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ORIGINAL CONTRIBUTION

Rates of and Factors Associated With Recurrence of Preterm Delivery

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Context Information about risk of recurrent preterm delivery is useful to clinicians, researchers, and policy makers for counseling, generating etiologic leads, and measuring the related public health burden.

Objectives To identify the rate of recurrence of preterm delivery in second pregnancies, factors associated with recurrence, and the percentage of preterm deliveries in women with a history of preterm delivery.

Design and Setting Population-based cohort study of data from birth and fetal death certificates from the state of Georgia between 1980 and 1995.

Subjects A total of 122 722 white and 56 174 black women with first and second singleton deliveries at 20 to 44 weeks' gestation.

Main Outcome Measure Length of gestation (categorized as 20-31, 32-36, or ≥37 weeks) at second delivery compared with length of gestation at first delivery, by age and race.

Results Most women whose first delivery was preterm subsequently had term deliveries. Of 1023 white women whose first delivery occurred at 20 to 31 weeks, 8.2% (95% confidence interval [CI], 6.6%-10.1%) delivered their second birth at 20 to 31 weeks and 20.1% (95% CI, 17.7%-22.8%) at 32 to 36 weeks. Of 1084 comparable black women, 13.4% (95% CI, 11.4%-15.6%) delivered at 20 to 31 weeks and 23.4% (95% CI, 20.9%-26.1%) delivered at 32 to 36 weeks. Among women whose first delivery occurred at 32 to 36 weeks, all corresponding rates were lower than those whose first birth was at 20 to 31 weeks; the rates of second birth at 20 to 31 weeks were substantially lower (for white women, 1.9% [95% CI, 1.7%-2.2%]; for black women, 3.8% [95% CI, 3.4%-4.2%]). Compared with women aged 20 to 49 years at their second delivery, women younger than 18 years had twice the risk of recurrence of delivery at 20 to 31 weeks. Of all second deliveries at 20 to 31 weeks, 29.4% for white women and 37.8% for black women were preceded by a preterm delivery.

Conclusions Our data suggest that recurrence of preterm delivery contributes a notable portion of all preterm deliveries, especially at the shortest gestations.

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In 1997 in the United States, approximately 10% (n = 310 843) of white newborns and 18% (n = 104 152) of black newborns were delivered preterm, before 37 completed weeks of gestation.[1] Preterm birth increases the risks for infant morbidity and mortality. Clinicians can use information on rates of repeat preterm delivery in counseling patients; those who have already experienced a preterm delivery are likely to be especially anxious for guidance. Researchers may find that identifying risk factors for recurrent preterm delivery suggests hypotheses about the etiology of preterm delivery, the cause of which is largely unknown.[2] In addition, policy makers responsible for directing prenatal care and for allocating research funds need to know the contribution of recurrent preterm delivery to the overall rate of preterm delivery. We used birth and fetal death certificates filed in Georgia from 1980 through 1995 to compute the rate of recurrence of singleton preterm delivery in second pregnancies.

METHODS

Study Population

We used fetal death and birth certificates to identify successive pregnancies occurring to individual mothers (pregnancy histories). Methods for constructing pregnancy histories by linking vital records and an evaluation of these histories have been published.[3,4] From these histories, we identified women whose first and second pregnancies ended in singleton stillbirths or live births of newborns weighing at least 500 g or, if birth weight was unknown, women who delivered at 20 weeks or more of gestation. To ensure that we analyzed consecutive births, we required that the month and year of the preceding birth listed on the second birth certificate match exactly the month and year recorded on the certificate for the first birth. We considered the length of gestation to be the number of full weeks between the last menstrual period and birth, and we assessed the plausibility of this variable using sex- and race-specific standards.[5] We excluded those who had 1 or more pregnancies whose gestational length was unknown, was shorter than 20 weeks or longer than 44 weeks,

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or was implausible given the infant's birth weight. We restricted the study population to women who were white or black.

Data Sources

All data for this study derived from fetal death or live birth certificates. The outcome of interest was length of gestation in the second pregnancy, but this measure was nonrandomly missing for a substantial percentage of pregnancies. As birth weight was available for nearly all newborns, we considered it a proxy for gestation and conducted parallel analyses using birth weight. We analyzed all preterm deliveries (<37 weeks) as well as 3 subsets of these deliveries composed of very preterm (20-27 and 28-31 weeks) and moderately preterm (32-36 weeks) deliveries. These 3 subsets correspond to different levels of risk for infant mortality and morbidity.[6,7] Because the number of deliveries at 20 to 27 weeks' gestation was small, we combined them in multivariate analyses with those at 28 to 31 weeks. For low birth weight, we used the conventional subsets of very low birth weight (VLBW, <1500 g) and moderately low birth weight (MLBW, 1500-2499 g).

Key variables were length of gestation and birth weight in the first pregnancy (categorized in the same way as for the second pregnancy). In analyzing the risk of recurrence of preterm delivery or delivery of low-birth-weight newborns, we examined the following second-pregnancy variables that might affect this risk: sex of the infant, interpregnancy interval, year of delivery, presence or absence of the father's name on the birth certificate, maternal education and smoking, and outcome (live or stillborn). We also checked for the potentially confounding effects of these variables.

Interpregnancy interval was defined as the number of months between the date of birth for the first pregnancy and the last menstrual period for the second pregnancy. The father's name was coded as present for both pregnancies or absent for 1 or both pregnancies. In Georgia during the study years, the father's name was routinely listed on birth certificates of married women. To be listed on the certificate of an unmarried woman, the father had to give his written permission. Thus, women for whom the father's name was listed for both pregnancies might, on average, have had greater paternal support. Because information on maternal smoking was available only after 1988, analyses that included smoking were restricted to second deliveries after that year. All variables were categorical.

Statistical Analysis

To evaluate potential bias in our analysis of preterm recurrence that might be related to the availability of gestational-length data, we compared the birth-weight distribution and personal characteristics of the group of women for whom gestational-length data were available for both pregnancies with those of women for whom gestational-length data were missing for 1 or both pregnancies. We then computed the crude rates of preterm delivery for the first and second pregnancy and rates of recurrence of preterm delivery.

Among the subsets of women whose first delivery was preterm or whose first newborn had a low birth weight, we used logistic regression to look for factors associated with recurrence of the same outcome of the first delivery. For analyses of the preterm subsets, the comparison group consisted of women who had term deliveries (≥37 weeks) in their second pregnancies. For analyses of the low-birth-weight subsets, we used normal birth weight (≥2500 g) as the control group. Because of racial differences in the background rates of preterm delivery, we stratified all analyses by maternal race. We defined confounding to be present when the adjusted odds ratio (OR) differed from the crude OR by at least 10%. We assessed each model by using the Hosmer-Lemeshow goodness-of-fit test and comparing the predicted and observed distributions of outcomes. Because recurrences of preterm delivery or low-birth-weight newborns were not rare, ORs computed from logistic regression were expected to overestimate relative risks (RRs).[8] When we used the method of Zhang and Yu[8] to compute the RRs from the adjusted ORs, however, we found that the ORs only marginally overestimated the RRs, presumably because nearly all the ORs were moderate. Hence, except for a few illustrative comparisons of ORs and RRs, we present ORs only. We excluded women from logistic regression models when information for at least 1 of the variables in the model was missing. Finally, we computed the percentage of preterm deliveries in the second pregnancy that were preceded by a preterm delivery.

Analysis of these data was approved by the institutional review board at the Centers for Disease Control and Prevention.

RESULTS

Completeness of Study Population

From 1980 through 1995, 1 820 110 live birth or fetal death events were recorded in Georgia. We identified 155 519 white women and 75 556 black women who had first and second singleton pregnancies during this period. Fifty-three percent of white women and 55% of black women with a first delivery in 1980 through 1984 were included in these groups; for women with first deliveries in 1985 through 1989 or after 1989, the comparable percentages were 48% and 52% for white women and 23% and 25% for black women, respectively.

Availability of Data on Length of Gestation

Acceptable data for determining length of gestation for both the first and second pregnancies were available for 122 722 (78.9%) of white women and 56 174 (74.3%) of black women. In contrast, newborns' birth-weight data for both pregnancies were available for 98.6% of white women and 99.0% of black women. Higher percentages of women who, in their first pregnancies, delivered newborns weighing at least 2500 g had acceptable gestational-length data for both pregnancies (white

women, 80.4%; black women, 76.3%) than did women who delivered newborns weighing 1500 to 2499 g (white women, 58.3%; black women, 61.3%) or less than 1500 g (white women, 63.7%; black women, 60.6%). Similar patterns were observed for second pregnancies (data not shown). Also, among both white women and black women, the subgroups of women who had characteristics typically associated with increased risk for adverse pregnancy outcomes (eg, they were young, unmarried, had a lower level of education, initiated prenatal care late in the pregnancy, or had no prenatal care) had a lower percentage of acceptable gestational-length data for both pregnancies than did women at lower risk. Finally, for women of both races, the percentage with acceptable data for gestational length of both pregnancies was stable across the study years (data not shown).

Rate of Preterm Delivery

For white women, rates of preterm delivery (<37 weeks), moderately preterm delivery (32-36 weeks), very preterm delivery (20-31 weeks), low-birth-weight newborns (<2500 g), MLBW newborns (1500-2499 g), and VLBW newborns (<1500 g) were higher for first pregnancies than for second pregnancies (TABLE 1). For black women, rates of preterm delivery, moderately preterm delivery, low-birth-weight newborns, and MLBW newborns decreased from the first to second pregnancies. In contrast, among black women the rates of very preterm delivery and VLBW newborns were nearly the same for the first and second pregnancies. Over time for both races, the rate of very preterm delivery increased for first births but decreased among second births (data not shown). Similar temporal trends occurred for the rate of VLBW newborns.

Recurrence of Preterm Delivery

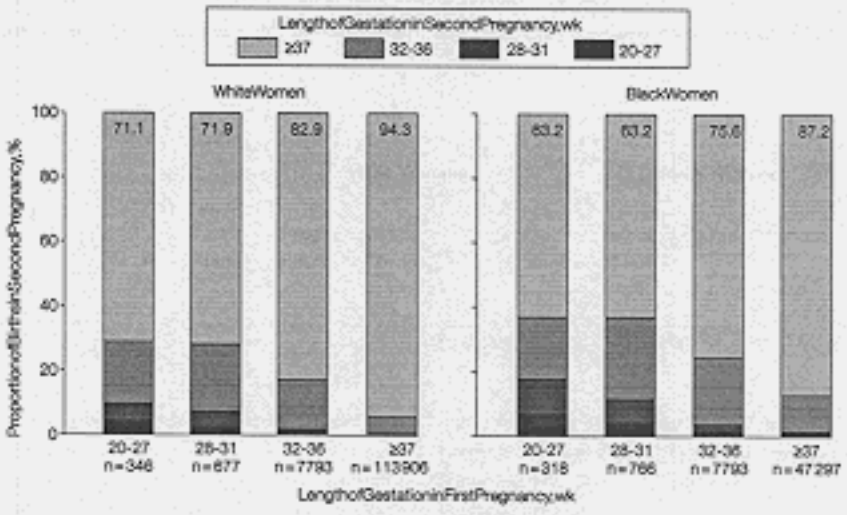
Crude rates of recurrence of preterm delivery were higher for black women than for white women. Among those in the study whose first pregnancy ended in a preterm delivery, 19.9% of white women and 26.0% of black women had a preterm delivery in their second pregnancy (data not shown). For both white women and black women, the rate of preterm delivery in the second pregnancy increased as the length of first pregnancy decreased (FIGURE). Among women whose first pregnancies lasted only 20 to 27 weeks, 28.9% of white women and 36.8% of black women had a preterm delivery in their second pregnancy.

For both white women and black women whose first deliveries were very preterm (20-31 weeks), the rate of preterm delivery in the second pregnancy showed no sustained trend during the years of the study (TABLE 2). For example, among white women in this group, rates of preterm second births were 24.2% for 1980 through 1984; 29.9% for 1985 through 1989; and 28.6% for 1990 through 1995. In contrast, over time among both white women and black women who had very preterm deliveries in their first pregnancies, very preterm deliveries made up a steadily declining percentage of all

Table 1. Distribution of Pregnancies by Length of Gestation and Birth Weight and by Race and Birth Order in Georgia, 1980-1995

	White Women		Black Women	
	First Pregnancy	Second Pregnancy	First Pregnancy	Second Pregnancy
Percentage Distribution of Pregnancies by Length of Gestation				
Length of gestation, wk	n = 122 722		n = 56 174	
<32	0.9	0.6	2.0	2.1
20-27	0.3	0.2	0.6	0.8
28-31	0.6	0.4	1.4	1.3
<37	7.3	6.6	15.9	14.9
32-36	6.4	6.0	13.9	12.8
≥37	92.8	93.4	84.2	85.1
Distribution of Pregnancies by Birth Weight				
	n = 153 392		n = 74 773	
Birth weight, mean (SD), g	3380 (549)	3454 (538)	3094 (555)	3159 (576)
<1500	0.8	0.6	1.6	1.7
1500-2499	4.4	3.3	9.4	7.9
≥2500	94.8	96.1	89.0	90.4

Figure. Distribution of Length of Gestation of Second Pregnancy by Length of Gestation of First Pregnancy in Georgia, 1980-1995



Percentages in bars indicate proportion of second pregnancies that were 36 weeks or longer.

the preterm deliveries in the second pregnancy. Among white women, this percentage decreased from 36.8% in 1980 through 1984 to 23.8% in 1990 through 1995. For comparable black women, this value was 53.4% in 1980 through 1984 and 31.2% in 1990 through 1995. Similar patterns were not seen among women whose first newborn had VLBW (Table 2).

For women of both races, the rate of preterm delivery or low-birth-weight newborns in the second pregnancy among women whose first newborn was delivered moderately preterm (32-36 weeks) or had MLBW (1500-2499 g) was lower in 1990 through 1995 than in 1980 through 1984. Additionally, very preterm or VLBW births decreased as a percentage of all preterm or low-birth-weight births (Table 2).

Factors Associated With Recurrence

Recurrence was defined for these analyses as a repeat delivery in the same subset (eg, a very preterm delivery in the second pregnancy among women whose first delivery was also very preterm). Maternal age was the only variable we examined that was associated with recurrence in more than 1 analysis (TABLE 3). Among women whose first delivery was very preterm or whose first newborn had VLBW, we had 1 statistically significant finding. Specifically, black women whose first delivery was very preterm and who were younger than 18 years at their second delivery were significantly more likely than the referent group (women aged 20-49 years at their second delivery) to have a very preterm delivery in the second pregnancy (adjusted OR, 2.0; 95% CI, 1.2-3.5). The RR, which we computed from the adjusted OR, was 1.8. Among white women, the adjusted OR was 2.3 (RR, 2.1) in the comparable analysis, but this statistic was not significant (95% CI, 0.9-5.6). Among black women whose first delivery was very preterm and who were younger than 18 years at the second pregnancy, 22.6% of the second deliveries were very preterm and 26.0% were moderately preterm. Among comparable black women aged 20 to 49 years at the second birth, the rates were 10.8% and 22.6%, respectively. Comparable values for white women were 15.1% and 26.4% (aged <18 years) and 7.7% and 19.2% (aged 20-49 years). Among women whose first delivery was very preterm, 5.2% of white women and 16.4% of black women were younger than 18 years at their second delivery.

Among the groups whose first delivery was at 32 to 36 weeks and those whose first newborn had MLBW, 8 findings were significant (6 showing increased risk and 2 showing decreased risk). Three significant adjusted ORs were for maternal age younger than 18 years (20-49 years was the referent group). Black women younger than 18 years whose first delivery was at 32 to 36 weeks had an increased risk of recurrence for delivery at 32 to 36 weeks. Likewise, black women younger than 18 years whose first newborn had MLBW had an increased risk for recurrence of newborns with MLBW. Among white women in the same age group, only those whose first newborn had MLBW were at increased risk for recurrence. A second set of 4 findings was for interpregnancy interval; 12 to 47 months was the referent. Black women whose first delivery was at 32 to 36 weeks and who had intervals between pregnancies of more than 47 months had a decreased risk of recurrent moderately preterm delivery. White women whose first newborn had MLBW and had an interval between pregnancies of more than 47 months had a moderately increased risk for recurrence

Table 2. Percentage of Preterm Deliveries and Low-Birth-Weight Newborns in the Second Pregnancy by Maternal Race, Outcome of First Pregnancy, and Date of Second Delivery in Georgia, 1980-1995*

Women's Race	Length of Gestation or Birth Weight		Percentage of Preterm Deliveries or Low-Birth-Weight Newborns by Year of Delivery			Overall (95% CI)
	First Delivery	Second Delivery	1980-1984	1985-1989	1990-1995	
White (n = 1023)	20-31 wk	20-31 wk	8.9	9.9	6.8	8.2 (6.6-10.1)
Black (n = 1084)			18.6	13.9	11.5	13.4 (11.4-15.6)
White (n = 1023)	20-31 wk	32-36 wk	15.3	20.0	21.8	20.1 (17.7-22.8)
Black (n = 1084)			16.2	23.7	25.4	23.4 (20.9-26.1)
White (n = 1202)	<1500 g	<1500 g	5.1	7.3	6.8	6.7 (5.3-8.2)
Black (n = 1222)			11.5	13.6	11.0	12.0 (10.3-14.0)
White (n = 1202)	<1500 g	1500-2499 g	12.3	14.6	13.3	13.6 (11.7-15.7)
Black (n = 1222)			20.7	21.4	21.7	21.4 (19.2-23.9)
White (n = 7793)	32-36 wk	20-31 wk	3.0	1.9	1.6	1.9 (1.7-2.2)
Black (n = 7793)			4.9	3.8	3.5	3.8 (3.4-4.2)
White (n = 7793)	32-36 wk	32-36 wk	15.2	15.2	15.1	15.2 (14.4-16.0)
Black (n = 7793)			21.1	21.3	20.2	20.7 (19.8-21.6)
White (n = 6774)	1500-2499 g	<1500 g	2.7	2.2	2.4	2.3 (2.0-2.7)
Black (n = 7032)			6.6	4.5	4.1	4.6 (4.1-5.1)
White (n = 6774)	1500-2499 g	1500-2499 g	18.2	16.9	15.1	15.9 (15.1-16.8)
Black (n = 7032)			25.8	21.4	21.6	22.1 (21.2-23.1)

*CI indicates exact confidence interval.

of newborns with MLBW. Black women whose first newborn had MLBW and had intervals of less than 6 months or 6 to 11 months also had moderately increased risks for recurrence of newborns with MLBW. Smoking during pregnancy was associated with reduced risk of recurrence among white women whose first newborn had MLBW. Finally, the goodness-of-fit of most of the models was reasonable.

Preterm Delivery in the Second Pregnancy and Recurrence

Among preterm deliveries in the second pregnancy, 19.9% of those for white women and 27.6% of those for black women were preceded by a preterm delivery. In contrast, among women whose second pregnancy went to term, 6.3% of white women and 13.7% of black women had a preterm delivery in their first pregnancy. Furthermore, the percentage of second preterm deliveries preceded by a preterm delivery increased as the gestation of the second pregnancy decreased. Among women whose second delivery occurred at 20 to 31 weeks, 29.4% of white women and 37.8% of black women had a preterm delivery in their first pregnancy. For second deliveries at 32 to 36 weeks, 19.9% of those among white women and 25.9% among black women were preceded by a preterm delivery.

COMMENT

For women whose first and second deliveries resulted in singleton births, our results suggest several conclusions. Although a substantial percentage of women whose first delivery is preterm will have a second preterm delivery, most will subsequently have a term delivery. At least in Georgia, the rate of preterm delivery for second pregnancies among women whose first pregnancy was very preterm did not change from 1980 through 1995. In recent years, however, more recurrent preterm deliveries are occurring closer to term, which would reduce risks of death and severe disability. In contrast, for women who delivered their first newborns at 32 to 36 weeks, the crude rate of recurrent preterm delivery declined moderately. Also, being younger than 18 years at the second delivery may increase the odds of repeating very preterm deliveries and of having VLBW newborns. Finally, first preterm deliveries are relatively common among women whose second deliveries are very preterm (29% for white women and 38% for black women).

Many of the strengths and weaknesses of our findings relate to the vital records data from which they derive. The pop-

Table 3. Odds Ratios for Recurrence of Preterm Delivery or Low-Birth-Weight Newborn by Race in Georgia, 1980-1995*

Maternal Characteristics in Second Pregnancy	Delivery at 20-31 wk†		Birth Weight <1500 g‡		Delivery at 32-36 wk†		Birth Weight 1500-2499 g‡	
	White (n = 84)	Black (n = 145)	White (n = 80)	Black (n = 147)	White (n = 712)	Black (n = 1059)	White (n = 1078)	Black (n = 1556)
Maternal age, y								
10-17	2.3 (0.9-5.6)	2.0 (1.2-3.5)	2.7 (1.0-7.2)	1.8 (1.0-3.3)	1.3 (0.8-2.0)	1.3 (1.1-1.7)	1.8 (1.2-2.6)	1.5 (1.2-1.8)
18-19	1.0 (0.5-2.0)	1.2 (0.8-2.0)	0.8 (0.3-2.1)	1.1 (0.6-2.0)	1.3 (1.0-1.7)	1.2 (1.0-1.4)	1.2 (1.0-1.6)	1.1 (0.9-1.3)
20-49	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Initiation of prenatal care (trimester)								
First	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Second, third, or none	1.2 (0.6-2.2)	1.2 (0.8-1.7)	0.9 (0.4-2.0)	0.8 (0.5-1.3)	1.1 (0.9-1.4)	1.1 (1.0-1.3)	1.1 (0.9-1.4)	0.9 (0.8-1.0)
Father's name on both birth certificates								
Present	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Absent	1.1 (0.6-2.0)	1.3 (0.8-2.0)	1.1 (0.5-2.3)	1.6 (1.0-2.5)	0.8 (0.6-1.0)	1.1 (1.0-1.3)	1.2 (1.0-1.4)	1.1 (1.0-1.3)
Year of birth								
1980-1984	1.1 (0.5-2.2)	1.5 (0.9-2.5)	0.9 (0.4-2.1)	1.0 (0.5-1.7)	1.0 (0.7-1.2)	1.0 (0.8-1.2)	1.0 (0.8-1.3)	1.1 (0.9-1.3)
1985-1989	1.5 (0.9-2.4)	1.3 (0.9-2.0)	1.4 (0.8-2.4)	1.4 (0.9-2.1)	1.0 (0.8-1.2)	1.0 (0.9-1.2)	1.0 (0.9-1.1)	0.9 (0.8-1.1)
1990-1995	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Interpregnancy interval, mo								
<6	1.1 (0.5-2.1)	1.4 (0.9-2.3)	1.3 (0.5-2.5)	1.4 (0.8-2.4)	1.0 (0.7-1.3)	1.2 (1.0-1.5)	1.1 (0.8-1.5)	1.5 (1.2-1.8)
6-11	1.6 (0.9-2.9)	0.9 (0.5-1.5)	1.1 (0.5-2.2)	1.2 (0.7-2.1)	1.2 (0.9-1.5)	1.1 (0.9-1.3)	1.2 (1.0-1.5)	1.3 (1.1-1.5)
12-47	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
>47	1.0 (0.4-2.1)	0.8 (0.4-1.5)	1.9 (0.9-4.2)	0.7 (0.4-1.5)	0.9 (0.7-1.2)	0.7 (0.6-0.9)	1.3 (1.1-1.6)	1.0 (0.9-1.3)
Goodness-of-fit *P* value§	.72	.33	.93	.96	.29	.93	.46	.42
Smoking during pregnancy‖								
Yes	0.4 (0.2-1.1)	1.7 (0.2-14.5)	0.4 (0.2-1.3)	0.4 (0.1-1.8)	0.8 (0.6-1.2)	0.6 (0.3-1.1)	0.6 (0.4-0.8)	0.6 (0.4-1.0)
No	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

*Odds ratios for type of second pregnancies are controlled for all of the other variables in the table except smoking; figures in parentheses are 95% confidence intervals.
†Referent group is delivery in second pregnancy at gestation ≥37 weeks.
‡Referent group is delivery in second pregnancy of a newborn weighing ≥2500 g.
§Goodness-of-fit for model including all variables except smoking.
‖Analysis restricted to second deliveries occurring from 1989 through 1995. Association adjusted for all other variables in the model.

ulation-based nature of vital records reduced the potential selection bias that is often a concern with clinically based data. Furthermore, the large number of women studied permitted analysis of numerous subgroups; of note are our data analyses for black women, who generally have a high rate of preterm delivery. Conversely, clinically based data, which typically include many fewer women, offer a richness of detail and level of accuracy that are not available from vital records. For example, vital records do not permit a distinction between spontaneous and medically indicated preterm births, an important difference because risk of recurrence has been shown to vary between these categories.[9] In addition, legitimate concerns have been raised about the accuracy of data about gestational length on birth certificates.[10,11] By editing the data to exclude implausible gestational lengths, we may have introduced bias because we excluded a greater proportion of women who delivered low-birth-weight newborns than women who delivered normal-birth-weight newborns. That most of our parallel analyses of birth weight had findings similar to our length-of-gestation analyses, however, lends credibility to the analyses based on length of gestation.

Because we only had data for births in Georgia from 1980 through 1995, we necessarily excluded women whose first or second pregnancy occurred before or after the study period or in another state. We do not know how these exclusions and omissions may have influenced the findings. Evaluation of the pregnancy histories in the database, however, showed them to be complete.[4]

Our results confirm past observations that women whose first pregnancies resulted in preterm deliveries have increased risks of preterm deliveries in their second pregnancies.[12,13] Our results also confirm that teenagers, especially young black teenagers, have a high rate of recurrence of preterm delivery.[14] Finally, our results also show a relationship between degree of preterm delivery in the first pregnancy and likelihood of preterm delivery in the second.[15-17] By examining the gestational-length distribution in the second pregnancy, we show that women whose first newborns were delivered at 20 to 31 weeks have increased risks for preterm delivery in the second birth, especially for delivery at 20 to 31 weeks. The risk of recurrent preterm delivery appears not to have changed during the study years, despite the increase in preterm delivery that has been observed in the United States and Canada.[1,18,19]

Recent reports suggest that short cervical length, the detection of fetal fibronectin, and bacterial vaginosis during pregnancy increase the risk of spontaneous preterm delivery.[20-22] Because cervical length is a constitutional factor that persists within an individual, women with a short cervix likely face a high risk of preterm delivery in all their pregnancies. In contrast, the other 2 risk factors may not have the same persistence. Other promising findings suggest that interventions during pregnancy can reduce the recurrence of preterm delivery.[2] Although women who have experienced 1 singleton preterm delivery clearly have increased absolute risks and RRs for a second singleton preterm birth, most of these women will deliver their next newborns at term. Young teenagers may prove an exception, at least among those whose first delivery was very preterm (20-31 weeks). In this group, we found that among those younger than 18 years at their second delivery, 41.5% of white teenagers and 48.6% of black teenagers delivered preterm.

The etiology of preterm delivery remains elusive.[2] Whether recurrent preterm deliveries share the same etiology as incident preterm deliveries is unknown. Because a substantial percentage of preterm deliveries in second pregnancies are associated with recurrence, additional research is needed to identify the causes of recurrence.

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