

Pregnancy Wantedness and Adverse Pregnancy Outcomes: Differences by Race and Medicaid Status

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The relationship between pregnancy wantedness and adverse pregnancy outcomes was studied using data from 2,828 mothers who participated in the Missouri Maternal and Infant Health Survey. The wantedness of a pregnancy was measured using traditional classifications of mistimed and unwanted, as well as additional measures gauging how the woman felt about the pregnancy while she was pregnant. Fifty-eight percent of the very low birth weight infants and 59% of the moderately low birth weight infants resulted from unintended pregnancies, as did 62% of the normal-birth-weight infants. Logistic regression showed that mothers of very low birth weight infants were significantly more likely than those who had a normal-weight baby to report that they had felt unhappy about the pregnancy (odds ratio of 1.53). Very low birth weight was also associated with early denial of the pregnancy (1.54). Odds ratios associating these two unwantedness categories with low-birth-weight babies were higher among Medicaid recipients than among women not receiving Medicaid. Associations between very low birth weight and the denial variable were also significant among white women when very low birth weight outcomes were compared with normal outcomes, but there was no significant association among black women. There were no significant associations between low birth weight and the traditional unwantedness variables.

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While there have been notable improvements in U.S. infant mortality and morbidity rates over the past decade, the United States still lags behind most other industrialized countries, having much higher levels of infant mortality.¹ Rates of low birth weight, which had been stable, have increased over the last decade,² and large racial disparities persist: Black women have twice the risk of delivering a low-birth-weight infant as white women have, and black infants are twice as likely as white infants to die before their first birthday.³ Further, disorders related to short gestation and low birth weight represent the leading cause of death among black infants,⁴ and are the third leading cause of infant mortality overall. These racial disparities persist

even when the effects of socioeconomic and behavioral factors—such as income, education, adequacy of prenatal care and harmful habits—are taken into account.⁵

In addition, despite the wide selection of safe and effective contraceptive methods and extensive dissemination of contraceptive information, unwanted pregnancy remains an important U.S. public health problem. More than half of the six million pregnancies occurring in 1988 in the United States were unplanned; 1.6 million of these pregnancies ended in an abortion and 1.5 million were carried to term.⁶ Among live births in 1988, 28% were mistimed and 12% were unwanted at the time of conception.⁷

Unintended pregnancies account for a substantial proportion of all births, and are particularly common among young, unmarried women. Data from the 1988 National Survey of Family Growth (NSFG) revealed that between 1983 and 1988, 87% of births to 15–19-year-old never-married women and 69% of births to 20–24-year-old never-married women were unwanted or mistimed.⁸ The possible negative effect on birth outcomes of unintended pregnancy is of special concern in regard to young, unmarried, low-income women, who are at greater risk of low birth weight than other women.⁹

Research has indicated that ambivalence toward pregnancy is a barrier to early and continuous prenatal care. Women with a mistimed or unwanted pregnancy are less likely than those with a wanted pregnancy to initiate early prenatal care and to make an adequate number of visits.¹⁰ However, until recently, the relationship between pregnancy wantedness and adverse pregnancy outcome has received little attention; increasingly, though, public health officials are examining the impact of unintended childbearing on the incidence of low birth weight and infant mortality. One recent study found that women who indicated in an early prenatal visit that their pregnancy was unwanted or mistimed were more than twice as likely as other women to deliver an infant who died within 28 days of birth.¹¹

In this article, we examine the relationship between adverse pregnancy outcomes and variables measuring unintended (mistimed and unwanted) pregnancy. We hypothesized that women who delivered low-birth-weight infants would have reported higher levels of unintended pregnancy than women who delivered normal-weight infants.

Methods

Study Population

In this article, we use data collected in the Missouri Maternal and Infant Health Survey (MMIHS). The survey, conducted with assistance from the National Institute of Child Health and Human Development (NICHD), was designed as a population-based case-control study of very low birth weight infants (those weighing less than 1,500 g) born to Missouri residents between December 1, 1989, and March 31, 1991. (A detailed description of the study methodology has appeared elsewhere.¹²) All multiple pregnancies were excluded to make the analysis more straightforward. Among singleton births, moderately low birth weight infants (those weighing 1,500–2,499 g) and infants of normal birth weight (those weighing 2,500 g or more) served as controls. Stillbirths (fetal deaths at 20 or more weeks' gestation) were also included in the data.

Original plans called for one method of

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data collection only—mailing the survey instrument to new mothers. However, in a pilot study, the response rate for women who had delivered at five major urban hospitals was very low. The researchers then decided to interview women postpartum in these hospitals (two in St. Louis, one in Kansas City, one in central Missouri and one in southwestern Missouri). Missouri residents who delivered elsewhere had questionnaires mailed to them three months postpartum; these women were identified through birth or fetal death certificates. Each respondent was compensated \$15 for her participation.

The women completing the in-hospital questionnaire made up 36% of the study population and 39% of all completed surveys. Table 1 presents the proportions of women responding (and their response rates) by selected maternal characteristics. (The N for the table includes the 274 women who had a multiple pregnancy, who were subsequently dropped from the analysis.) Almost 38% of the mothers were black and 62% were white;* 23% were teenagers, 54% were in their 20s and 23% were age 30 and older. More than half (52%) of the mothers were married and nearly the same proportion (53%) lived in a major metropolitan area. While one-third of the women had not finished high school, another third had had some college. Slightly fewer than half of the mothers in the sample qualified for Medicaid (45%), a proportion that is consistent with that for all women giving birth in Missouri. Medicaid recipients were more likely to be black (55%) than white (45%) (not shown).

The overall response rate for the survey, regardless of administration, was 76%, with a 12% refusal rate and a 12% nonresponse rate. Response rates were fairly similar among subgroups by race, age, level of education, marital status, geographic area and Medicaid status. However, the response rate among women interviewed in the five major hospitals was higher than that for women responding by mail (84% vs. 71%).

Cases consisted of all very low birth weight babies born in the state over the period; the next moderately low birth weight and normal-birth-weight infants that matched on race and maternal age served as controls. In addition, all fetal deaths occurring over the period were included in the data set.

Thus, data on pregnancy outcome were available for 2,828 women with singleton pregnancies—779 who gave birth to a very low birth weight infant, 799 whose infant was of moderately low birth

weight, 800 who gave birth to a normal-birth-weight baby and 450 whose baby died in utero. For the in-hospital interviews, control mothers were selected and stratified by race (black vs. white) and age (younger than 20 years, 20–24, or 25 years or older). For the mailed questionnaires, on the other hand, controls were acquired using frequency matching with the addition of rural-urban area of residence (major metropolitan areas of St. Louis and Kansas City vs. the rest of Missouri) as a matching variable.

Variables

We examined pregnancy outcome and its relationship to pregnancy wantedness using traditional definitions of mistimed and unwanted pregnancies[†] derived from the NSFG and other national surveys,¹³ as well as additional measures of wantedness. We included these newer measures both to test their strength and to address some of the weaknesses of the traditional approach.

The newer measures are more sensitive to a woman's feelings about being pregnant than the traditional measures, which ask only about pregnancy timing. Respondents were asked, "How did you feel about being pregnant during your recent pregnancy?" Their response was measured on a four-point Likert-type scale anchored by answers of "very happy" and "very unhappy." Women were also asked whether they had experienced any of a list of barriers to prenatal care. Included in this list were "I wasn't sure I wanted to be pregnant," "I didn't want people to know I was pregnant," "I didn't want to think about being pregnant," and "I didn't know I was pregnant."

We included these direct questions in the analysis as measures of how subjects felt about their pregnancy. Extending our measure of pregnancy wantedness in this way allowed a more complete investigation of the relationship between pregnancy wantedness and birth weight, as well as other important outcome variables connected to wantedness.

We used six independent variables related to pregnancy wantedness. The first variable, *unintended pregnancy*, combines both subsets of pregnancies that were reported as *mistimed* or *unwanted*. The second, the traditionally labeled *mistimed pregnancy* variable, refers to the pregnancies of women who indicated that they did not want to become pregnant at the time they conceived, but wanted to be pregnant at some time in the future. The third variable, traditionally called *unwanted pregnancy*,

Table 1. Percentage distribution and survey response rates of women giving birth in December 1989–March 1991, by maternal characteristics, Missouri Maternal and Infant Health Survey

Characteristic	% (N=3,102)†	Response rate (%)
Race		
Black	37.8	73.1
White‡	62.2	77.2
Age (in years)		
10–19	22.7	79.6
20–24	28.5	77.4
25–29	25.3	74.4
≥30	23.4	71.7
Education (in years)		
<12	30.1	75.5
12	40.0	75.3
13–15	17.9	75.8
≥16	11.9	77.1
Marital status		
Married	52.5	76.2
Unmarried	47.5	74.9
Area of residence		
Urban	53.0	74.3
Rural	47.0	77.1
Medicaid status		
Yes	45.3	79.4
No	54.7	73.5
Type of survey		
In-hospital	39.2	83.5
Mailed	60.8	71.2
Total	100.0	75.6

†Includes 274 women with multiple pregnancies, who were later dropped from the analysis. ‡In this and subsequent tables, includes a small proportion of women belonging to minority groups other than black. Note: Eighty-seven observations are missing from the education category and 83 are missing data on Medicaid status.

refers to the pregnancies of women who indicated that they did not want to become pregnant at the time they conceived or at any time in the future. The fourth variable, which describes the pregnant woman rather than her pregnancy, refers to women who felt somewhat or very *unhappy* about being pregnant during the pregnancy,

*Mothers in racial or ethnic groups other than white or black comprised less than 1% of the total study population. Since the birth-weight distributions of minority women other than black were more similar to those of whites than those of blacks, we included all of the "other" women with the white respondents.

†For example, many national surveys, including the National Natality Survey, the National Maternal and Infant Health Survey, the Pregnancy Risk Assessment Monitoring System and the NSFG, define wantedness by asking women the following question: "Thinking back to when you became pregnant, did you want to become pregnant: 1) at an earlier time; 2) at that time; 3) did not want to become pregnant at that time but wanted a pregnancy some time in the future; or 4) did not want to become pregnant at that time or at any time in the future?" In this framework, unintended pregnancies include all pregnancies that were not planned at conception—that is, the pregnancies of women who responded "yes" to items 3 (mistimed pregnancies) and 4 (unwanted pregnancies).

Table 2. Percentage of women giving birth, by wantedness of pregnancy, according to race and Medicaid status

Wantedness	Total (N=2,828)	Race		Medicaid	
		Black	White	Yes	No
Unintended	57.9	73.9	48.5	71.6	47.0
Mistimed	42.3	47.5	39.3	50.7	35.8
Unwanted	15.6	26.4	9.3	21.0	11.3
Unhappy	15.5	27.7	8.3	21.3	10.9
Unsure	7.4	11.2	5.2	9.8	5.4
Composite denial	15.1	22.4	10.9	19.2	12.1

based on their Likert-type score.

The responses to the obstacles to prenatal care questions yielded the last two wantedness variables. The fifth variable describes women who felt *unsure* about whether they wanted to be pregnant. A sixth composite variable—*pregnancy denial*—was created by collapsing responses to three similar questions; it grouped together women who, when asked about having experienced difficulties in obtaining prenatal care, said that early in the pregnancy they had not wanted to think about being pregnant, had not wanted others to know about the pregnancy or had not known they were pregnant.

Since wide differences in birth-weight distributions between black and white infants have been well-documented,¹⁴ we controlled for race by matching very low birth weight cases with controls by race.

Statistical Analysis

For the bivariate analysis, we computed frequencies and crude odds ratios, along with their 95% confidence intervals. We used unconditional logistic regression analysis to determine the odds that a pregnancy would be unwanted if the baby was of low birth weight, versus the odds that the pregnancy would be unwanted if the baby was of normal weight, after adjusting for the effects of other factors associated with low birth weight. These risk factors included smoking during pregnancy, maternal age, race, education, health status, prepregnancy weight for height, parity, whether the respondent completed the in-hospital survey or the mailed questionnaire, and whether her infant died after the birth. We added the type of survey variable to the model because the women responding in the five hospitals were a more homogeneous group than those responding by mail, because the two different techniques yielded slightly different information and because controls were also chosen differently by mode of survey administration.

We added the infant death variable to all models (except the very low birth weight

vs. fetal death model) because such an event would likely play a part in the perception of happiness during pregnancy and pregnancy wantedness. The variable for type of survey (in-hospital interview or mailed questionnaire) was significant only in the very low birth weight vs. fetal

death model. We did not control for marital status because it was highly correlated with each of the pregnancy wantedness variables.

Results

Bivariate Analyses

Table 2 presents the proportions of women who described their pregnancy by the six variables of unwantedness, according to race and Medicaid status. The proportions of women who reported their pregnancy as unwanted, who were unhappy about it or who denied some aspect of it were quite similar (15.1–15.6%). Some 42% of the women classified their pregnancy as mistimed, and the largest proportion—58%—designated their pregnancy as unintended (which combines the mistimed and unwanted categories). Relatively few women (7%) reported that they were unsure about their pregnancy. Levels of unintended pregnancy were higher among black women and among Medicaid recipients (74% and 72%, respectively) than among white women and among those who were not receiving Medicaid (49% and 47%, respectively). Differentials by race and Medicaid status were also sizable for most of the remaining measures of unwantedness; only for the “mistimed” variable were the differences less extreme.

When the proportions of unwanted pregnancies among all women

and among subsets of women (by race and Medicaid status) are examined according to birth outcomes (see Table 3), we see that roughly similar proportions of low-birth-weight and normal-weight infants resulted from unintended pregnancies (58–59% and 62%, respectively). The proportion of pregnancies that were unwanted in each of the resulting birth-weight outcomes (excluding fetal death) is similar to the proportions for the unhappiness and denial variables. The proportion of women who were unsure about wanting to be pregnant is lower than the other wantedness variables for all birth-weight categories.

The distributions of birth-weight outcomes by maternal characteristics are described elsewhere.¹⁵ According to those data, women who delivered very low birth weight infants were more likely than women with normal-birth-weight babies to have had fewer years of schooling, to be unmarried, to have had five or more

Table 3. Percentage of births, by wantedness and maternal characteristics, according to birth outcome

Wantedness and characteristic	Outcome			
	Normal birth weight (N=800)	Moderately low birth weight (N=779)	Very low birth weight (N=799)	Fetal death (N=450)
UNINTENDED				
Total	61.9	59.3	57.9	50.2
Black	77.8	73.6	74.7	65.3
White	51.3	50.4	46.9	43.4
Medicaid	76.4	69.8	73.5	62.4
No Medicaid	49.2	48.7	46.8	42.6
MISTIMED				
Total	46.9	41.1	41.9	40.4
Black	53.1	45.0	46.4	48.9
White	42.7	38.6	38.9	36.6
Medicaid	56.6	46.5	52.4	47.1
No Medicaid	38.6	35.4	34.3	35.9
UNWANTED				
Total	15.0	18.3	16.1	9.8
Black	24.7	28.7	28.3	16.3
White	8.5	11.8	8.1	6.8
Medicaid	19.8	23.4	21.1	15.3
No Medicaid	10.6	13.3	12.5	6.8
UNHAPPY				
Total	13.3	17.3	18.6	10.7
Black	24.4	27.0	31.8	22.7
White	5.8	11.2	10.0	5.2
Medicaid	18.2	20.6	26.5	15.9
No Medicaid	8.9	14.1	12.7	6.8
UNSURE				
Total	6.7	7.7	9.4	5.6
Black	10.1	9.2	16.2	7.8
White	4.4	6.8	4.9	4.6
Medicaid	9.4	8.5	14.7	6.5
No Medicaid	4.4	6.9	5.4	4.6
COMPOSITE DENIAL				
Total	12.5	15.6	19.1	14.0
Black	20.3	19.2	28.9	21.3
White	7.3	13.4	12.7	10.7
Medicaid	16.0	17.8	27.4	16.5
No Medicaid	9.4	13.9	13.4	12.5

Note: In this and subsequent tables, very low birth weight is defined as <1,500 g at birth; moderately low birth weight is defined as 1,500–2,499 g; and normal birth weight is defined as ≥2,500 g.

prior pregnancies and to have been in poor health during the pregnancy. Moreover, women who delivered a moderately low birth weight infant were more likely than mothers of normal-birth-weight infants to have had fewer years of schooling, to be unmarried, to have smoked during pregnancy and to have experienced poor health during pregnancy.

The birth-weight outcome groups did not differ significantly by age or race, an expected finding because these variables were used in the initial matching of controls. Furthermore, compared with women delivering normal-birth-weight infants, those who delivered very low birth weight infants were less likely to have received assistance from the Special Supplemental Food Program for Women, Infants and Children and were more than three times as likely to have lacked prenatal care. Women who delivered a moderately low birth weight infant were more likely than those delivering normal-birth-weight babies to have been enrolled in Medicaid and to have gone without prenatal care.

Multivariate Analyses

Table 4 presents the adjusted odds ratios (and 95% confidence intervals) predicting each of the six pregnancy wantedness variables for four birth-weight and outcome comparisons. In the total study population, none of the birth-weight and birth-outcome comparisons significantly affected the odds that a woman would designate her pregnancy as unintended or mistimed or that she would be unsure about wanting the pregnancy. For the outcome of unwanted pregnancy, however, odds ratios were statistically significant for mothers of very low birth weight infants compared with women whose pregnancy ended with a fetal death; the mothers of these live-born infants were 70% more likely to report that the pregnancy was unwanted than were mothers who experienced a fetal death (odds ratio of 1.70).

Women with very low birth weight infants were significantly more likely to report that they were somewhat or very unhappy about their pregnancies than were normal-weight controls (odds ratio of 1.53) and than were women whose pregnancy ended in a fetal death (odds ratio of 1.88). Finally, in the model predicting the composite pregnancy denial variable, mothers of very low birth weight infants were 54% more likely than controls to say that they did not want others to know about the pregnancy, did not want to think about it or did not know about it (odds ratio of 1.54).

Table 5 (page 80) presents the adjusted

Table 4. Adjusted odds ratios (and 95% confidence intervals) predicting wantedness among four birth-weight and birth-outcome comparisons

Wantedness	Very low vs. normal	Moderately low vs. normal	Very low vs. moderately low	Very low vs. fetal death
Unintended	0.79 (0.61–1.02)	0.82 (0.66–1.02)	0.98 (0.76–1.25)	1.21 (0.92–1.58)
Mistimed	0.75 (0.48–1.02)	0.77 (0.53–1.01)	0.99 (0.72–1.26)	1.15 (0.86–1.44)
Unwanted	1.18 (0.86–1.64)	1.19 (0.90–1.59)	0.96 (0.71–1.32)	1.70* (1.11–2.60)
Unhappy	1.53* (1.10–2.12)	1.26 (0.94–1.70)	1.24 (0.91–1.68)	1.88* (1.25–2.83)
Unsure	1.19 (0.76–1.85)	1.13 (0.75–1.70)	1.16 (0.77–1.76)	1.46 (0.86–2.47)
Composite denial	1.54* (1.11–2.14)	1.33 (0.98–1.79)	1.29 (0.96–1.75)	1.37 (0.95–1.97)

*Here and in Table 5, difference from comparison group is statistically significant at $p \leq .05$ level. Note: Here and in Table 5, data were adjusted for smoking, age, education, health during pregnancy, maternal weight, gravidity, type of survey (in-hospital or mailed), and for the first three comparisons, whether the baby had died.

odds ratios and 95% confidence intervals predicting the pregnancy wantedness variables for the four birth-outcome comparisons, stratified by race and Medicaid status. Unintended pregnancies were 31% less likely among women not receiving Medicaid who had a very low birth weight infant as among their counterparts with infants of normal weight (odds ratio of 0.69). Further, unintended pregnancies were 53% more common among black mothers of very low birth weight infants than among those whose pregnancies ended in a fetal death (odds ratio of 1.53), and the odds ratio was also significant among Medicaid recipients for the same comparison (1.61).

Odds ratios for mistimed pregnancies (not wanted at that time, but wanted some time in the future) were statistically significant in only one group of women in one comparison—Medicaid recipients in the very low birth weight vs. fetal death category. Among Medicaid recipients, those delivering a very low birth weight baby were more likely to report a mistimed pregnancy than those who had experienced a fetal death (odds ratio of 1.55).

Odds ratios for unwanted pregnancies were also significant only in the comparison of very low birth weight infants vs. fetal deaths. Pregnancies resulting in very low birth weight infants were more likely than those ending in death to be unwanted among blacks (odds ratio of 2.71) and among Medicaid recipients (odds ratio of 2.13).

Women whose babies were very low birth weight were significantly more likely than normal controls to have reported being unhappy about the pregnancy (odds ratio of 1.45) if they were receiving Medicaid. In the same model for unhappiness about the pregnancy, odds ratios comparing moderately low birth weight to normal-weight infants were significant among white women (odds ratio of 1.61) and among those not receiving Medicaid (odds ratio of 1.59). And all mothers of

very low birth weight infants, regardless of race or Medicaid status, were significantly more likely than their counterparts whose pregnancy ended in a fetal death to report having felt somewhat or very unhappy about being pregnant.

Uncertainty about wanting the pregnancy was significant when very low birth weight infants were compared with those who were of normal weight among Medicaid recipients (odds ratio of 1.53). Moreover, odds ratios for this uncertainty variable were statistically significant when very low birth weight infants were compared with those of moderately low birth weight among black respondents (odds ratio of 1.66) and among women qualifying for Medicaid (odds ratio of 1.68). Uncertainty about the pregnancy was 2.3 times more likely among black women who delivered a very low birth weight infant than among those whose pregnancy ended in a fetal death (odds ratio of 2.34); odds ratios in the same comparison were similarly elevated among women receiving Medicaid (odds ratio of 1.93).

Denial of some aspect of the pregnancy was more common among white mothers of very low birth weight infants than among normal-birth-weight controls (odds ratio of 1.79); the same was true among Medicaid recipients (odds ratio of 1.88). Moreover, among whites and among women not receiving Medicaid, mothers of a moderately low birth weight infant were significantly more likely than normal-birth-weight controls to have given an indication of denial (odds ratios of 1.81 and 1.59, respectively). However, denying some aspect of the pregnancy was significantly more likely among mothers of a very low birth weight infant than among those having a moderately low birth weight baby only among blacks (odds ratio of 1.48) and Medicaid recipients (odds ratio of 1.70). Finally, Medicaid recipients who had a very low birth weight infant were significantly more likely than those whose pregnancy ended in

Table 5. Adjusted odds ratios (and 95% confidence intervals) predicting pregnancy wantedness among four birth-weight and birth-outcome comparisons, by race and Medicaid status

Wantedness and characteristic	Very low vs. normal	Moderately low vs. normal	Very low vs. moderately low	Very low vs. fetal death
Unintended				
Black	0.72 (0.32–1.12)	0.80 (0.42–1.18)	0.99 (0.61–1.37)	1.53* (1.04–2.02)
White	0.74 (0.46–1.02)	0.83 (0.55–1.10)	0.89 (0.61–1.17)	1.11 (0.78–1.44)
Medicaid	0.90 (0.52–1.28)	0.73 (0.39–1.07)	1.17 (0.82–1.52)	1.61* (1.81–2.04)
No Medicaid	0.69* (0.39–0.99)	0.90 (0.60–1.20)	0.80 (0.49–1.10)	1.01 (0.65–1.37)
Mistimed				
Black	0.78 (0.30–1.26)	0.80 (0.38–1.22)	1.06 (0.57–1.55)	1.33 (0.79–1.88)
White	0.72 (0.39–1.05)	0.75 (0.46–1.04)	0.96 (0.64–1.28)	1.10 (0.75–1.45)
Medicaid	0.94 (0.49–1.39)	0.75 (0.34–1.06)	1.36 (0.94–1.78)	1.55* (1.09–2.02)
No Medicaid	0.69 (0.33–1.05)	0.83 (0.51–1.15)	0.86 (0.50–1.22)	0.94 (0.56–1.32)
Unwanted				
Black	0.84 (0.34–1.34)	1.03 (0.55–1.51)	0.93 (0.45–1.41)	2.71* (1.97–3.45)
White	0.75 (0.22–1.28)	1.06 (0.59–1.53)	0.65 (0.16–1.14)	1.26 (0.61–1.91)
Medicaid	0.94 (0.42–1.46)	0.90 (0.43–1.37)	0.88 (0.40–1.36)	2.13* (1.45–2.81)
No Medicaid	0.80 (0.28–1.32)	1.25 (0.75–1.75)	0.73 (0.22–1.24)	1.71 (0.99–2.43)
Unhappy				
Black	1.18 (0.80–1.57)	1.09 (0.71–1.47)	1.13 (0.75–1.51)	1.58* (1.04–2.12)
White	1.46 (0.93–1.99)	1.61* (1.11–2.11)	0.93 (0.49–1.37)	2.20* (1.55–2.85)
Medicaid	1.45* (1.04–1.86)	1.08 (0.69–1.47)	1.28 (0.89–1.67)	1.77* (1.22–2.32)
No Medicaid	1.12 (0.63–1.61)	1.59* (1.11–2.07)	0.80 (0.36–1.24)	2.20* (1.56–2.85)
Unsure				
Black	1.41 (0.73–2.09)	0.93 (0.38–1.48)	1.66* (1.13–2.19)	2.34* (1.53–3.15)
White	0.95 (0.30–1.61)	1.37 (0.78–1.96)	0.73 (0.15–1.32)	0.97 (0.22–1.72)
Medicaid	1.53* (1.02–2.04)	0.94 (0.42–1.46)	1.68* (1.17–2.19)	1.93* (1.19–2.67)
No Medicaid	0.95 (0.28–1.62)	1.46 (0.83–2.09)	0.72 (0.11–1.33)	1.14 (0.34–1.94)
Composite denial				
Black	1.23 (0.83–1.63)	0.99 (0.58–1.40)	1.48* (1.08–1.88)	1.50 (0.95–2.05)
White	1.79* (1.32–2.25)	1.81* (1.36–2.26)	0.99 (0.59–1.39)	1.30 (0.79–1.81)
Medicaid	1.88* (1.48–2.28)	1.16 (0.77–1.56)	1.70* (1.32–2.08)	1.69* (1.18–2.20)
No Medicaid	1.10 (0.63–1.57)	1.59* (1.13–2.05)	0.79 (0.36–1.22)	1.15 (0.60–1.70)

*Difference from comparison group is statistically significant at p<.05.

a death to have denied some aspect of their pregnancy (odds ratio of 1.69).

No clear pattern emerged that differentiated the results by race. For example, in the comparisons of mothers of very low or moderately low birth weight babies to normal controls, the odds ratios for the composite denial variables were uniformly higher among whites than among blacks (significant odds ratios of 1.79–1.81 and nonsignificant odds ratios of 0.99–1.23, respectively). However, the odds of giving comments included in the composite denial variable were higher among black women than among whites when mothers of very low birth weight infants were compared with mothers of moderately low birth weight infants. The odds of being unhappy about the pregnancy were also significantly elevated for mothers of moderately low birth weight infants compared with normal-weight controls among whites but not blacks.

The results were also not uniform by Medicaid status. For example, odds ratios for the unhappiness variable were elevated and statistically significant among the women receiving Medicaid for the very low birth weight vs. normal-birth-weight comparison, but the situation was

reversed when mothers of moderately low birth weight infants were compared with normal-weight controls: Odds were elevated and significant among women not receiving Medicaid.

The same split result emerged for the model predicting the composite pregnancy denial variable: Odds ratios were significant and elevated among women receiving Medicaid for the comparison of the very low birth weight infants to normal-birth-weight infants, while odds were elevated and significant among women not receiving Medicaid in the comparison of moderately low birth weight to normal weight. Furthermore, for women receiving Medicaid (but not for those not qualifying for public medical assistance), the odds of being unsure about the pregnancy were significantly higher among mothers of low birth weight infants than among women who had a normal-birth-weight infant.

Discussion

While our findings do not offer overwhelming evidence of a relationship between pregnancy outcome and pregnancy wantedness, the measures of wantedness developed specifically for this study appear to yield more of an association than do the

traditional measures (mistimed and unwanted pregnancies). Differences by race were not remarkable, but Medicaid mothers were very likely to have reported a relationship between adverse outcomes and the new measures of unwantedness (unhappy, unsure and the composite variable).

Few studies have examined the relationship between pregnancy wantedness and pregnancy outcome;¹⁶ indeed, defining unwanted pregnancy has been problematic for researchers. Most definitions of wantedness and intendedness are related to timing of the pregnancy. This categorization may be problematic, because a woman who may not have wanted to become pregnant “now or at any time in the future” might nonetheless become reconciled to and happy about her pregnancy. How a woman feels about becoming pregnant at conception (timing and intendedness) may be very different from how she feels about being pregnant *during* the pregnancy.

Our study used measures designed to gauge these feelings during the pregnancy. The retrospective reports of the women using both sets of measures revealed that pregnancies resulting in fetal deaths were more wanted than those resulting in infants with very low birth weight. Possible explanations for this finding may be that such deaths are more common among women with infertility problems who want children badly, or that a fetal death leads to a biased retrospective recall of feelings.

After all other variables were controlled for, low birth weight did not differentiate the wantedness of the pregnancies (i.e., whether they were mistimed or unwanted) using the timing-wantedness scale. Birth outcome, on the other hand, did reveal some differences in the pregnancy-happiness scale and the composite denial variable: Overall, mothers of very low birth weight infants were significantly more likely than those of normal-birth-weight infants to have felt “somewhat or very unhappy” about being pregnant during the pregnancy.

When analyzed by race and Medicaid status, white women and Medicaid recipients who were mothers of very low birth weight infants were more likely than mothers of normal-weight controls to have, early in their pregnancy, not wanted others to know about it or not known they were pregnant. Further, among whites (and among women not qualifying for Medicaid), mothers of moderately low birth weight infants were also more likely than control mothers of normal-

weight infants to have reported one of the three elements in this composite pregnancy-denial variable.

The results of our study suggest that asking a woman when or if she wanted to become pregnant is not as sensitive an indicator as asking how she felt about being pregnant. Certainly, women who wanted to conceive "sooner" or "at that time" can safely be described as wanting to be pregnant, but does pregnancy timing really mean the same thing as wantedness? Many women have a mistimed pregnancy, but those who choose to carry it to term may not only have resigned themselves to the pregnancy but may have come to view it positively.

One major limitation of our study was the retrospective nature of the questionnaire. Women's feelings about the wantedness of the pregnancy may have changed once the baby was born, and responses to questions about the pregnancy asked postpartum may not adequately reflect the woman's feelings during the pregnancy. A more accurate point at which to assess pregnancy wantedness might be the time of the pregnancy test or the first prenatal visit, which would require a prospective study design.

Additional bias may have been introduced into the study through the two modes of survey administration—the in-hospital postpartum interviews or the questionnaires mailed three months postpartum. Although we attempted to reduce this bias by controlling for the type of survey, the mothers' recollection about pregnancy wantedness might have differed at these two points in time. Nevertheless, we believe that having an in-hospital interview survey in addition to a traditional mailed survey was justified to achieve a higher response rate, particularly among low-income women. Another limitation of the case-control study design was that basing the choice of controls on race prevented us from looking at race except as an effect modifier.

Although there was no statistically significant relationship between very low birth weight and the probability that the pregnancy was unwanted as measured by pregnancy timing, there was a statistically significant association between both very low and moderately low birth weight and unwanted pregnancy as measured by unhappiness about the pregnancy and by denial. This association was particularly strong among Medicaid recipients; such women giving birth to very low birth weight infants were more likely than those delivering normal-weight babies to have

reported feeling unhappy about the pregnancy, to have said they were unsure about wanting to be pregnant or to have reported any of the pregnancy-denial composite variables. Given the high proportion of Medicaid-funded births, reducing unwanted pregnancy in this population would contribute to a reduction in the cost of care regardless of birth weight, and particularly for very low birth weight infants.

What can we conclude from the finding that rates of unintended pregnancy were not significantly higher among women who delivered low and moderately low birth weight infants compared with controls? Unintended pregnancies appear to be common across the spectrum of birth weight. Our data do not support the idea that unintended pregnancy is an independent factor in infant morbidity, as defined by low birth weight. Unintended pregnancy may contribute to low birth weight through other behaviors—for example, through smoking or alcohol and drug use—and may be a factor in child abuse and neglect, although this is difficult to measure. Further research on the impact of unwanted childbearing on child abuse and neglect is warranted.

Low birth weight is associated with financial, social and health consequences for the infant and the family. Some 58% of the very low birth weight births and 59% of the moderately low birth weight births in this study resulted from unintended pregnancies. Reducing the number of unintended pregnancies would likely reduce the overall number (though not the rate) of low-birth-weight infants. If the United States is to make continued progress toward improving the health of women and their infants, efforts must be made to help ensure that women desire and plan for each pregnancy.

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