# Sexual Orientation Disparities in Mistimed and Unwanted Pregnancy Among Adult Women

***CONTEXT:*** *Many sexual minority women, regardless of sexual identity, engage in heterosexual behavior across the life course, which provides them opportunities to experience an unintended pregnancy. In addition, sexual minority women are more likely than others to report characteristics that may make them vulnerable to unintended pregnancy. Little research, however, has examined whether the risk of unintended pregnancy is elevated among these women.*

***METHODS:*** *Using data from the 2006–2010 National Survey of Family Growth, logistic regression models were fitted to examine sexual orientation disparities in mistimed and unwanted pregnancies among 9,807 women aged 20–45; mixed-effects hazard models assessed disparities in the intention status of 5,238 pregnancies among these women by maternal sexual orientation.*

***RESULTS:*** *Compared with heterosexual women reporting only male partners, heterosexual women who have sex with women had higher odds of reporting a mistimed pregnancy (odds ratio, 1.4), and bisexual women had higher odds of reporting an unwanted pregnancy (1.8). When compared with pregnancies reported by heterosexual women with only male partners, those reported by heterosexual women who have sex with women were more likely to be mistimed (hazard ratio, 1.7), and those reported by bisexual and lesbian women were more likely to be unwanted (1.7–4.4).*

***CONCLUSIONS:*** *Compared with heterosexuals who have sex with men only, adult sexual minority women are at equal or greater risk of reporting an unintended pregnancy. More research addressing the reproductive health care needs of sexual minority women is needed to develop strategies to improve family planning for this population.*

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Unintended pregnancies, typically defined as pregnancies that were mistimed or unwanted, are an alarmingly common facet of reproductive life. Studies have shown that 49–51% of all pregnancies in the United States are unintended,[1,2] and that the number of births resulting from intended pregnancies is decreasing while the number of births resulting from unintended pregnancies is increasing.[3] Such statistics are cause for concern, given that unintended pregnancy has been linked to adverse maternal and infant health outcomes, including increased risks for delayed prenatal care,[4,5] low birth weight and premature delivery.[5,6] Previous research has demonstrated that unintended pregnancies are not randomly distributed across the population; rather, disparities in pregnancy intentions fall along social fault lines that reflect dimensions of inequality, such as race, ethnicity, socioeconomic status and sexual orientation.[1,7–14]

Sexual orientation disparities in pregnancy intentions have been studied in adolescent populations[8–12] and in clinical or convenience samples of adult women,[13,14] but not among adult women at the national level. In addition, while the prevalence of sexual risk behaviors and STDs is known to vary within the sexual minority population,[15–18] whether similar disparities extend to pregnancy intentions is not clear. This study, therefore, addresses an important gap in the reproductive health literature by using a nationally representative sample of adults to investigate disparities in pregnancy intentions across multiple sexual orientation populations.

## BACKGROUND

Sexual orientation is a multidimensional construct that includes an individual's sexual identity, romantic and sexual attractions, and sexual behaviors.[19,20] Almost 20% of U.S. women of reproductive age identify as a sexual minority or have engaged in same-sex sexual relationships.[19]

Although fertility estimates are difficult to calculate for the sexual minority population, previous studies have estimated that 26–41% of lesbians and 29–81% of bisexual women have experienced at least one pregnancy.[21–23] Some sexual minority women become pregnant by using assisted reproductive technologies; however, many engage in heterosexual sex across the life course[20] and thus have opportunities to experience pregnancy, both intended and unintended, outside the context of such technologies. For example, using a nationally representative sample of women aged 18–59, Xu et al. showed that on average, bisexual women reported having had 17.6 male sexual partners, lesbians reported 2.9 and heterosexual women who have sex with women reported 10.8, whereas heterosexual women who have sex only with men reported 3.8.[16]

In addition, sexual minority women are more likely than others to report characteristics that may make them vulnerable to an unintended pregnancy. Minority stress theory highlights that compared with heterosexual women, sexual minority women are more likely to report victimization,[24–26] including having been sexually assaulted.[17,18,27,28] Victimization, particularly sexual victimization, has been linked to sexual risk behaviors and increased risk of unintended pregnancy.[29,30]

Early sexual debut may also contribute to increased risk of unintended pregnancy among sexual minorities. Sexual minority youth describe pressures to conform to heterosexual norms and expectations in their sexual and romantic lives.[31] As a result, they may engage in heterosexual sex as a way to avoid being stigmatized by peers and family members.[11,32] Furthermore, sexual minorities report earlier sexual debut than their heterosexual peers. One study, using nationally representative data, found that 30% of women who reported same-sex partners had first had sex before the age of 15, compared with 12% of women reporting only male partners.[16] Among heterosexual populations, earlier sexual debut has been linked to a variety of sexual risk behaviors and negative sexual health outcomes.[33,34] Associations of victimization and early sexual debut with adult sexual minority women's unintended pregnancy risk are unclear.

Teenage pregnancy is generally considered to be unintended; research demonstrates a higher risk of teenage pregnancy among sexual minority adolescents than among their heterosexual peers.[8–12,32,35] Using a large multigenerational data set, Charlton et al. showed that among the younger cohorts, lesbian, bisexual or heterosexual women who have sex with women were more likely to report a teenage pregnancy than were heterosexual women with only male partners.[8] Lindley and Walsemann examined data from New York City high schools and found that bisexual or lesbian young women, and young women who had sex with both male and female partners, were more likely to report a teenage pregnancy than were heterosexuals or women with only male partners.[10] Because of the construction of the sexual identity survey item, however, this study was unable to assess risk of bisexual and lesbian young women independently.[10] Finally, using nationally representative data, Goldberg et al. showed that young women who identified as bisexual were more likely, and those who identified as lesbian were less likely, to report a teenage pregnancy than were exclusively heterosexual young women.[9]

Only two studies, to our knowledge, have examined unintended pregnancies among adult sexual minority women. Using a community-based sample, Everett et al. showed that 24% of sexual minority women reported at least one unintended pregnancy; 44% of these pregnancies were reported by women who identified as lesbian.[13] The second study examined disparities in sexual health outcomes by same-sex behavior and included women aged 16–29 who presented in family planning clinics.[14] This study showed that behaviorally bisexual women were more likely to report an unwanted pregnancy than were women who had had sex only with men (36% vs. 21%).[14] This study did not examine differences by identity or stratify by age to limit the results to an adult sample. Further, neither of these studies used a heterosexual comparison group to determine group-level differences in pregnancy risk. Thus, important questions remain regarding adult sexual minority women's unintended pregnancy risk and how risk varies within the sexual minority population.

## STUDY AIMS

Using the National Survey of Family Growth (NSFG), we address the following research questions. First, are lesbian, bisexual or heterosexual women who have sex with women more likely to report mistimed or unwanted pregnancies than heterosexual women with only male partners? Second, are sexual orientation disparities in pregnancy intention accounted for by differences in age at sexual debut or forced sex?

We focus on two dimensions of sexual orientation, identity and behavior, for several reasons. First, social identities are unique structures that establish norms for behavior and confer different sets of risks and protections.[36] Second, we include data on same-sex behavior because of previously established associations with correlates of unintended pregnancy among heterosexual women who have sex with women.[8,15–18] We differentiate between pregnancies that were reported as mistimed (i.e., occurred too soon) and ones that were reported as unwanted, regardless of timing, because previous studies have demonstrated important differences in pregnancy outcomes associated with these variables.[37,38] Also, we examine two variables associated with sexual health risks—early age at sexual debut and forced sex—that have been shown to disproportionately affect sexual minority women.

## METHODS

### Data

Data are from the 2006–2010 NSFG, which was based on a probability sample of the U.S. household population aged 15–44.[39] A total of 12,279 women were surveyed; the overall response rate for women was 78%. For questions related to sensitive topics (e.g., sexual behavior histories, drug use, victimization), computer-assisted personal interviewing was used. All other survey items were asked during face-to-face interviews.

We use both women and reported pregnancies in the past five years as the units of analysis. Using women allows us to determine population-level disparities in reports of mistimed or unintended pregnancy. Many sexual minority women, in particular lesbians who have sexual relationships exclusively with women, may have little or no risk of pregnancy. An analysis based only on pregnancies would exclude this group and might result in an inaccurate portrait of overall unintended pregnancy risk among sexual minority women. We are also interested in disparities in intendedness among pregnancies that end in live births or miscarriages. Understanding whether pregnancies reported

by sexual minority women are more likely to be unwanted or mistimed than those reported by heterosexual women is a step toward informing targeted care for this population. Using pregnancies as the unit of analysis allows us to maximize our sample size and to correctly order important variables, such as maternal age and forced sex, temporally.

Our sample excludes 2,284 women because they were younger than 20 at the time of interview. We also exclude 188 women because they had missing data on either the sexual identity or the sexual behavior survey item. Our final sample thus comprises 9,807 women.

A total of 20,492 pregnancies were reported in the NSFG. Of these, 18,031 ended in live birth or miscarriage, or were ongoing. We exclude 2,295 pregnancies reported as ending in termination (because of the high level of known underreporting*), as well as 166 ectopic pregnancies. Because we are interested in adult women, we also eliminate the 4,647 pregnancies that occurred when women were younger than 20 and the 8,146 that occurred more than five years prior to the interview. The final sample consists of 5,238 pregnancies.

## Measures

***•Sexual orientation.*** We used two measures of sexual orientation: sexual identity and same-sex behavior. Respondents were asked, "Do you think of yourself as: heterosexual or straight; homosexual, gay or lesbian; or bisexual?" Participants were also asked if they had ever had sexual experience of any kind with another female. From these two survey items, four mutually exclusive categories were created: heterosexual women with only male partners, heterosexual women who have sex with women, bisexual women and lesbian women.†

***•Pregnancy intentions.*** The NSFG provides data on both pregnancies that were mistimed and ones that were unwanted at any time. Respondents were asked if their pregnancy occurred too soon, at the right time or later than they wanted; they also were asked if, before they became pregnant, they had wanted to have a baby at any time in the future.

For our analysis based on women, we created dummy variables that captured whether a woman reported having an unwanted pregnancy (i.e., that before conception, she had not wanted to have a baby at any time) and whether a woman reported a mistimed pregnancy (i.e., one that had occurred sooner than she would have liked). Similarly, for analyses based on pregnancies, intentions were recoded into two dummy variables. The first captured pregnancies that were unwanted, and the second captured pregnancies that were mistimed.

***•Risk-related characteristics.*** Early sexual debut was derived from a measure that asked respondents about the first time they ever had vaginal intercourse. First intercourse that occurred at age 14 or younger was coded as early debut.[16,40]

Forced sex was coded in two ways. First, we coded it as a dummy variable using responses to the question "Have you, at any time in your life, ever been forced by a male to have vaginal intercourse against your will?" Women answering yes were coded as having experienced forced sex. Second, for the sample of pregnancies, respondents who answered "yes" to the question on forced sex were then asked how old they were the first time forced sex happened. On the basis of this information, we created a variable indicating whether forced sex had occurred prior to conception.

***•Additional covariates.*** Previous research has found that racial and ethnic minorities,[2] women with relatively low levels of education,[41] younger women[2] and women with previous pregnancies[7] are more likely than others to report unintended pregnancies, so we included these characteristics as covariates in our models.

Race and ethnicity was assessed using two survey items. One asked participants if they were Hispanic, Latina or of Spanish origin; the other asked them to identify the group that best describes their race (American Indian or Alaska Native; Asian, Native Hawaiian or other Pacific Islander; black or African American; or white). We created four dummy variables, indicating whether respondents were white, black, Hispanic or of another background.

Education was measured using two survey items that asked women the highest grade they had attended in school and if they had attended college or had a university degree. We coded education into three dummy variables that capture whether respondents reported having graduated from high school, having attended college or having received a college degree.

Age at time of interview was included as a categorical variable (20–24, 25–29, 30–34, 35–39 or 40–44). For analyses based on pregnancies, we included a control for maternal age at conception, coded in the same way.

For analyses based on pregnancies, we included a control for parity, which was coded as a continuous variable (range, 0–15).

The NSFG also asks women about their feelings regarding each reported pregnancy in the past three years. They described how they felt when they found out they were pregnant, using a scale of 1–10 (from "very unhappy" to "very happy"). Because this survey item is restricted to pregnancies that occurred in the past three years, it is only analyzed descriptively in supplementary analyses.

## Analysis

We first calculated descriptive statistics for the sample overall and stratified by sexual orientation. Then, t tests were used to identify statistically significant differences

*NSFG guidelines explicitly state that the survey's abortion data should not be used for substantive research.

†When we looked at behavior, we found that 64 bisexual and 11 lesbian women had not had sex with a woman, and 17 bisexual and 44 lesbian women had not had sex with a man. Additional analyses with more detailed categories showed no statistical differences among bisexual women by sexual behaviors; analyses attempting to disaggregate the lesbian population by behavior were unsuccessful because of sample size limitations.

***TABLE 1. Selected characteristics of women aged 20–45 and of pregnancies they reported having occurred in the past five years, by respondents' sexual orientation, National Survey of Family Growth, 2006–2010***

| Characteristic | All | Heterosexual women with male partners only | Heterosexual women who have sex with women | Bisexual | Lesbian |
|---|---|---|---|---|---|
| WOMEN | (N=9,807) | (N=8,188) | (N=1,030) | (N=431) | (N=158) |
| **Pregnancy intendedness** | | | | | |
| Mistimed | 8.2 | 7.9 | 11.5** | 8.8 | 5.1 |
| Unwanted | 5.8 | 5.6 | 5.5 | 11.5** | 3.3 |
| **Forced sex‡** | 15.8 | 12.8 | 35.9*** | 29.7** | 19.3 |
| **Early sexual debut§** | 13.8 | 11.6 | 26.4*** | 29.2** | 21.9† |
| **Age at interview** | | | | | |
| 20–24 | 20.3 | 19.1 | 24.1† | 35.4* | 29.9 |
| 25–29 | 20.6 | 20.1 | 22.5† | 28.1 | 17.7 |
| 30–34 | 18.0 | 17.9 | 18.3† | 16.7 | 22.7 |
| 35–39 | 20.4 | 21.2 | 17.9† | 12.1* | 11.9** |
| 40–45 | 20.6 | 21.6 | 16.8† | 7.2** | 17.7 |
| **Race/ethnicity** | | | | | |
| White | 63.5 | 61.4 | 78.3** | 76.9* | 52.2** |
| Black | 14.1 | 14.3 | 12.6 | 12.3 | 24.4 |
| Hispanic | 15.4 | 16.9 | 6.4*** | 6.7** | 15.6 |
| Other | 6.9 | 7.5 | 2.7* | 4.1 | 7.8 |
| **Education** | | | | | |
| High school graduate | 33.8 | 33.3 | 33.6 | 46.1** | 33.4 |
| Some college | 27.8 | 26.9 | 33.3* | 35.3* | 24.0 |
| College graduate | 38.4 | 39.8 | 33.1* | 18.6*** | 42.7 |
| PREGNANCIES | (N=5,238) | (N=4,541) | (N=476) | (N=199) | (N=22) |
| **Intendedness** | | | | | |
| Intended | 66.9 | 68.6 | 55.8*** | 51.8** | 35.0* |
| Mistimed | 19.4 | 18.3 | 28.6** | 21.3 | 35.2 |
| Unwanted | 13.7 | 13.1 | 15.6 | 27.0** | 29.8* |
| **Forced sex‡‡** | 14.9 | 11.9 | 34.8*** | 34.7** | 27.4 |
| **Mean parity** | 2.9 | 2.8 | 3.1† | 3.2 | 2.5 |
| **Maternal age** | | | | | |
| 20–24 | 28.7 | 26.8 | 37.6** | 68.8* | 67.8 |
| 25–29 | 31.4 | 31.0 | 32.2 | 31.6 | 26.8 |
| 30–34 | 24.2 | 26.4 | 12.1*** | 6.3* | 10.1* |
| 35–39 | 13.7 | 13.6 | 16.3 | 8.3 | 8.0 |
| 40–45 | 2.0 | 2.2 | 1.8 | 1.5** | 3.2** |

*p<.05. **p<.01. ***p<.001. †p<.10. ‡Ever experienced forced sex. §First intercourse at age 14 or younger. ‡‡Experienced forced sex before pregnancy.
*Notes:* Unless otherwise noted, data are percentages. Percentages may not add to 100.0 because of rounding.

between the responses of sexual minority respondents and those of heterosexual women with only male partners.

Next, for the sample of women, we used logistic regression to examine sexual orientation disparities in reporting mistimed or unwanted pregnancy. For the sample of reported pregnancies, we used mixed-effects Cox proportional hazard modeling, a common choice for analyzing event-history data. Because the risk of becoming pregnant is not consistent over time (e.g., women are not at risk of becoming pregnant while they are pregnant), and because an individual woman may report multiple pregnancies, resulting in correlation in error terms, we employed mixed-effect Cox regressions using the *coxme* package in R. These models are flexible and require few assumptions about the shape of the hazard curve.[42] The *coxme* package allows for the incorporation of a random effect, as with other multilevel approaches, and assumes a Gaussian distribution (fit using maximum likelihood). Furthermore, the models take into account the dichotomous outcome variables while incorporating hazard functions that adjust for time until pregnancy, the duration variable. Following Guzzo and Hayford, our duration variable begins at age 12, the average age at menarche, and goes through age at first pregnancy after age 20.[43] For women who reported multiple pregnancies, the duration variable for a repeat pregnancy began at the age when one pregnancy ended and ended at the age when the next one began (range, 0–28 years).

For each sample, the first model is a bivariate analysis. Model 2 includes sociodemographic controls, and model 3 additionally adjusts for forced sex and early sexual debut. Analyses of mistimed pregnancies exclude unwanted ones, and analyses of unwanted pregnancies exclude mistimed ones.

Because pregnancy intentions have been linked to adverse infant outcomes such as low birth weight and preterm birth,[4–6] disparities in intention among live births may have important clinical implications for infant outcomes among

***TABLE 2. Odds ratios (and standard errors) from logistic regression analyses assessing women's likelihood of reporting that a pregnancy in the past five years was mistimed or unwanted, by selected characteristics***

| Characteristic | Mistimed | | | Unwanted | | |
|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| **Sexual orientation** | | | | | | |
| Heterosexual women with male partners only (ref) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heterosexual women who have sex with women | 1.52 (0.23)*** | 1.43 (0.22)* | 1.36 (0.22)† | 0.98 (0.19) | 1.00 (0.21) | 0.92 (0.19) |
| Bisexual | 1.13 (0.24) | 0.85 (0.24) | 0.79 (0.17) | 2.19 (0.51)*** | 1.99 (0.45)** | 1.84 (0.44)* |
| Lesbian | 0.62 (0.58) | 0.54 (0.69) | 0.54 (0.51) | 0.57 (0.23) | 0.57 (0.23) | 0.53 (0.21) |
| **Age at interview** | | | | | | |
| 20–24 | na | 1.03 (0.16) | 1.03 (0.16) | na | 0.36 (0.06)*** | 0.36 (0.06)*** |
| 25–29 | na | 1.57 (0.23)** | 1.56 (0.15)** | na | 1.17 (0.17) | 1.15 (0.17) |
| 30–34 (ref) | na | 1.00 | 1.00 | na | 1.00 | 1.00 |
| 35–39 | na | 0.48 (0.09)*** | 0.48 (0.20)*** | na | 0.75 (0.14) | 0.75 (0.13) |
| 40–45 | na | 0.16 (0.05)*** | 0.16 (0.50)*** | na | 0.45 (0.10)*** | 0.45 (0.10)*** |
| **Race/ethnicity** | | | | | | |
| White (ref) | na | 1.00 | 1.00 | na | 1.00 | 1.00 |
| Black | na | 1.27 (0.13)* | 1.28 (0.16)* | na | 2.42 (0.30)*** | 2.36 (0.29)*** |
| Hispanic | na | 1.15 (0.13) | 1.20 (0.15) | na | 1.69 (0.25)*** | 1.76 (0.25)*** |
| Other race | na | 1.22 (0.20) | 1.31 (0.25) | na | 2.26 (0.53)*** | 2.25 (0.52)*** |
| **Education** | | | | | | |
| College graduate (ref) | na | 1.00 | 1.00 | na | 1.00 | 1.00 |
| High school graduate | na | 1.96 (0.26)*** | 1.90 (0.26)*** | na | 3.60 (0.59)*** | 3.35 (0.55)*** |
| Some college | na | 1.47 (0.20)** | 1.44 (0.19)** | na | 2.81 (0.53)*** | 2.68 (0.50)*** |
| **Forced sex‡** | na | na | 1.15 (0.18) | na | na | 1.44 (0.24)* |
| **Early sexual debut§** | na | na | 1.13 (0.18) | na | na | 1.32 (0.22)† |

*p<.05.**p<.01.***p<.001.†p<.10.‡Ever experienced forced sex.§First intercourse at age 14 or younger.*Notes:* ref=reference group.na=not applicable.

sexual minority women. Thus, supplementary analyses were conducted that restricted pregnancies to those that ended in live birth. In addition, given high levels of sexual fluidity among sexual minority women,[44,45] and to ensure that the identity reported at the time of the survey matched that at the time of pregnancy, sensitivity analyses were conducted with a shortened time frame of three years between reported pregnancies and interview. Finally, we examined whether reported feelings of happiness about pregnancy varied across sexual orientations. All analyses were run in the statistical program R and adjusted for the complex sampling design of the NSFG.

## RESULTS

### Characteristics by Sexual Orientation

Eighty-five percent of respondents were heterosexual women with only male partners, 10% were heterosexual women who have sex with women, 4% were bisexual and 1% were lesbian. Eight percent of the sample reported at least one mistimed pregnancy in the past five years, and 6% reported at least one unwanted pregnancy in the same time frame (Table 1). However, bivariate analyses revealed that 12% of heterosexual women who have sex with women reported a mistimed pregnancy, compared with 8% of heterosexual women with only male partners. Also, bisexual women were more likely than heterosexual women with only male partners to report an unwanted pregnancy (12% vs. 6%). No other differences in pregnancy intentions were detected.

Results stratified by sexual orientation also show differences in characteristics related to unintended pregnancy risk. Heterosexual women who have sex with women and bisexual women were more likely than heterosexual women with only male partners to report forced sex (30–36% vs. 13%) and early sexual debut (26–29% vs. 12%). Lesbians were marginally more likely than heterosexual women with only male partners to report early sexual debut (22% vs. 12%).

Eighty-seven percent of pregnancies were reported by heterosexual women with only male partners, 9% by heterosexual women who have sex with women, 4% by bisexual women and fewer than 1% by lesbian women. Sixty-seven percent of reported pregnancies that ended in miscarriage or live birth were intended, 19% were mistimed and 14% were unwanted at the time of conception. Compared with pregnancies reported by heterosexual women with only male partners, those reported by heterosexual women who have sex with women were more likely to be described as mistimed (29% vs. 18%), while those reported by bisexual women and lesbian women were more likely to be described as unwanted (27–30% vs. 13%).

### Multivariate Models

***•Women as unit of analysis.*** In the initial regression model, heterosexual women who have sex with women were more likely than heterosexual women with only male partners to report a mistimed pregnancy in the past five years (odds ratio, 1.5—Table 2). The association remained

***TABLE 3. Hazard ratios (and standard errors) from mixed-effects hazard models assessing the likelihood of a pregnancy's being reported as mistimed or unwanted, by selected maternal characteristics***

| Characteristic | Mistimed | | | Unwanted | | |
|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| **Sexual orientation** | | | | | | |
| Heterosexual women with male partners only (ref) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heterosexual women who have sex with women | 2.24 (0.15)*** | 1.64 (0.15)*** | 1.68 (0.15)*** | 1.81 (0.19)** | 1.35 (0.20) | 1.30 (0.20) |
| Bisexual | 2.06 (0.25)** | 1.22 (0.24) | 1.27 (0.24) | 2.81 (0.26)*** | 1.75 (0.26)* | 1.65 (0.26)* |
| Lesbian | 1.36 (0.88)*** | 1.04 (0.78) | 1.00 (0.78) | 6.67 (0.64)** | 4.64 (0.61)* | 4.36 (0.61)* |
| **Parity** | na | 2.07 (0.03)*** | 2.09 (0.03)*** | na | 2.39 (0.04)*** | 2.36 (0.04)*** |
| **Maternal age** | | | | | | |
| 20–24 | na | 9.51 (0.15)*** | 9.68 (0.15)*** | na | 7.40 (0.18)*** | 7.33 (0.18)*** |
| 25–29 | na | 2.26 (0.14)*** | 2.28 (0.14)*** | na | 2.15 (0.16)*** | 2.13 (0.16)*** |
| 30–34 (ref) | na | 1.00 | 1.00 | na | 1.00 | 1.00 |
| 35–39 | na | 0.80 (0.19) | 0.80 (0.19) | na | 0.93 (0.19) | 0.93 (0.19) |
| 40–45 | na | 0.30 (0.49)* | 0.30 (0.49)* | na | 0.83 (0.33) | 0.83 (0.32) |
| **Race/ethnicity** | | | | | | |
| White (ref) | na | 1.00 | 1.00 | na | 1.00 | 1.00 |
| Black | na | 1.21 (0.12) | 1.22 (0.12) | na | 1.92 (0.15)*** | 1.92 (0.15)*** |
| Hispanic | na | 1.11 (0.13) | 1.10 (0.13) | na | 1.31 (0.16)† | 1.34 (0.16) |
| Other | na | 1.36 (0.20) | 1.35 (0.20) | na | 1.97 (0.24)** | 2.00 (0.24)** |
| **Education** | | | | | | |
| College graduate (ref) | na | 1.00 | 1.00 | na | 1.00 | 1.00 |
| High school graduate | na | 1.24 (0.13)† | 1.26 (0.13)† | na | 2.38 (0.17)*** | 2.38 (0.17)*** |
| Some college | na | 1.31 (0.13)* | 1.32 (0.13)* | na | 2.31 (0.18)*** | 2.32 (0.18)*** |
| **Forced sex‡** | na | na | 0.98 (0.13) | na | na | 1.19 (0.15) |
| **Early sexual debut§** | na | na | 0.83 (0.13) | na | na | 0.99 (0.14) |
| *Random effect SD* | *1.29* | *1.14* | *1.14* | *1.51* | *1.41* | *1.40* |

*p<.05. **p<.01. ***p<.001. †p<.10. ‡Experienced forced sex before pregnancy. §First intercourse at age 14 or younger. *Notes:* ref=reference group. na=not applicable. SD=standard deviation.

after adjustment for sociodemographic characteristics (1.4); it was only marginally significant in the model controlling for forced sex and age at sexual debut. No differences were detected in comparisons involving bisexual or lesbian women.

Bisexual women were more likely to report an unwanted pregnancy than were heterosexual women with only male partners (odds ratio, 2.2); this relationship persisted after adjustment for sociodemographic characteristics (2.0) and risk-related characteristics (1.8). As with mistimed pregnancies, no differences were detected between heterosexual women with only male partners and lesbian women.

***•Pregnancy as unit of analysis.*** Pregnancies reported by women in each sexual minority category were more likely to be mistimed than were those reported by heterosexual women with only male partners (hazard ratios, 1.4–2.2; Table 3). After adjustment for sociodemographic characteristics, only pregnancies among heterosexual women who have sex with women still had an elevated risk of being mistimed (1.6); the association persisted after adjustment for forced sex and early sexual debut (1.7).

Pregnancies reported by all categories of sexual minority women were more likely to be unwanted than were pregnancies reported by heterosexual women with only male partners (hazard ratios, 1.8–6.7). Including controls for sociodemographic characteristics eliminated the association for pregnancies reported by heterosexual women who have sex with women. However, pregnancies among bisexual and lesbian women continued to have an elevated risk of being unwanted after this adjustment (1.8–4.6) and after the inclusion of risk-related characteristics (1.7–4.4).

## Supplementary Analyses

We conducted a series of analyses restricted to the 4,233 pregnancies that ended in live births. Compared with pregnancies among heterosexual women with only male partners, pregnancies among heterosexual women who have sex with women were more likely to be mistimed (hazard ratio, 1.7; p<.05), and pregnancies among lesbians were more likely to be unwanted (4.0; p<.05); the finding for unwantedness was marginally significant for pregnancies among bisexual women (1.7; p<.10).

Results from analyses that restricted pregnancies to those reported in the last three years were similar to those presented in the tables: Fully adjusted models revealed that pregnancies reported by heterosexual women who have sex with women and by bisexual women were more likely to be described as mistimed than were pregnancies reported by heterosexual women with only male partners (hazard ratios, 1.6 and 1.7; p<.05 for both). Similarly, pregnancies reported by

lesbian women and bisexual women were more likely to be unwanted than were those reported by heterosexual women with only male partners (5.8 and 2.0; p<.05 for both).

Sensitivity analyses showed that mean happiness levels were significantly lower among heterosexual women who have sex with women (7.1; 95% confidence interval [CI], 6.6–7.6) and among bisexual women (6.4; CI, 5.5–7.2) than among heterosexual women with only male partners (8.3; CI, 8.1–8.4). Lesbians reported low levels of happiness about their pregnancy, but the mean (6.6; CI, 4.7–8.6) was not significantly different from that for heterosexual women with only male partners.

## DISCUSSION

Given the social and economic consequences of unintended pregnancy, understanding populations at greatest risk for this outcome is of critical public health and social importance. Our findings offer a glimpse into the reproductive intentions of an overlooked group of women and suggest an elevated risk of unintended pregnancy among sexual minority women in adulthood.

We observed differences by sexual orientation in women's reporting of whether pregnancy was mistimed or unwanted, which may reflect underlying differences in family formation preferences. Compared with heterosexual women who have only male partners, heterosexual women who have sex with women were more likely to report a pregnancy as occurring too soon, and bisexual and lesbian women were much more likely to report a pregnancy as unwanted. Women who have unwanted pregnancies are more likely to feel negative or ambivalent about their pregnancies than are women who have mistimed pregnancies.[46] Further, studies have shown that unwanted pregnancies are associated with poorer maternal health and infant outcomes than both intended and mistimed pregnancies.[37,38] The finding that bisexual and lesbian women are more likely to describe their unintended pregnancies as unwanted, while heterosexual women who have sex with women are more likely to describe their unintended pregnancies as mistimed, may have important implications for sexual orientation disparities in infant outcomes. In addition, some research has found that pregnancy among lesbians is stigmatized by heterosexual friends and family members, as well as sexual minority peers.[11,47] For some sexual minority women, particularly gender-nonconforming women, pregnancy may be seen as a sign of normative transgression, even within the lesbian community.[48] Pregnancy may be particularly stressful for sexual minority women as it can place them in an even more socially precarious position and make them even more vulnerable to victimization and discrimination.[49] This combination of factors may explain, in part, why lesbian women are more likely to report that their unintended pregnancies were unwanted, rather than mistimed.

Furthermore, even in cases in which the pregnancy eventually becomes desired, unintended pregnancies are linked to delayed prenatal care use and low birth weight.[5] This, coupled with previous research findings that sexual minority women are less likely than others to use reproductive services and more likely to have unmet medical needs,[48,50–52] suggests that when it comes to accessing prenatal care, these women may be doubly disadvantaged.

Why are sexual minority women particularly vulnerable to unwanted pregnancy? Although we tested two risk-related characteristics, forced sex and early sexual debut, neither accounted for observed differences in reproductive intentions. Therefore, there may be other variables associated with heightened risk among sexual minority women that were not included in the study.

First, in line with identity control theory,[35] new research has found that incongruence between sexual identity and sexual behavior is a unique form of minority stress associated with multiple risk factors for unintended pregnancy, including depression, hazardous drinking and sexual risk behaviors.[53–55] The contexts in which sexual minority women engage in heterosexual sex may include other risk factors, making them vulnerable to unintended pregnancy.

Second, sexual minority women are less likely than others to access reproductive health services,[48,50–52,56] and lesbians, in particular, are less likely than heterosexual women to use contraceptives.[8] Further, some research suggests that lesbian and bisexual women may understand their sexual lives as inherently low-risk and immune to pregnancy risk,[48,52] which may decrease their likelihood of using contraceptives during heterosexual encounters.

Finally, sexual minorities are often not provided with medically accurate education materials that address their sexual health needs.[56] During adolescence, sexual minorities may therefore miss out on important sexual health information and lack opportunities to develop skills for healthy sexual and romantic relationships. These missed opportunities may contribute to the high rates of intimate partner violence and reproductive coercion experienced by sexual minority women,[14,56–58] and increase their risk of unintended pregnancy.

### Limitations

Several limitations may affect interpretation of our findings. Because pregnancy data are retrospective, they may suffer from recall bias. Although our results are robust to a three-year window between conception and interview, sample size limitations prohibited us from conducting analyses using a shorter window of time. Furthermore, some research has shown that the negative birth outcomes associated with a mistimed pregnancy vary according to how greatly mistimed the pregnancy was (e.g., by months versus years);[59] however, because of the relatively small size of our sample of lesbian and bisexual women, we could not examine this. The small number of lesbians also limited our ability to detect statistical significance in some models.

Our analyses do not include pregnancies that ended in termination, because of high rates of underreporting of abortion. Descriptive analysis, not presented, of NSFG pregnancy termination data shows that a greater

proportion of pregnancies reported by sexual minorities than by heterosexual women with only male partners ended in termination. Thus, the findings presented here likely underestimate sexual minority women's risk for unintended pregnancy. Also, other correlates omitted from this study may explain the observed disparities, including depression, sexual health information, substance use and abuse, intimate partner violence and reproductive coercion. Finally, more detailed investigation of the role of forced sex, as well as the role of heterosexual sex as a stigma management strategy, is needed.

## Conclusion

Despite our study's limitations, the results demonstrate that sexual minority women face elevated risks for mistimed and unwanted pregnancy compared with heterosexual women with only male partners. The results also show the importance of including measures of both identity and behavior. Given the dynamic and multifaceted nature of women's sexual orientation development over time,[44,45] more research is needed to understand the implications of the diversity of sexual and romantic partnerships among sexual minority women if their reproductive and sexual health needs are to be addressed effectively.

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