

## The Association between Mother's Age at First Birth and Education

One of the most important elements of economic success in adult life is education. For most of the population on welfare, a high school education decreases the likelihood of long-term welfare dependency<sup>1</sup> and, ultimately, can reduce cost to the government. For women who become mothers before completing high school, future educational attainment can be stifled or even ended.<sup>2,3,4</sup>

Besides interrupting a woman's education, early childbearing is associated with numerous adverse outcomes. Young teen mothers are at an increased risk of delivering low birth weight (< 2500g) and/or preterm (< 37 weeks gestation) births, experiencing physical violence, and living in poverty.<sup>3,5,6</sup> Further, one limited study has shown that children of young teen mothers are more likely to have lower educational attainment, more male juvenile delinquency, and teenage pregnancies.<sup>2</sup>

While most studies agree that early childbearing limits or delays future educational achievement, the impact of other factors on education is not clear.<sup>7</sup> Some research has shown that factors such as race and socio-economic status are strongly associated with completing high school.<sup>4,7</sup> Other findings indicate that family or personal factors, such as attitudes, are more influential.<sup>7</sup> Since teen childbearing is potentially preventable, we focused on the relationship between early childbearing and education while controlling for other factors.

### Methods and Materials

In an effort to look at long-term educational repercussions of early childbearing, only women with a previous birth are included in this analysis. This represents 58.5% of all mothers giving birth between April 1990 and March 1994 (Figure 1). By focusing on women with at least one previous birth, we are able to study how the timing of their first child was associated with their current level of education. To determine the mother's age at the birth of her first child, new mothers were asked specifically, "How old were you when you had your first baby?"

For this analysis, women less than 18 years of age at the time of questionnaire completion were excluded since, in general, they would not have had the opportunity to complete high school. Respondents were divided into three groups based on their age at first birth: young teens ( $\leq 17$ ), older teens (18-19), and non-teens ( $\geq 20$ ). All of the variables examined and conclusions drawn in this report are based on data obtained from the mother of the infant sampled for PRAMS, hereafter referred to as the PRAMS birth.

Tests for differences between proportions were performed using the chi-square test for association. The relationship between age at first birth and high school education was examined using logistic regression. This statistical procedure produces estimates of the odds ratio for not finishing high school, comparing teens at first birth to non-teens at first birth, while adjusting for other factors.

### In Oklahoma

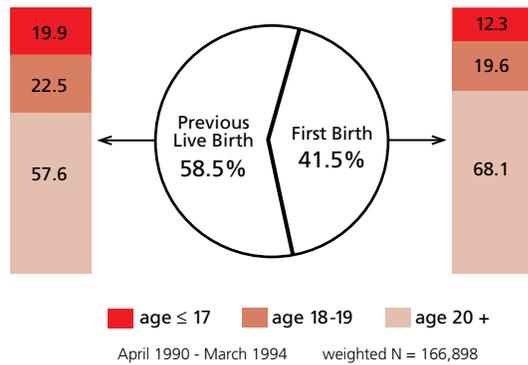
Among new mothers aged 18 or older with at least one previous birth...

- 1 in 6 women had their first child before age 18.
- 1 in 3 women had their first child before age 20.
- 1/2 of women younger than 18 at the birth of their first child have *not* graduated high school.
- young African American teens are 3 times more likely to have graduated high school at a subsequent birth than whites or Native Americans.
- young teen mothers are 10 times more likely *not* to have graduated high school at a later delivery than first time mothers age 20 or older.
- first time mothers age 18 or 19 are 4 times less likely to finish high school at a later birth than those age 20 or older.

### General Characteristics

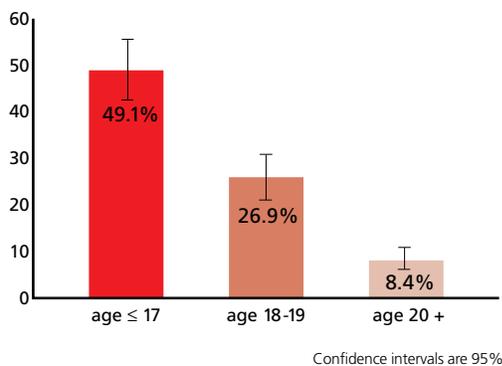
Teen pregnancy is a widespread problem in Oklahoma (Figure 1). Every year close to 6,000 teens aged 19 and younger give birth for the very first time (more than 2,000 aged 17 and younger). Among all Oklahoma women who gave birth between April 1990 and March 1994, 1 in 6 had their first child before age 18, and approximately 1 in 3 gave birth before age 20.

Figure 1: Oklahoma Mothers Grouped by Parity and Age at First Birth



As discussed previously, teen pregnancy has been shown to be a major hurdle to completing high school.<sup>2,3,4</sup> An interesting pattern can be seen upon comparison of the percentage of non-graduation from high school among the three age groups (≤17, 18-19, 20+). For women with a previous birth, 49.1% of those aged 17 or younger at their first birth had not yet graduated high school at the time of the birth sampled for this report, as compared to 8.4% of those age 20 or older at their first birth (Figure 2).

Figure 2: Non-Graduates of High School Grouped by Age at First Birth



Through prior analyses of PRAMS data, many factors have been suggested as possible influences on educational opportunities for women. Table 1 shows the factors examined in this analysis. They include age at first birth, time between first and PRAMS birth, mother's race, income source, urban/rural residence, number of births (parity), intention of pregnancy, and marital status at conception all at the PRAMS birth.

Table 1: Non-Graduates of High School at Current Birth by Maternal Characteristics

Characteristic	% Non-Graduates	Std Err	p-value
Age at First Birth			
≤ 17	49.1	[3.6]	< .0001
18-19	26.9	[2.7]	
20+	8.4	[1.0]	
Time Since First Birth			
< 5 years	16.7	[1.6]	.0389
5-9 years	21.0	[2.1]	
10+ years	24.5	[2.9]	
Parity <sup>1</sup>			
2	15.4	[1.5]	.0005
3+	25.1	[2.0]	
Income Source			
Job/Business	13.1	[1.1]	< .0001
Welfare	35.9	[2.8]	
Race			
White	19.9	[1.3]	.1222
African American	12.0	[3.7]	
Native American	24.4	[4.3]	
Geographic Location			
Urban [> 20,000]	16.6	[1.5]	.0033
Rural [<20,000]	23.5	[1.8]	
Marital Status <sup>2</sup>			
Unmarried	30.3	[2.9]	< .0001
Married	16.2	[1.2]	
Intention			
Unwanted	25.5	[3.3]	.1197
Mistimed	18.2	[2.2]	
Intended	18.0	[1.6]	

<sup>1</sup> Includes PRAMS birth

<sup>2</sup> Marital Status at the time of conception of the PRAMS birth

PRAMS is a population-based survey of Oklahoma women with a recent delivery. Analysis weights were applied to adjust for selection probability and non-response. By using weighted analysis, researchers can make strong statements about the preconception and perinatal periods for the entire population of women in Oklahoma delivering a live birth. Thus, state-specific decisions on policy and program development can be made. A stratified systematic sampling approach is used to select approximately 200 new mothers each month from the state's live registry. Up to three mailed questionnaires are used to solicit a response. Telephone interviews are attempted for non-respondents. Data for this report reflect live births occurring between April 1990 and March 1994. The response rate was 70%. The analysis includes information collected from 3,935 mothers with a previous live birth. All data represent state estimates.

The data clearly show that the younger the woman's age at first birth, the more likely she is to have not finished high school at the PRAMS birth — 49.1% ( $\leq 17$ ) vs 8.4% (20+) [Table 1]. Further, the more children a woman delivers or the longer the interval since her first birth, the less likely she is to have graduated from high school at the PRAMS birth. Mothers on welfare are less likely to have graduated high school (35.9%) than those whose source of income is either a job or business (13.1%). Women who are Native American (24.4%), unmarried at the conception of the PRAMS birth (30.3%), or living in a rural area (23.5%), are the least likely to have graduated at the PRAMS birth within their specific demographic group.

As seen in Table 1, age at first birth is significantly associated with graduating high school ( $p < .0001$ ). Because the percentage of non-graduates varied so dramatically by age at first birth, the data were stratified by age at first birth (Table 2).

**Table 2: Non-Graduates of High School at Current Birth by Maternal Characteristics and Age at First Birth**

Indicator	Age $\leq 17$		Age 18-19		Age $\geq 20$	
	%	Std Err	%	Std Err	%	Std Err
Time Since First Birth						
< 5 years	49.4	[6.5]	30.3	[4.2]	7.0	[1.3]
5-9 years	50.2	[5.9]	25.2	[4.7]	10.5	[2.0]
10+ years	47.6	[6.1]	23.1	[5.2]	9.5	[3.1]
Parity <sup>1</sup>						
2	54.5	[6.0]	22.4	[3.8]	7.0	[1.2]
3+	47.5	[4.7]	29.4	[3.9]	11.3	[2.1]
Income Source						
Job/Business	45.5	[5.2]	21.9	[3.1]	6.0	[1.0]
Welfare	51.1	[5.0]	36.9	[5.1]	19.5	[3.9]
Race						
White	57.0	[4.1]	27.5	[3.0]	8.9	[1.2]
African American	18.6	[7.0]	15.7*	[8.6]	1.7*	[0.7]
Native American	59.9	[10.1]	29.1	[8.9]	7.9*	[3.8]
Geographic Location						
Urban ( $>20,000$ )	41.9	[5.0]	24.2	[3.7]	7.1	[1.3]
Rural ( $<20,000$ )	57.7	[4.9]	29.5	[3.9]	10.3	[1.8]
Marital Status <sup>2</sup>						
Unmarried	44.9	[5.6]	33.6	[5.3]	15.0	[3.6]
Married	54.1	[4.6]	23.4	[3.0]	7.2	[1.0]
Intention						
Unwanted	42.0	[8.0]	31.9	[6.7]	14.1*	[3.9]
Mistimed	34.8	[6.2]	23.1	[4.9]	10.0	[2.3]
Intended	65.6	[5.1]	25.3	[3.9]	6.2	[1.2]

<sup>1</sup> Includes PRAMS birth

<sup>2</sup> Marital Status at the time of conception of the current birth

\*Cell size < 20

The differences in the percentage of non-graduates between young teens ( $\leq 17$ ) and non-teens (20+) are striking. Women who were young teens ( $\leq 17$ ) at their first birth are consistently the least

likely to have finished high school at the PRAMS birth for each demographic category examined (Table 2).

PRAMS data indicate that Oklahoma women who both discontinued their education and started a family have not completed high school ten or more years after the birth of their first child. There is virtually no difference between young teens less than 5 years since their first birth (49.4%) and those ten or more years since their first birth (47.6%).

A positive finding from our analysis revealed that young teen African American mothers ( $\leq 17$ ) are significantly more likely to graduate high school than either whites or Native Americans. In fact, they are three times more likely to graduate. More research is needed on larger groups of women to explore this finding.

### Regression Analysis

Logistic regression analysis shows that women who were 17 or younger at the birth of their first child were more than ten times as likely not to finish high school as those who were age 20 or older (Table 3). Women age 18 or 19 at the birth of their first child were four times as likely not to receive a high school diploma as those women age 20 or more. The contribution of age at first birth remained virtually unchanged by the inclusion of the other variables.

**Table 3: High School Crude and Adjusted Odd Ratios**

Age at First Birth	Crude Odds Ratio	(95% CI)	Adjusted Odds Ratio*	(95% CI)
$\leq 17$	10.5	(7.1, 15.4)	10.1	(6.1, 16.7)
18-19	4.0	(2.7, 5.8)	3.5	(2.2, 5.4)
20+	1.0		1.0	

\* Adjusted for age at first birth, race, income source, parity, intention of pregnancy, geographic location, time elapsed since first birth, and marital status at time of conception all collected at the PRAMS birth.

### Discussion/Conclusions

Of the factors tested in this report, age at first birth was clearly the most strongly associated with educational attainment. High school completion can be severely limited by early childbirth. Early child-bearing has also been associated with a number of other adverse outcomes including low birth weight, preterm birth, and late or no prenatal care.<sup>3,5,6</sup> Further, long-term negative consequences of early childbearing include increased risks for

physical violence, divorce or separation, and living in poverty at the birth of a later child.<sup>5,6</sup> Whether these long-term consequences result from the mother's decreased education, her early childbearing, or a combination of several factors is unclear, but increased education of the mother corresponds to increased educational attainment for her children.<sup>2</sup>

Although a strong association was found between teenage childbearing and non-graduation from high school, this study is not without limitations. First, only women with two or more births were included in this analysis. Subsequent educational attainment by women with just one birth is currently unavailable and could not be considered. Second, no information was available concerning the characteristics of the mother at her first birth except for her age and race. All other variables used in this study reflect the situation of the mother at the PRAMS birth. Finally, it is recognized that women may yet complete their education. Furstenberg showed that the percentage of teen mothers who were not high school graduates decreased from 49% to 32% by 17 years after their first baby's birth.<sup>2</sup>

Clearly, steps can be taken to reduce early childbearing. Communities should develop local partnerships to identify specific community needs and implement proven, age-appropriate interventions to prevent early sexual activity for males and females. These local programs should provide opportunities to teach all youth age-appropriate, medically accurate sexuality education that stresses the value of delayed sexual activity and childbearing. Accessible family planning services should be available for those who are sexually active. Health education and sexuality education training should be a community priority for parents, teachers, counselors, health professionals, church and youth group leaders, as well as other adults who work directly with the school-age population. Community leaders and concerned citizens should engage local print and electronic media in a campaign to prevent teen pregnancy.

For those women who do become pregnant at an early age, educational opportunities need to be stressed in order to improve the future for themselves and their children. Health professionals should provide counseling, as a part of early prenatal care, to motivate and assist teens to remain in school and to advise these teenagers of the need

for family planning services after delivery. Communities should encourage teens to complete their education by offering alternative educational programs as well as on-site child day care services, real life skill courses in parenting, money management and job training skills.

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