



PRAMS and . . .

Preterm Delivery

Preterm delivery, the birth of an infant prior to 37 completed weeks of gestation, is one of the leading causes of illness and death among newborns.¹ Preterm births have increased 14% in the United States since 1990, growing from 10.6% of all U.S. births to 12.1% by 2002.² This increase may be due in part to the rise in the average maternal age at first birth, greater numbers of multiple-infant births, and changes in clinical practice.^{1,3} Preterm delivery is a growing public health concern for both women and infants, and one objective of *Healthy People 2010* is to reduce the proportion of preterm deliveries to 7.6% of all U.S. births.⁴

What is known about Preterm Delivery?

Maternal race, age, weight, weight gain during pregnancy, income, previous preterm delivery, infection, and stress are all associated with preterm delivery.⁵⁻⁷ Despite the identification of various risk factors, only about 50% of women who experience preterm delivery have an identifiable risk factor.⁵ In an effort to fill this gap in knowledge about preterm delivery, other factors that may be associated, such as genetics and inflammatory responses, are currently being explored.

Studies have shown that more than 50% of infants born at 34 weeks of gestation were admitted to the neonatal intensive care unit (NICU), and the average duration of hospital stay was 4 days for infants with no complications.⁸ Preterm deliveries, especially those resulting in admittance

to the NICU, take a toll on the entire family, both financially and emotionally. Preterm infants often experience long-term health problems, which could include lung disease, cerebral palsy, learning disabilities, and vision and hearing impairments.⁹ Each year, hospital care for preterm infants exceeds \$13 billion.¹⁰

What is PRAMS?

The Pregnancy Risk Assessment Monitoring System is an ongoing state-specific, population-based surveillance system of maternal behaviors and experiences before, during, and after pregnancy. Sponsored by the Centers for Disease Control and Prevention, PRAMS was developed to supplement vital records data by providing state-specific data to be used for planning and evaluating perinatal health programs. PRAMS operates in 37 states, New York City, and the South Dakota Tribal-State collaborative project. PRAMS represents approximately 75% of all U.S. births.

PRAMS and Preterm Delivery

The Pregnancy Risk Assessment Monitoring System (PRAMS) has data on maternal demographics, Medicaid status, plurality, previous birth experience, maternal morbidity, pre-pregnancy weight, and stress that were used to analyze the characteristics of women who experienced preterm delivery. In 2001, 22 states representing 42% of U.S. births (Alabama, Alaska, Arkansas, Colorado, Florida, Hawaii, Illinois, Louisiana, Maine, Maryland, Michigan, Nebraska, New Mexico, New York,* North Carolina, Ohio, Oklahoma, South Carolina, Utah, Vermont, Washington, and West Virginia) collected data on preterm delivery. Questionnaire and birth certificate data were used to obtain information on maternal characteristics and behaviors, demographics, and clinical experiences.

PRAMS Data on Preterm Delivery

In the 22 states in 2001, 36,821 women who participated in the PRAMS survey gave birth to a live infant; 9,662 (9.8%) of these births were preterm. By state, the percentage of respondents who experienced preterm delivery ranged from 6.2% to 12.6% (Figure 1).

* Does not include New York City

Maternal Demographics

Black mothers experienced preterm deliveries more often than white mothers or mothers of other racial/ethnic groups (14.7%, 8.7%, and 10.7%, respectively). The percentage of black mothers who gave birth to a preterm infant varied by state, ranging from 6.3% to 22.3% (Table 1). Mothers with the highest percentage of preterm delivery were under 18 years of age or 35 and older (11.7% and 11.4%), had less than 12 years of education (12.2%), received Medicaid (11.9%), or had multiple-infant pregnancies (62.8%). Among mothers who received Medicaid, the prevalence of preterm delivery ranged from 5.7% to 12.3% (Table 1).

Risk Factors

Mothers who had a previous preterm birth (25.9%) or previous low-birth-weight infant (21.3%) were more likely than those without a previous poor birth outcome to experience preterm delivery (Table 1). Mothers who had a pregnancy-related complication requiring one night or more of hospitalization prior to delivery (37.8%) were also more likely than those without a pregnancy-related complication (6.1%) to experience preterm delivery. State prevalence estimates of hospitalizations before delivery ranged from 30.4% to 49.1% (Table 1).

Pre-pregnancy weight was associated with preterm delivery—mothers with a body mass index (BMI) of less than 18.5 experienced the highest percentage (11.5%). Those with self-reported partner-related, financial, or traumatic stress (e.g., being homeless, having a problem with drinking or drugs) were also more likely to experience preterm delivery (Table 1).

Preterm Delivery Surveillance and PRAMS

Surveillance led to the emergence of preterm delivery as a growing concern for the health of women and infants. The continued monitoring of preterm delivery will enable researchers and public health practitioners to learn more about the women who are at risk and to evaluate intervention and prevention efforts.

PRAMS is important because it provides state-specific information on preterm delivery and maternal characteristics. These data help states identify specific risk factors and behaviors associated with preterm delivery, enabling them to tailor prevention efforts to specific populations. PRAMS data are essential for answering questions that future research may explore about the associations and outcomes of preterm delivery for both women and infants.

Figure 1. Prevalence of Preterm Delivery by PRAMS States, 2001

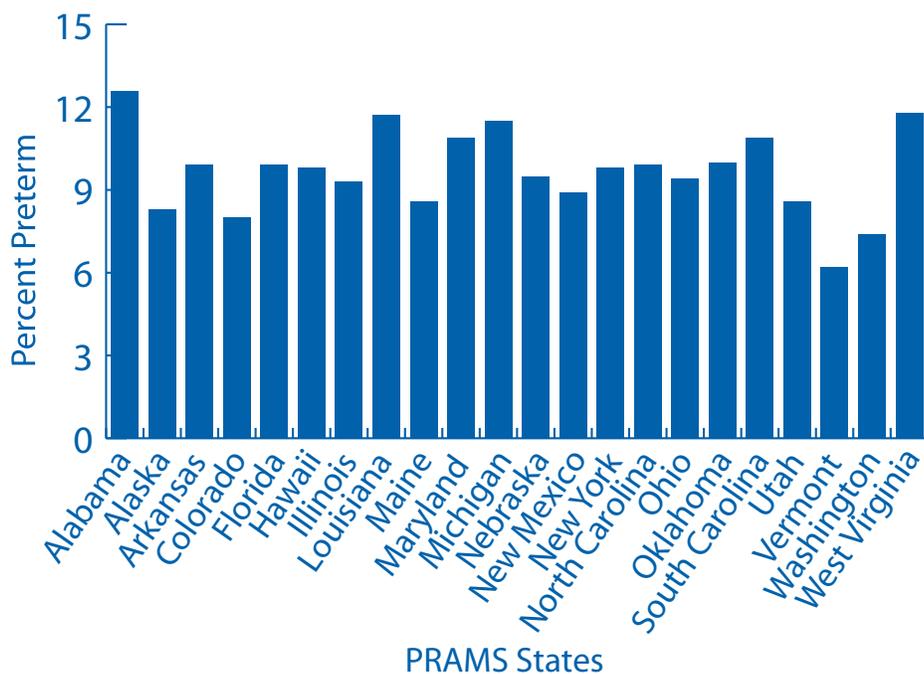


Table 1. Preterm Delivery by Selected Maternal Characteristics in 22* PRAMS States, 2001

Characteristic	% Preterm	% Not Preterm	P-value [†]	Prevalence (%) Range	State with lowest value	State with highest value
Maternal Demographics						
Race			<0.0001			
White	8.7	91.3		(6.3%, 11.5%)	Vermont	West Virginia
Black	14.7	85.3		(6.3%, 22.3%)	Hawaii	Michigan
Other	10.7	89.3		(0%, 22.9%)	Vermont	West Virginia
Age group, years			0.0006			
<18	11.7	88.3		(4.2%, 17.8%)	Washington	Alabama
18-25	10.4	89.7		(6.2%, 13.6%)	Washington	Michigan
26-34	9.1	90.9		(6.0%, 13.2%)	Vermont	Alabama
≥ 35	11.4	88.6		(5.6%, 17.1%)	Vermont	West Virginia
Education, years			0.0013			
<12	12.2	87.8		(7.2%, 18.0%)	Colorado	Ohio
12	9.9	90.1		(5.4%, 14.1%)	Washington	Alabama
>12	10.0	90.0		(6.3%, 17.5%)	Vermont	Maryland
Medicaid recipient[‡]			<0.0001			
Yes	11.9	88.1		(5.7%, 12.3%)	Vermont	West Virginia
No	8.7	91.3		(7.0%, 15.2%)	Vermont	Alabama
Multiple Birth			<0.0001			
Yes	62.8	37.2		(5.7%, 11.8%)	Vermont	Alabama
No	9.1	90.9		(41.1%, 92.9%)	Washington	West Virginia
Risk Factors						
Previous preterm birth			<0.0001			
Yes	25.9	74.1		(16.3%, 39.2%)	Hawaii	Michigan
No	7.4	92.6		(5.2%, 9.8%)	Maine	Maryland
Previous low-birth-weight birth			<0.0001			
Yes	21.3	78.7		(9.9%, 28.2%)	Hawaii	Michigan
No	8.3	91.7		(4.4%, 10.4%)	Vermont	West Virginia
Maternal morbidity requiring ≥1 night hospitalization[§]			<0.0001			
Yes	37.8	62.2		(30.4%, 49.1%)	Vermont	Utah
No	6.1	93.9		(3.5%, 8.0%)	Vermont	Alabama
Pre-pregnancy weight, BMI[¶]			0.007			
<18.5	11.5	88.5		(6.0%, 21.3%)	Alaska	North Carolina
18.5-24.9	10.0	90.0		(6.2%, 12.0%)	Vermont	Louisiana
25-29.9	8.9	91.1		(5.1%, 13.6%)	Vermont	West Virginia
≥30	10.3	89.7		(6.4%, 13.7%)	Colorado	Alabama
Stress during pregnancy[#]						
Emotional			0.53			
Yes	10.1	89.9		(7.3%, 13.9%)	Vermont	West Virginia
No	9.9	90.2		(5.7%, 13.4%)	Vermont	Alabama
Partner-related			0.0001			
Yes	11.1	88.9		(6.8%, 15.0%)	Vermont	Maryland
No	9.3	90.7		(6.0%, 12.0%)	Vermont	Alabama
Financial			<0.0001			
Yes	10.7	89.3		(7.2%, 13.9%)	Vermont	Alabama
No	9.0	91.0		(5.3%, 11.9%)	Vermont	Michigan
Traumatic			0.028			
Yes	10.9	89.1		(6.5%, 13.9%)	Colorado	Alabama
No	9.7	90.3		(6.0%, 12.3%)	Vermont	Alabama

* States included are Alabama, Alaska, Arkansas, Colorado, Florida, Hawaii, Illinois, Louisiana, Maine, Maryland, Michigan, Nebraska, New Mexico, New York (not including New York City), North Carolina, Ohio, Oklahoma, South Carolina, Utah, Vermont, Washington, and West Virginia.

† P-value < .05 for the Chi Square test indicates significant statistical difference between the percentages of characteristics among those with a preterm delivery compared with those who did not have a preterm delivery.

‡ A Mother who reported that she was receiving Medicaid when she became pregnant or that Medicaid paid for her prenatal care or delivery.

§ Pregnancy-related complications that require a hospital stay of ≥ 1 day. Pregnancy-related complications are defined as any of the following conditions: preterm labor; high blood pressure; edema; vaginal bleeding; abruptio placentae; placenta previa; severe nausea, vomiting, or dehydration; diabetes; kidney or bladder infection; premature rupture of membranes; or incomplete cervix or cerclage.

¶ BMI = body mass index.

The four types of stress were defined as follows: emotional—a very sick family member had to go into the hospital or someone close to the respondent died; partner-related—the respondent separated or divorced from her husband/partner, she argued more than usual with her husband/partner, or her husband/partner said he didn't want her to be pregnant; financial—the respondent moved to a new address, her husband/partner lost his job, she lost her job, or she had a lot of bills she couldn't pay; traumatic—the respondent was homeless, she was involved in a physical fight, she or her husband/partner went to jail, or someone close to her had a problem with drinking/drugs.

Building on Research

Certain pre-pregnancy characteristics of women, such as history of previous preterm delivery and low BMI, are associated with preterm delivery.¹¹⁻¹³ Experiences during pregnancy may also increase a woman's risk for preterm delivery. For example, stress has been thought to increase a woman's risk for preterm delivery; however, epidemiologic investigations have shown inconsistent results.¹⁴ More research on stress and its biological mechanisms during pregnancy may help improve our understanding of the effects of stress on pregnancy and possible interventions that would promote stress reduction.

More research is needed to help us understand the racial disparities associated with preterm delivery. African Americans have higher rates of preterm birth than any other racial or ethnic group,¹¹ and preterm delivery is the *leading* cause of death for African American infants.¹⁰

Genetics may play a part in preterm birth, as evidenced by the increased risk for mothers with previous preterm infants and among sisters and children in the same family.⁵ Other possible factors that may increase the risk of preterm delivery include Assisted Reproductive Technology (ART) and inflammatory responses; however, more research is needed to examine these relationships.¹⁰

Future research on the early identification of women at high risk and the evaluation of interventions are needed to help discover the complexities of preterm birth and how it can be prevented.

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How can I learn more?

For additional information or to obtain copies of this publication, write or call the Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health, 4770 Buford Highway, NE, Mail Stop K-22, Atlanta, Georgia 30341-3717; telephone: (770) 488-6260. Internet: <http://www.cdc.gov/prams>.