

Pregnancy Intention and Preterm Birth: Differential Associations Among a Diverse Population of Women

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CONTEXT: Studies published to date provide mixed evidence on the relationship between unintended pregnancy and preterm birth, and none take into consideration that the meaning of unintended pregnancy may vary across racial and ethnic groups.

METHODS: Data from the 1999–2003 rounds of the Maternal and Infant Health Assessment, a population-based, representative survey of postpartum women in California, were used to assess the relationship between pregnancy intention and preterm birth. For racial and ethnic groups in which an association was found, sequential logistic regression was conducted to further examine the relationship while controlling for socioeconomic characteristics.

RESULTS: In unadjusted results, pregnancy intention was associated with preterm birth among both whites and immigrant Latinas, but not among blacks or U.S.-born Latinas. Among whites, compared with women who reported that their pregnancy was intended, those who were unsure about their pregnancy had elevated odds of preterm birth (odds ratio, 1.4), as did those who reported their pregnancy was unwanted (1.7) or mistimed (1.4). Among immigrant Latinas, those who reported being unsure about their pregnancy were at higher risk of preterm birth than were those who reported an intended pregnancy (1.6). After adjustment for socioeconomic factors, the association remained significant for immigrant Latinas who were unsure about their pregnancy (1.5), but none of the associations remained significant for whites.

CONCLUSIONS: Women's interpretations of questions about pregnancy intention and their social experiences regarding pregnancy intention may vary by race or ethnicity. Studies on the association between pregnancy intention and preterm birth may need to be group-specific.

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Almost half (49%) of pregnancies in the United States are unintended, and almost half of unintended pregnancies end in abortion.¹ The demographic groups with the highest rates of unintended birth generally are the poor, those without a college education, those who are unmarried, those aged 20–24 years and minorities.¹ For example, unintended births occur at a rate of 58 births per 1,000 women among those with a family income below the federal poverty level; this rate is 35 and 40 per 1,000 among black and Latina women, respectively, in comparison with 22 per 1,000 among all women in the United States.¹

Unintended pregnancy has repeatedly been shown to be associated with a range of poor maternal and infant health indicators, including preterm birth, low birth weight and inadequate well-baby care, and with poor social outcomes.^{2–12} Preterm birth has extremely serious adverse consequences for infant mortality and both short- and long-term morbidity and development.^{13–15} Unintended pregnancy might influence the risk of preterm birth by modifying a woman's psychological state—for example, by contributing to depression or psychological stress.^{12,16–22} In addition, a woman who did not plan a pregnancy might not be aware of one early on, and thus

might not engage in health-promoting maternal behaviors, such as cessation of smoking or harmful drug use, in a timely manner.^{2,3} However, studies published to date provide mixed evidence on the relationship between unintended pregnancy and preterm birth, and none take into consideration that the meaning of unintended pregnancy may vary across racial and ethnic groups.^{23–25}

According to conventional classifications,^{1,2} unintended pregnancies are ones that are mistimed (occur earlier than wanted) or unwanted (not wanted at any time). Estimates of unintended pregnancy rates are usually based on retrospective reports, collected in surveys some time after a birth or a pregnancy termination. However, a retrospective approach has inherent limitations. Some research suggests that reported intentions become more positive with time after the child is born,^{26,27} while other research suggests that reports may become more negative with time, reflecting a partner's and family's reactions to the unexpected pregnancy.²⁸ Furthermore, because unintended pregnancy rates differ markedly by race and ethnicity, researchers have begun to question the meaning of unintended pregnancy and, consequently, its measurement across social groups of women.^{23–25,29–36}

Qualitative studies suggest that the idea of planning a pregnancy may have limited relevance for some groups of women. A study that was based on in-depth interviews with low-income black adolescent women in New Orleans found an inconsistency between their expressed desire to postpone pregnancy and their observed behavior, manifested in unintended childbearing. The researchers suggest that the interplay between community acceptance of teenage pregnancy, limited socioeconomic opportunities, and imperfect knowledge of and access to reproductive health care may make it difficult for young black women to realize their intentions.^{24,25} Barrett and Wellings, who conducted in-depth interviews with a diverse group of women in London, suggest that a planned pregnancy is a somewhat idealized goal, regardless of women's socioeconomic status. According to those interviewed, achieving a planned pregnancy requires that women deliberately decide to become pregnant, temporarily discontinue any contraceptive use, be in agreement with their partner and reach the right time in terms of lifestyle or life stage.³⁰ Indeed, even for women who believe they have control over any one of these factors, having control over all of them simultaneously presents an even greater challenge.

PREGNANCY INTENTION AND PRETERM BIRTH

It is important to consider the findings of studies on the associations between pregnancy intention and preterm birth in light of the potentially varied meaning of pregnancy intention across social groups of women. A prospective study of 434 women receiving prenatal care in Belgium found a positive association between unintended pregnancy and preterm birth after adjustment for women's medical risk status and socioeconomic status, although this study did not use the conventional intendedness classifications.⁷ A prospective study of 922 low-income black women recruited at prenatal clinics in Baltimore found a positive association between unintended pregnancy, using the conventional classification, and preterm birth after other medical risk factors were adjusted for.⁸ Another study, using 1995 National Survey of Family Growth (NSFG) data, found a higher risk of preterm birth among women whose pregnancies were mistimed by two years or more than among those who had intended pregnancies.⁹

On the other hand, three clinic-based studies found no evidence of an association between preterm birth and unintended pregnancy. One included 1,908 women (the majority of whom were white) in North Carolina,¹² one was conducted among 416 low-income black women in Harlem¹⁰ and one involved 1,404 women recruited from a prenatal clinic in northwestern Russia.¹¹

Furthermore, other studies have shown that the association between unintended pregnancy and other maternal, infant and child health outcomes diminishes and sometimes disappears after adjustment for maternal socioeconomic variables.^{3,4,6} All of these studies were

based on data sets with relatively extensive socioeconomic information (e.g., the National Longitudinal Survey of Youth), and used multiple socioeconomic variables, including mother's family structure at age 14, receipt of public assistance, mother's education, mother's labor force status and family income. The studies discussed above, however, had little information on socioeconomic status, and all but one relied on data from prenatal clinics; these facts limit the ability to assess potential confounding and generalizability.

The current study was conducted to examine the relationship between unintended pregnancy and preterm birth in a large, population-based sample of racially and ethnically diverse postpartum women with more extensive socioeconomic information than has been available in prior studies. Specifically, the analysis investigates the following research questions: Is unintended pregnancy associated with preterm birth among the general population of childbearing women and among childbearing women of different racial and ethnic groups in California? If so, do socioeconomic factors confound the relationship?

METHODS

Study Design

We used five years (1999–2003) of data from the California Maternal and Infant Health Assessment (MIHA). MIHA, a collaborative project of the state health department's Maternal and Child Health/Office of Family Planning Branch and the University of California, San Francisco, is an annual survey of women having live births in California from February through May; its data are linked with birth certificate data, which provide the sampling frame. Women are eligible to participate in MIHA if they are English- or Spanish-speaking state residents; are 15 or older; had singleton, twin or triplet births; and had addresses recorded on birth certificates. The sample is stratified according to region in California and woman's education and race or ethnicity, and selected randomly from within those strata; blacks are oversampled. Approximately 3,500 women are interviewed each year, and the sample is representative of the more than 150,000 women who give birth in California during the four-month assessment period.

MIHA includes a range of questions on maternal and infant health and maternal socioeconomic and demographic characteristics. Surveys in English and Spanish are mailed to women 10–14 weeks after they have given birth; two weeks after the initial mailing, reminder postcards are sent to nonrespondents, and three weeks after the reminders, a second mailing of questionnaires is sent. Telephone contact is attempted with nonrespondents and those whose surveys are returned because of incorrect addresses. In 1999–2003, surveys were completed 2–7 months after the surveys were mailed. Questionnaires were completed by mail for about 75% of respondents

and by telephone for about 25%; 75% of the surveys were completed in English, and 25% in Spanish.

In 1999–2003, a total of 17,725 women completed the MIHA survey. The response rate was 72% overall, but was somewhat lower (63–68%) among subgroups who traditionally are less likely than average to participate in mail or telephone surveys (those with less than a high school education, black women and Latina women born outside the United States). However, the maternal characteristics of the sample are similar to those of all eligible women who gave birth statewide (information available upon request).

A survey question combining race and ethnicity was used in conjunction with birth certificate information on birthplace to create seven mutually exclusive racial and ethnic group categories: black, U.S.-born Asian, immi-

grant Asian, U.S.-born Latina, immigrant Latina, Native American and white. There were too few immigrant blacks or immigrant whites to examine separately. U.S.-born Asians and Native Americans were excluded from selected analyses because sample sizes were small; immigrant Asians were excluded because the sample likely was not representative, as the survey was not translated into any Asian languages. White women made up the largest proportion of the sample, followed by immigrant Latinas, U.S.-born Latinas and blacks. The analysis was limited to women reporting singleton births, as women with multiple births have a different risk profile for preterm birth.^{37,38} The final sample size for the primary analyses was 15,331; women who did not report race or ethnicity and those who were Asian or Native American were excluded.

TABLE 1. Percentage distribution of postpartum women, by selected characteristics, according to racial or ethnic group, California Maternal and Infant Health Assessment, 1999–2003

Characteristic	All† (N=17,017)	Black (N=2,377)	U.S.-born Latina (N=2,485)	Immigrant Latina (N=4,706)	White (N=5,763)	Native American (N=109)	U.S.-born Asian (N=318)	Immigrant Asian (N=1,259)
Preterm birth								
Yes	9.0	13.9	9.5	8.7	8.3	14.8	8.3	9.0
No	91.0	86.1	90.5	91.3	91.7	85.2	91.7	91.0
Pregnancy intendedness								
Unsure	12.7	21.2	16.6	10.4	11.6	23.2	11.1	12.3
Unwanted	8.8	14.7	11.1	10.1	6.1	13.1	5.0	7.6
Mistimed	24.5	30.3	31.2	25.6	20.4	27.7	28.6	20.8
Intended	54.0	33.7	41.2	54.0	62.0	36.1	55.3	59.3
Family income (as % of federal poverty level)								
0–100	32.5	44.7	39.0	52.8	15.0	39.4	21.4	17.0
101–200	20.2	21.7	24.5	24.8	15.5	24.2	14.3	16.3
201–300	9.6	9.6	10.5	4.3	12.9	19.8	7.7	12.2
301–400	6.9	5.5	6.7	1.9	10.6	4.4	8.7	9.8
≥401	21.3	10.2	9.6	2.4	39.2	8.8	38.5	37.8
Unknown	9.5	8.3	9.7	13.8	6.8	3.5	9.3	7.0
Education								
<high school	22.5	18.1	27.8	44.2	7.2	25.2	9.5	7.5
High school/GED	25.3	29.0	30.2	35.6	17.3	21.3	18.2	13.7
Some college	28.3	39.1	33.5	14.8	35.2	44.5	30.3	27.1
≥college	23.9	13.8	8.5	5.4	40.4	9.1	42.0	51.7
Education of the baby's father								
<high school	24.1	8.3	24.9	55.6	5.5	14.8	10.2	5.2
High school/GED	27.9	41.7	40.4	23.5	26.2	37.6	21.8	17.9
Some college	16.4	19.7	15.7	7.5	22.6	22.5	17.2	20.2
≥college	23.5	13.5	8.5	4.7	39.7	12.6	41.6	52.8
Unknown	8.1	16.8	10.5	8.7	6.0	12.5	9.2	3.9
Age								
15–19	10.4	16.5	22.5	10.0	5.9	13.1	15.8	2.1
20–24	23.2	27.4	34.6	26.3	17.8	34.9	20.4	10.8
25–34	50.2	42.9	36.2	50.6	54.5	41.1	45.6	63.5
≥35	16.2	13.2	6.7	13.1	21.8	10.9	18.1	23.6
Parity								
1	39.9	38.3	42.0	31.0	43.9	37.1	52.1	48.3
2–4	55.8	53.7	53.6	62.4	53.6	54.7	47.7	49.6
≥5	4.3	8.0	4.4	6.6	2.5	8.2	0.3	2.1
Marital status								
Unmarried	34.6	65.1	51.4	40.6	22.1	56.1	31.9	12.7
Married	65.5	34.9	48.6	59.5	77.9	43.9	68.1	87.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

†Excludes women who did not report race or ethnicity. Notes: Percentages may not total 100.0 because of rounding. Percentages incorporate population-based sampling weights.

Study Variables

From birth certificate data on gestational age, we identified women who had a preterm birth, defined as a birth at less than 37 weeks of gestation. We used several measures to reflect socioeconomic status: educational attainment of the woman and of her baby's father, and family income (as a percentage of the federal poverty level, which was estimated using published guidelines from the U.S. Census Bureau for the relevant year³⁹). Because both young age at first birth and single parenthood have repeatedly been associated with socioeconomic disadvantage,² we also included the relevant demographic variables: maternal age, parity and marital status.

The main independent variable is pregnancy intention, defined with four categories—intended, mistimed, unwanted and unsure. Because mistimed and unwanted pregnancies might be qualitatively distinct and might have differential impacts on pregnancy outcomes,^{2,9,33} intention status was analyzed as a four-category variable (intended vs. mistimed vs. unwanted vs. unsure), as opposed to a dichotomous variable (unintended vs. intended).⁹ The following MIHA question (modeled on Pregnancy Risk Assessment Monitoring System and NSFG questions) was used to construct the pregnancy intention measure: “Thinking back to just before you got pregnant, how did you feel about getting pregnant?” Response choices are “I wanted to get pregnant then” (indicating that the pregnancy was intended), “I wanted to get pregnant later” (it was mistimed), “I didn’t want to get pregnant then or in the future” (it was unwanted) and “I wasn’t sure what I wanted.” Consistent with other research utilizing MIHA data, women who reported that their pregnancy was mistimed or unwanted or that they were unsure about their pregnancy were classified as having an unintended pregnancy;⁴⁰ our definition is modeled after the conventional definition but also includes “unsure” responses.

Analytic Approach

MIHA data were statistically weighted so that results can be generalized to the statewide population of eligible women with live births in the years 1999–2003. We used SAS⁴¹ to describe sample characteristics and SUDAAN⁴² to construct logistic regression models. Unadjusted odds ratios examining predictors of preterm birth (with 95% confidence intervals) were calculated first among all women and then within each racial and ethnic group. Racial and ethnic groups in which preterm birth was associated with unintended pregnancy were further analyzed through sequential multiple regression. Each model in these analyses added one of the following variables to the unadjusted model: family income, respondent's education, paternal education, age, parity and marital status. We examined changes in odds ratios and 95% confidence intervals and log-likelihood ratio tests for each model to assess how the addition of each variable affected the associations and to assess the practical

significance of the contribution of each variable to each successive model. We also constructed a full model that adjusted for all socioeconomic factors related to preterm birth. (Models in which there were no significant associations are not shown.)

RESULTS

Sample Characteristics

Overall, 9% of women in this sample had a preterm birth; the proportion ranged from 8% among white and U.S.-born Asian women to 14–15% among blacks and Native Americans (Table 1). Thirteen percent of the women reported being unsure about pregnancy intention, 9% reported that their pregnancies were unwanted and 25% reported that their pregnancies were mistimed. In total, 46% of these pregnancies were unintended. The proportion of women reporting unintended pregnancy ranged from 38% among white women to 59–66% among U.S.-born Latinas, Native Americans and black women.

The proportion of women who were college graduates ranged from 5% among immigrant Latinas to 52% among immigrant Asians. Among U.S. born-Latinas, 23% of births were among women aged 15–19; 2% of births among immigrant Asians were to women in this age-group. Finally, the proportion of women reporting being unmarried ranged from 13% among immigrant Asians to 65% among blacks.

TABLE 2. Unadjusted odds ratios (and 95% confidence intervals) from logistic regression analyses assessing the relationship between preterm birth and pregnancy intention, by race or ethnicity

Characteristic	Odds ratio
All women	
Unsure	1.39 (1.18–1.62)
Unwanted	1.39 (1.15–1.67)
Mistimed	1.20 (1.05–1.37)
Intended (ref)	1.00
Black	
Unsure	1.04 (0.74–1.46)
Unwanted	1.07 (0.72–1.57)
Mistimed	0.87 (0.63–1.20)
Intended (ref)	1.00
U.S.-born Latina	
Unsure	1.15 (0.77–1.79)
Unwanted	0.95 (0.59–1.53)
Mistimed	1.21 (0.89–1.66)
Intended (ref)	1.00
Immigrant Latina	
Unsure	1.63 (1.19–2.23)
Unwanted	1.39 (0.99–1.93)
Mistimed	1.05 (0.82–1.36)
Intended (ref)	1.00
White	
Unsure	1.44 (1.08–1.92)
Unwanted	1.71 (1.20–2.45)
Mistimed	1.35 (1.07–1.71)
Intended (ref)	1.00

Notes: ref=reference group. The analyses accounted for population weights. Odds ratios for Native Americans, U.S.-born Asians and immigrant Asians are excluded because of sample limitations; however, none were significant.

TABLE 3. Odds ratios (and 95% confidence intervals) from logistic regression analyses assessing the relationship between preterm birth and pregnancy intention among white women

Characteristic	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6†
Pregnancy intendedness						
Unsure	1.44 (1.08–1.92)	1.20 (0.90–1.60)	1.30 (0.98–1.75)	1.28 (0.96–1.71)	1.22 (0.91–1.63)	1.11 (0.82–1.49)
Unwanted	1.71 (1.20–2.45)	1.38 (0.95–2.00)	1.53 (1.06–2.21)	1.48 (1.03–2.14)	1.45 (1.00–2.09)	1.31 (0.89–1.91)
Mistimed	1.35 (1.07–1.71)	1.11 (0.87–1.43)	1.23 (0.97–1.57)	1.21 (0.95–1.54)	1.14 (0.89–1.47)	1.08 (0.83–1.41)
Intended (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Family income (as % of federal poverty level)						
0–100	na	1.93 (1.46–2.56)	na	na	na	1.69 (1.16–2.46)
101–200	na	1.46 (1.10–1.94)	na	na	na	1.28 (0.92–1.78)
201–300	na	1.22 (0.89–1.66)	na	na	na	1.12 (0.81–1.55)
301–400	na	1.02 (0.71–1.45)	na	na	na	0.97 (0.67–1.39)
≥401 (ref)	na	1.00	na	na	na	1.00
Unknown	na	0.86 (0.55–1.33)	na	na	na	0.81 (0.51–1.26)
Education						
<high school	na	na	1.65 (1.16–2.34)	na	na	1.24 (0.79–1.94)
High school/GED	na	na	1.40 (1.05–1.86)	na	na	1.15 (0.82–1.63)
Some college	na	na	1.45 (1.15–1.82)	na	na	1.23 (0.95–1.59)
≥college (ref)	na	na	1.00	na	na	1.00
Education of the baby's father						
<high school	na	na	na	1.33 (0.86–2.07)	na	0.94 (0.57–1.55)
High school/GED	na	na	na	1.43 (1.11–1.83)	na	1.13 (0.84–1.52)
Some college	na	na	na	1.52 (1.18–1.96)	na	1.32 (1.00–1.73)
≥college (ref)	na	na	na	1.00	na	1.00
Unknown	na	na	na	2.02 (1.40–2.93)	na	1.33 (0.87–2.04)
Marital status						
Unmarried	na	na	na	na	1.58 (1.26–1.99)	1.27 (0.96–1.68)
Married (ref)	na	na	na	na	1.00	1.00
–2 log likelihood‡ (difference in df)	3,256.95	26.72***(5)	22.46***(3)	18.8***(4)	26.97***(1)	65.6***(18)

***p<.001. †Model includes age and parity; results for these characteristics are not shown because they did not affect the association between preterm birth and pregnancy intention. ‡For model 1, the test compared the full model with the intercept-only model; the remaining models are compared with model 1. Notes: ref=reference group. na=not applicable. The analyses accounted for population weights.

Odds of Preterm Birth by Racial or Ethnic Group

Women who did not intend their pregnancy had an elevated likelihood of preterm birth (Table 2, page 69). Compared with those whose pregnancy was intended, women who were unsure about their pregnancy were at higher risk of preterm birth (odds ratio, 1.4), as were those reporting their pregnancy as unwanted (1.4) or mistimed (1.2). The risk of preterm birth was associated with unintendedness among white women (unsure, 1.4; unwanted, 1.7; and mistimed, 1.4) and among immigrant Latinas (unsure, 1.6), but not among black or U.S.-born Latina women. Thus, multivariate analyses are presented only for whites and immigrant Latinas.

Among white women, adjustment for income alone had the greatest effect on the likelihood of preterm birth, resulting in nonsignificant odds ratios for all categories of pregnancy intention (Table 3). With the addition of maternal education, paternal education or marital status, the relationship between unintended pregnancy and preterm birth was attenuated: Women who reported an unwanted pregnancy—but not those who reported being unsure about the pregnancy or those who considered their pregnancy mistimed—were at higher risk of preterm birth than were women who reported an intended pregnancy (odds ratio, 1.5 in each model). Adding age or parity did not influence the observed association

between any of the pregnancy intention categories and preterm birth risk, and did not make a significant contribution to the model with pregnancy intention alone, according to the log-likelihood ratio test (not shown). Adjusting for all socioeconomic factors simultaneously resulted in nonsignificant odds ratios for all categories of pregnancy intention among white women.

Adjustment for individual socioeconomic factors did not appreciably influence the association between pregnancy intention and preterm birth among immigrant Latina women (Table 4). However, adjustments for maternal education, paternal education, age, marital status and parity made significant contributions to variation in preterm birth risk, according to the log-likelihood ratio tests. After adjustment for all socioeconomic factors simultaneously, immigrant Latina women who reported being unsure about their pregnancy remained at an increased risk of preterm birth (odds ratio, 1.5).

DISCUSSION

Utilizing population-based information from a diverse sample of postpartum women in California, our study demonstrates that the relationship between pregnancy intention and preterm birth varies by women's racial or ethnic group. After adjustment for the socioeconomic and demographic variables in our study, pregnancy intention

TABLE 4. Odds ratios (and 95% confidence intervals) from logistic regression analyses assessing the relationship between preterm birth and pregnancy intention among immigrant Latina women

Characteristic	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6†
Pregnancy intendedness						
Unsure	1.63 (1.19–2.23)	1.60 (1.17–2.19)	1.62 (1.18–2.22)	1.58 (1.15–2.15)	1.57 (1.15–2.16)	1.49 (1.08–2.06)
Unwanted	1.39 (0.99–1.93)	1.36 (0.97–1.89)	1.38 (0.99–1.93)	1.33 (0.95–1.87)	1.37 (0.98–1.92)	1.24 (0.87–1.76)
Mistimed	1.05 (0.81–1.36)	1.03 (0.80–1.34)	1.07 (0.83–1.34)	1.03 (0.80–1.33)	1.03 (0.79–1.32)	1.03 (0.80–1.34)
Intended (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Family income (as % of federal poverty level)						
0–100	na	1.88 (0.75–4.70)	na	na	na	1.27 (0.46–3.54)
101–200	na	1.89 (0.75–4.78)	na	na	na	1.45 (0.52–4.02)
201–300	na	1.59 (0.56–4.50)	na	na	na	1.42 (0.48–4.23)
301–400	na	1.16 (0.32–4.15)	na	na	na	1.08 (0.28–4.13)
≥401 (ref)	na	1.00	na	na	na	1.00
Unknown	na	2.19 (0.85–5.60)	na	na	na	1.46 (0.51–4.13)
Education						
<high school	na	na	1.44 (0.85–2.44)	na	na	1.07 (0.55–2.07)
High school/GED	na	na	1.23 (0.72–2.10)	na	na	0.97 (0.50–1.86)
Some college	na	na	1.10 (0.61–2.00)	na	na	0.93 (0.47–1.83)
≥college graduate (ref)	na	na	1.00	na	na	1.00
Education of the baby's father						
<high school	na	na	na	2.36 (1.19–4.69)	na	2.04 (0.97–4.31)
High school/GED	na	na	na	2.08 (1.03–4.23)	na	1.89 (0.89–4.01)
Some college	na	na	na	1.97 (0.90–4.32)	na	1.86 (0.84–4.14)
≥college graduate (ref)	na	na	na	1.00	na	1.00
Unknown	na	na	na	2.87 (1.36–6.04)	na	2.31 (1.03–5.18)
Marital status						
Unmarried	na	na	na	na	1.31 (1.06–1.61)	1.21 (0.96–1.52)
Married (ref)	na	na	na	na	1.00	1.00
–2 log likelihood# (difference in df)	2,720.54	5.21	24.9***(3)	10.53*(4)	42.6***(1)	73.51***(18)

*p≤.05. ***p≤.001. †Model includes age and parity; results for these characteristics are not shown because they did not affect the association between preterm birth and pregnancy intention. #For model 1, the test compared the full model with the intercept-only model; the remaining models are compared with model 1. Notes: ref=reference group. na=not applicable. The analyses accounted for population weights.

was significantly related to preterm birth among immigrant Latinas, but not among white, black or U.S.-born Latina women. These findings both conflict with and support previous studies that found that the association between unintended pregnancy and other maternal and infant health outcomes disappeared after adequate adjustment for socioeconomic factors.^{3–6} The unique pattern observed among immigrant Latinas suggests that the socioeconomic factors we measured may play different roles in relation to pregnancy intention and preterm birth for different groups of women. This finding is consistent with the poorly understood but widely observed paradox of good birth outcomes among Latinas, despite high levels of socioeconomic disadvantage.^{43–47}

Limitations

Several limitations of this study should be noted. First, our study is cross-sectional, limiting our ability to make causal inferences about the relationship between unintended pregnancy or socioeconomic factors and preterm birth. Another limitation, noted earlier, is the retrospective measurement of unintended pregnancy, which can be resolved only with a longitudinal study design. Similarly, although our measure of preterm birth came from birth certificates, it was based in part on the mother's report of her last menstrual period, which may be subject to

reporting error.^{48,49} Further, despite the large sample size overall, we had insufficient numbers of Native American and U.S.-born Asian women for analysis, and our sample of Asian immigrants may not have been representative of this population statewide. Also, we focused on socioeconomic factors that might confound the relationship between unintended pregnancy and preterm birth; other, unmeasured determinants of preterm birth may also vary by racial or ethnic group.

In interpreting this study's findings, it is important to keep in mind that we analyzed data only on pregnancies ending in live births (as did the studies of preterm birth discussed previously). In a setting where abortion is legal and largely accessible, as it is here in the United States, one could argue that women with truly unwanted pregnancies obtain abortions.⁵⁰ To the extent that abortion is safe and accessible, analyses of live births involve only a subset of unintended pregnancies—those on the “more desirable” end of the spectrum. Abortions that are denied to women, however, can have the most serious consequences for mother and child. In fact, longitudinal European studies of women who had abortion requests denied have found severe negative effects on the children's long-term psychosocial development.^{51,52} Where abortion is illegal and unsafe, unintended pregnancy is a major contributor to maternal morbidity and

mortality.^{53,54} In our study, the exclusion of terminated pregnancies may explain both the differential association and the lack of association between unintended pregnancy ending in live births and preterm birth, given that abortion rates vary by racial or ethnic group.¹

Conclusion

These findings have several important implications for research, as well as for program and policy development. They call into question the belief in an association between unintended pregnancy and preterm birth, at least among certain racial and ethnic groups, and they suggest that studies of pregnancy intention and preterm birth cannot be generalized across racial or ethnic groups, perhaps because of variations across groups in social experiences. Our findings also add to concerns about the measurement and meaning of unintended pregnancy, particularly among diverse populations. Although the varied meanings of the conventional pregnancy intention categories have been explored qualitatively,^{24,30} more research is needed, particularly among immigrant Latina women. Longitudinal investigations of how pregnancy intentions might change over time, whether the direction of change varies by racial or ethnic group or by socioeconomic factors, and how pregnant women's social and health care context shapes their stated intentions would seem promising. Such inquiries could help us achieve a more nuanced understanding of women's pregnancy goals and desires, which in turn could inform the development of alternative and more meaningful measures of pregnancy intention.

To the extent that our study suggests an association between socioeconomic factors and the risk of preterm birth, programs and policies need to address women's socioeconomic conditions to have an impact on their risk of preterm birth. To the extent that the current understanding of pregnancy intention has meaning and implications for maternal and infant health, efforts should be made to ensure women's access to reproductive health care, including by preserving public health safety net measures for immigrants, to have an impact on both women's fertility goals and their risk of preterm birth.

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