised in 1989 to conform to the new US standard birth certificate, which asks whether tobacco was used

during pregnancy and how many cigarettes were smoked each day on average. The mothers were categorized as smokers or nonsmokers regardless of the number of cigarettes smoked.

The smoking question on the database for this analysis is 97% complete. Stockbauer and Land⁷ have shown that the data are consistent with the National Natality Survey.

A question was also added to the Missouri birth certificate in 1989 to determine if the mother was a Medicaid participant during this pregnancy. The data from this question have been compared with data in the statewide linked birth certificate/Medicaid file and found to be 94% accurate.⁹

Results

The self-reported smoking rate for all Missouri women who delivered a live birth decreased from 31.3% in 1978 to 24.7% in 1990. Although the White rate dropped from 30.3% to 25.6% over that period, the Black rate decreased more substantially—from 37.0% to 21.5%—and has been lower than the corresponding White rate since 1987.

As shown in Figures 1 and 2, the large decrease in the rate of smoking by Blacks during pregnancy is primarily due to changes among Black teenagers. Figure 1

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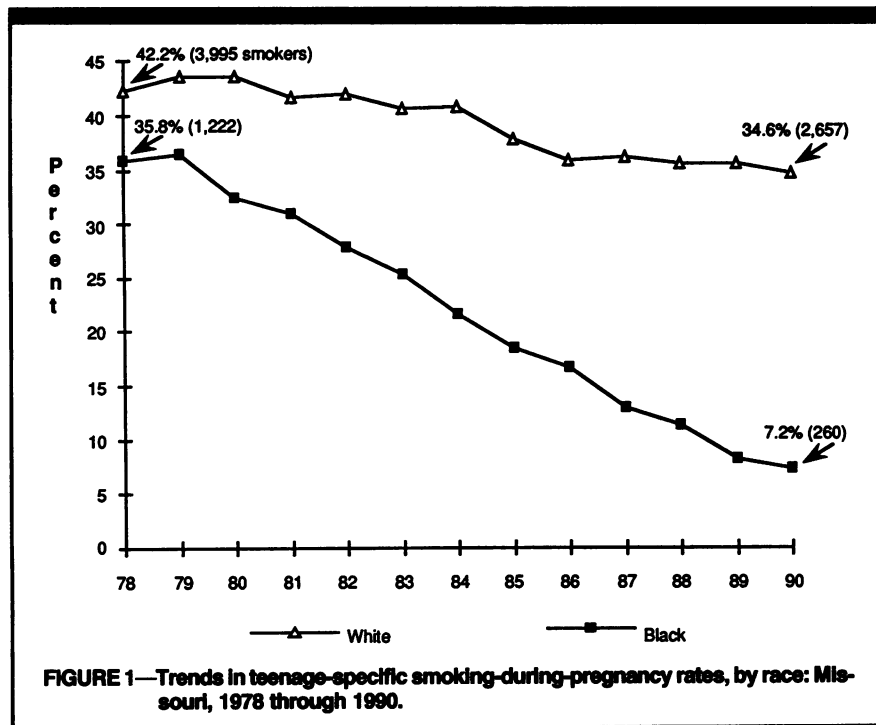


FIGURE 1—Trends in teenage-specific smoking-during-pregnancy rates, by race: Missouri, 1978 through 1990.

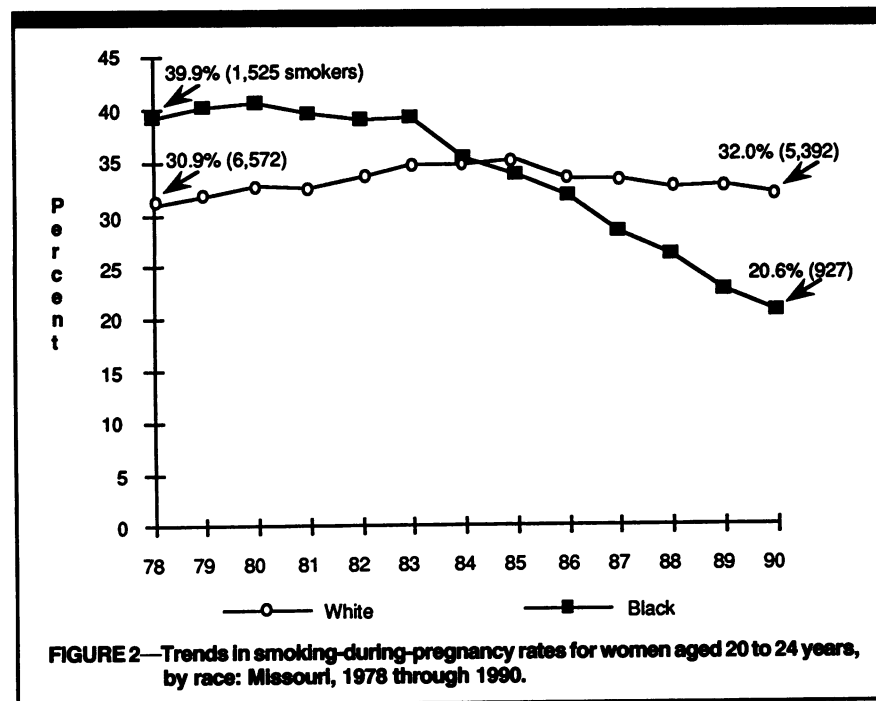


FIGURE 2—Trends in smoking-during-pregnancy rates for women aged 20 to 24 years, by race: Missouri, 1978 through 1990.

shows that the Black teenage smoking rate decreased 79.9%, from 35.8% to 7.2%. The biggest drop occurred among Blacks under age 18; their 1990 smoking rate of 4.9% was 84.5% below their corresponding 1978 rate. During the same period, the White teenage smoking rate decreased by 18.0%, from 42.2% to 34.6%, with the rate for Whites under age 18 decreasing 22.6%.

Figure 2 shows that, for women aged 20 to 24, the rate of smoking during pregnancy remained relatively constant for

Whites over the study period. For Black women, however, the rate showed little change until 1984, after which it decreased 41.6%. This follows from the fact that those aged 15 to 19 in 1978 became 20- to 24-year-olds in 1983 and reported a corresponding drop in smoking. A regression test of coincidence showed that the 1978 to 1985 smoking-during-pregnancy trend line for Black women aged 15 to 19 was no different than the 1983 to 1990 trend line for Black women aged 20 to 24 years. The

observed reduction in smoking during pregnancy for Black women aged 20 to 24 since 1984 is also evident if analysis is restricted to first births.

The smoking-during-pregnancy rate for Black women aged 25 to 29 remained relatively flat at about 35% until 1988, after which it decreased 12.5% to 30.8% in 1990. This decrease could be a reflection of the cohort of Black women aged 15 to 19 in the late 1970s moving into the 25- to 29-year-old cohort in the late 1980s. The corresponding smoking-during-pregnancy rate for White women aged 25 to 29 remained flat during the study period, averaging about 23.4%.

Smoking among Black pregnant women aged 30 and over increased by 13.2% during the study period, from 29.6% in 1978 to 33.5% in 1990 while the corresponding White rate decreased by 27.2%, from 25.4% to 18.5%. If most Black women start their smoking habits as teenagers, one would expect the smoking rate for Black women aged 30 plus to start to decline after 1993, when the teen cohort of the late 1970s starts to move into the 30-plus category.

Blacks in Missouri primarily live in the Kansas City and St. Louis metropolitan areas and in a few rural areas such as the Bootheel region in Southeast Missouri. The drop in the Black teenage smoking-during-pregnancy rate occurred in all areas of the state. The urban rate decreased from 39.9% to 6.8% while the rural rate decreased from 26.7% to 10.3% during the study period.

As to why smoking behavior among Black teenagers has changed so dramatically, one hypothesis is that low-income teenagers have less disposable income with which to buy cigarettes. In 1990, 96.2% of pregnant Black teenagers were not married and 73.4% were on Medicaid. For pregnant White teenagers, 58.0% were not married and 58.1% were on Medicaid. Figure 3 compares the 1990 smoking rates for pregnant women on Medicaid by race and age. The smoking rates are comparable for women of both races aged 25 and over; however, the rate for White teenagers on Medicaid is more than five times higher than the corresponding rate for Black teenagers (40.9% vs 7.9%). Among pregnant teenagers not on Medicaid, the smoking rate for Blacks is 5.0% compared with 25.6% for Whites. Thus, regardless of Medicaid status, pregnant Black teenagers have substantially lower rates of smoking during pregnancy than most any other demographic group.

Because the change in smoking behavior among Black teenagers has been so

dramatic, it is worthwhile to determine if it has brought any demonstrable benefit to the Black newborns. The overall and non-teen low birthweight rates for Whites remained relatively flat during the study period, and there was a small but not statistically significant decline for White teenagers. The overall Black-specific low birthweight rate did not vary much over the study period. However, as shown in Figure 4, the low birthweight rate for Black teenagers decreased 13.6% from 15.4% in 1978 to 13.3% in 1990 ($P < .05$; confidence interval [CI] = 1.01, 1.30).

Concurrent with the dramatic decrease in Black teenagers smoking during pregnancy, there was a 22.2% decrease in the percentage who were underweight for height as per body mass index (weight in kilograms/height in meters squared = less than 19.2); and increases in third trimester entry or no prenatal care (8.3% to 13.3%), and in having one or more prior live births (27.9% to 33.1%). Because smoking and underweight for height are highly intercorrelated ($r = .7154$), it is not feasible to provide a measure of how a decrease in smoking contributes independently to the observed reduction in the low birthweight rate for infants born to Black teenagers.¹⁰

The infant death rate for Black teenagers decreased 41.6% from 33.9 per 1000 live births in 1978 to 19.8 in 1990. Kleinman et al.¹¹ estimated that eliminating smoking during pregnancy would decrease infant deaths by 7% to 11%, assuming that mothers who stopped smoking would experience the same infant mortality as their counterparts who do not smoke. This translates into fewer than one death per year if no Black teenagers smoked during pregnancy. However, the expected decrease in Black infant deaths due to smoking change is too small to detect statistical significance.

Discussion

The results of this study indicate that a major smoking status norm has changed among pregnant Black teenagers. Whereas just over a decade ago, nearly 4 out of 10 Black teenagers smoked during pregnancy, today fewer than 1 out of 10 smoke and only 1 out of 20 pregnant Blacks younger than age 18 smoke during pregnancy. Because this is the only demographic group that has changed so dramatically, we must question if the change is real and, if it is, explore why.

Previous studies^{12,13} have shown that smoking prevalences based on self-report are underestimates of the true prevalence

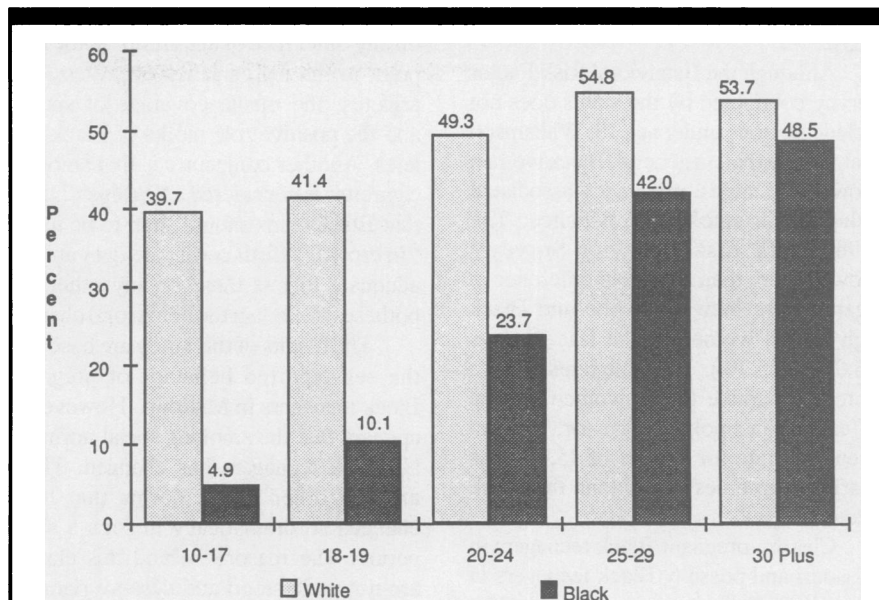


FIGURE 3—Percentage of Medicaid women who smoked during pregnancy, by age and race: Missouri, 1990.

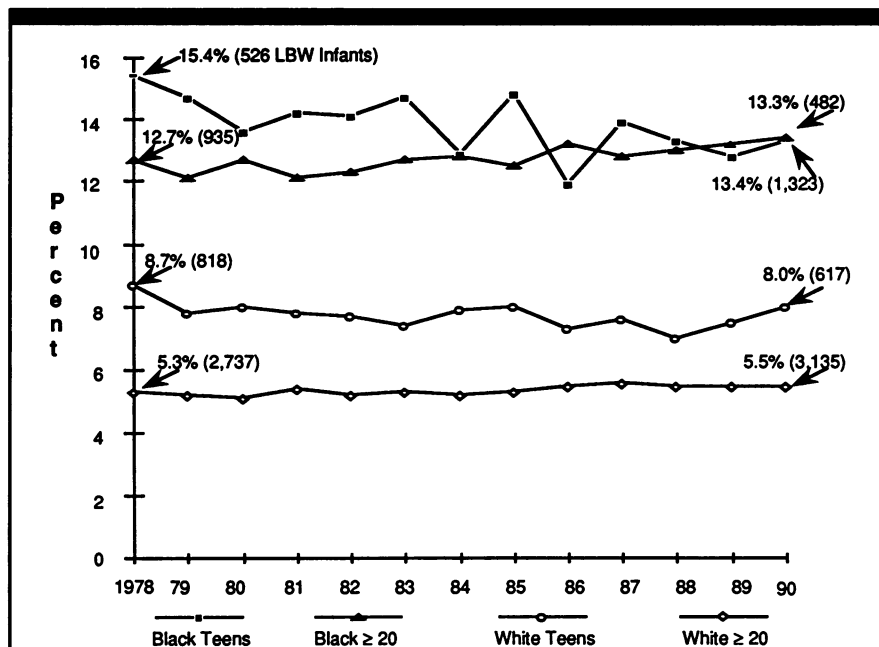


FIGURE 4—Trends in percentage of low birthweight, by mother's age and race: Missouri, 1978 through 1990.

in some populations. Wagenknecht et al.,¹³ using serum cotinine to validate smoking, found that self-report underestimated smoking prevalence by 3.3% among Blacks aged 18 to 30 with a high school education or less. Even if the magnitude of denial of smoking among Black teenagers was larger, however, there is no evidence that denial has increased over the study years to the degree needed to negate the findings.

There are no other population-based

surveys of smoking during pregnancy that cover the same period for teenagers. However, our results are similar in magnitude to findings of the National Institute on Drug Abuse-approved High School Senior Survey on Smoking.¹⁴ In that study, the Black smoking rate for female seniors decreased from 22.3% between 1976 and 1979 to 7.1% between 1985 and 1989. A similar decrease in smoking prevalence was noted for Black men. In contrast, the White female smoking rate for

the same period decreased from 29.7% to 22.5%.

Although the Behavioral Risk Factor Survey conducted by the states does not include persons under age 18, Williamson et al.⁶ found that, in general, Black women showed the largest pregnancy-associated reduction in smoking prevalence. The 1990 Youth Risk Behavior Survey¹⁵ showed more than a twofold difference in cigarette use between White and Black high school women in the last 30 days (36.0% vs 15.7%). The male rates by race were comparable to the women's racial differences in smoking behavior. The frequent use rate for Whites of 15.9% was nearly seven times higher than the Black rate of 2.3%.

Clearly, pregnant Black teenagers in Missouri and possibly Black teenagers in general currently have one of the lowest smoking rates of all demographic groups. The Black teenage smoking rate is now similar to that of White college-educated women (7.2% vs 5.6%).

Given that smoking is one of the major nonmedical factors related to low birthweight, it is hard to believe that the reduction in smoking did not have some influence on the Black teenage-specific low-birthweight rate. However, we could not determine the exact contribution.

The obvious question is what precipitated this change in social norm among Black teenagers, given that there was no specific smoking intervention focused on Black teenagers in Missouri during the period. The change may have occurred because Black teenagers are more likely to live in an extended family that has older persons affected by smoking-related health conditions. Another possibility is that the ban on television and radio advertising, which was started in 1971, had

more of an effect on Black teenagers than on any other race or age group. Some may point to the high salaries of professional athletes, the media coverage of sports, and the positive role model of Black athletes. Another conjecture is that smoking cigarettes is considered a "Whitish" thing that Black teens should shun to be in the "in crowd." Birth certificate data are not adequate to test these or any other hypotheses to explain the behavioral change.

The results of this study are based on the self-reported behavior of pregnant Black teenagers in Missouri. However, it appears that the smoking social norm for all Black teenagers has changed. There are few other health norms that have changed so dramatically in such a short period. The reasons behind this change are not understood and deserve rigorous study. Understanding them could assist smoking cessation and other health promotion efforts. □

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