Invisible and at Risk: STDs Among Young Adult Sexual Minority Women in the United States

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CONTEXT: Sexual minority women are not adequately assessed by national STD surveillance systems, and research regarding STD burden in nationally representative samples of such women is rare. Moreover, few studies have assessed STD risk exclusively among young adult women.

METHODS: Wave 4 (2007–2008) data from the National Longitudinal Study of Adolescent Health on 7,296 females aged 24–32 were used to examine the relationship between sexual orientation and receipt of an STD diagnosis in the past year. Multivariate logistic regression analyses used two measures of sexual orientation: sexual identity and gender of sex partners.

RESULTS: Eighty percent of women considered themselves straight; 16% mostly straight; and 4% bisexual, mostly gay or gay. Eighty-five percent had had only male partners, while 7% had had one female partner, and 8% two or more female partners. In unadjusted models, women who identified themselves as mostly straight were more likely than straight women to have had an STD (odds ratio, 1.4); mostly gay or gay women were at lower risk (0.4). Women who had had two or more female partners had a higher STD risk than did women who had had only male partners (1.7). Adjusting for social and demographic characteristics did not substantially alter these results; however, the associations between sexual identity, gender of sex partners and STD diagnosis were eliminated after adjustment for sexual behaviors (e.g., having had anal sex).

CONCLUSIONS: Sexual identity, gender of sex partners and sexual behaviors should be taken into account in assessments of women's STD risk.

STDs are a significant health issue in the United States, where approximately 19 million new cases occur annually, at a cost of about $17 billion dollars to the U.S. health care system.[1] Young adults aged 25–34 are an often-overlooked risk group for STDs; although rates are highest among persons aged 15–19 and 20–24, young adults aged 25–29 and 30–34 have the third and fourth highest STD rates, respectively.[1] Understanding STD risk among young adult women aged 25–34 is particularly important, as many women start families during this stage of life. In 2009, the median age at first marriage among U.S. women was 26, and the average age at first birth was 25.[2,3] Thus, STDs—particularly those that can be transmitted during pregnancy or childbirth—threaten not only the health of young adult women and their partners, but the health of their offspring as well.

Risk factors commonly associated with STDs among young women include having had many sex partners, having concurrent partners, not using condoms with male partners, and using drugs or alcohol prior to intercourse.[4–6] Infections diagnosed among women who have had male partners are currently categorized as having occurred through "heterosexual contact" or "heterosexual transmission"; women's sexual identity and sexual behavior with other women typically are not taken into consideration.[7,8] In contrast, infections among men are often categorized as having occurred through "male-to-male sexual contact" or among "men who have sex with men."[9,10] In fact, the Centers for Disease Control and Prevention's STD Surveillance Network defines men who have sex with men as those "who either reported having a male sex partner or self-reported as gay/homosexual or bisexual."[9] Similar categories do not exist for women who have sex with women or who self-identify as gay, lesbian or bisexual.[8]

A substantial proportion (7–12%) of women aged 15–59 have had sex with another woman, and the proportion is higher still (14–16%) among young adult women (aged 20–34).[11,12] Yet few data are available regarding the risk of STD transmission between women.[13] Some sexual behaviors in which sexual minority (nonheterosexual) women frequently engage—such as sharing sex toys or having oral-genital, digital-vaginal or digital-anal contact with female partners—are likely means of STD transmission[13–15] and have been associated with trichomoniasis, HIV and bacterial vaginosis infections in women who have sex with women.[16–18] Moreover, infections with chlamydia and human papillomavirus are quite common among sexual minority women, including those who have never had sex with men.[19,20]

Only three investigations have used nationally representative samples to examine STD prevalence and risk among sexual minority women.[12,21,22] In the 2002 National Survey of Family Growth (NSFG), 9% of self-identified heterosexual women aged 15–44 reported having ever had genital herpes or genital warts, compared with 2% of lesbians and 17% of bisexual women.[21] Among women who had had sex in the past 12 months, 10% of those who had had only male partners reported having ever had genital herpes or genital warts, compared with 7% of those who had had only female partners and 15% of those who had had both.[21]

An analysis of data from National Health and Nutrition Examination Surveys conducted from 2001 to 2006 found that among sexually experienced women aged 18–59, the proportion who tested positive for herpes simplex virus type 2 was lower among those who had had sex only with men (24%) than among those who had had one or more female partners either during the past year (30%) or during their lifetime (36%).[12] Additionally, compared with other women, those who had ever had sex with another woman had had more partners (both in the past year and in their lifetime) and were more likely to have had sex before age 14 and to have ever used cocaine.[12]

Data from Wave 3 (2001–2002) of the National Longitudinal Study of Adolescent Health (Add Health) indicated that women aged 18–26 who identified themselves as bisexual and those who were romantically attracted to both sexes were more likely than heterosexuals and those attracted only to men, respectively, to have or to recently have had a bacterial STD (gonorrhea, chlamydia or trichomoniasis).[22] Among women with a bacterial STD, those who identified themselves as homosexual or had had only same-sex partners were especially likely to consider themselves to be at very low risk for STDs.[22]

Women who have sex with women vary in their sexual identity, sexual attraction and sexual behavior. Frequently, a woman's sexual identity (her self-described sexual orientation) does not align with her sexual behavior, as measured by the gender of her partners.[23–26] For example, in the 2002 NSFG, more than half of women who had had both male and female partners in the past 12 months, and 11% of those who had had only female partners, considered themselves heterosexual.[21] In the National Health and Nutrition Examination Surveys, 53% of women who had ever had sex with another woman self-identified as heterosexual or straight; 28% considered themselves bisexual, and 19% homosexual or lesbian.[12] However, younger women (those aged 18–29) were more likely than older women (those aged 50–59) to report a sexual identity that aligned with their same-sex or bisexual behaviors.[12]

No studies, to our knowledge, have explored STD risk exclusively among young adult females, or have done so using a spectrum of sexual identity that includes categories for women who consider themselves "mostly heterosexual/straight" or "mostly gay/lesbian." The purpose of our investigation was to examine, using a nationally representative sample of young adult women, the association between sexual orientation—as measured both by self-reported sexual identity and by gender of sex partners—and recent STD diagnosis. We hypothesized that young adult women who identified themselves as bisexual or "mostly straight," as well as those who had ever had a female sex partner, would be more likely than straight women or those who had had only male partners to report an STD.

METHODS
Sample
We analyzed Wave 4 (2007–2008) data from Add Health, which has prospectively followed a nationally representative sample of individuals who were enrolled in grades 7–12 in 1994–1995.[27] At Wave 4, conducted when respondents were aged 24–32, the sample included 8,350 women. We excluded those who had not been assigned a probability weight (482 women), had never had sex (238) or did not report a sexual identity (35). We further excluded 299 respondents who had not provided information on other variables used in our models (including 129 who were missing information on the gender of their sex partners), yielding an analytic sample of 7,296 respondents.* Black and Hispanic women were more likely than white women, and straight women were more likely than mostly straight women, to be excluded from the sample.

Measures
•*STDs.* We categorized respondents as having had an STD if, in the past 12 months, they had been told by a doctor, nurse or other health professional that they had any of 13 specified STDs or another STD.†

•*Sexual orientation and behavior.* We assessed sexual orientation using measures of women's sexual identity and their sex partners' gender. Respondents reported their sexual identity as straight, mostly straight, bisexual, mostly gay or gay. We combined mostly gay and gay women into a single category, because the two groups had similar risk and behavioral profiles, and because the number of women in each group was relatively small. Respondents also reported the gender of their sex partners during their lifetime; using this information, we categorized women as having had only male partners, having had one female partner or having had two or more female partners. We did not create a category for women who had had only female partners; the sample included just 26 such women (only some of whom had had an STD in the past 12 months), so the resulting risk estimates would have been highly unstable.

To examine the extent to which differences in sexual behaviors explain the association between sexual orientation and STD diagnosis, we included in our models a

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*We did not exclude women who were missing data on household income; instead, we categorized their income as "missing."

†The STDs were cervicitis, chlamydia, genital herpes, genital warts, gonorrhea, hepatitis B, HIV/AIDS, human papillomavirus, pelvic inflammatory disease, syphilis, trichomoniasis, urethritis and vaginitis.

number of indicators of sexual behaviors. These were life-time number of partners (categorized as 1–2, 3–5, 6–9, or 10 or more); whether women had ever had oral sex, ever had vaginal sex (with a male), ever had anal sex (with a male) and ever been physically forced to have sex; and whether they had had concurrent sex partners in the past 12 months.

•*Other indicators.* We included respondents' age as a continuous variable and categorized their race and ethnicity as white, black, Asian or Pacific Islander, Hispanic or other. Socioeconomic measures included were educational attainment (categorized as less than high school diploma, high school diploma or GED, some college or vocational training, or bachelor's degree or higher), employment status (whether the woman worked for pay at least 10 hours a week) and household income ($0–39,999, $40,000–74,999, $75,000 or more, or missing). We categorized respondents' relationship status as married, unmarried and cohabiting, or unmarried and not cohabiting.

A number of dichotomous measures captured general health risk behaviors. We assessed whether respondents had ever used illicit drugs (steroids, marijuana, cocaine, crystal meth or other illegal substances), had ever used prescription drugs illegally (i.e., when the drugs had not been prescribed to them), had frequently engaged in binge drinking (i.e., had had four or more drinks in a row at least 24 times) in the past year, currently smoked (i.e., had smoked one or more cigarettes in the past 30 days) and had had their last routine doctor checkup within the past two years.

Analytic Approach

We began by calculating descriptive statistics. Next, we examined bivariate associations of our sexual orientation measures with STD diagnosis and covariates using chi-square tests. We then used multivariate logistic regression to examine the relationships of sexual identity and gender of partners with STD diagnosis in the past 12 months. We calculated four models. The first controlled for age and for race and ethnicity; the second also adjusted for social and demographic characteristics; the third added measures of sexual behavior; and the final model included measures of nonsexual health risk behaviors. All analyses were weighted using the *svy* command in Stata 11 to adjust for Add Health's sampling design and for respondent attrition.

RESULTS
Sample Characteristics

In general, respondents were white (69%), had attended college or received vocational training (79%) and worked at least 10 hours a week for pay (78%); about half (49%) were married (Table 1). Their mean age was 28.7 (not shown), and a third lived in households with an income of $40,000–74,999. Most women identified themselves as straight (80%) or mostly straight (16%); 4% considered themselves bisexual, mostly gay or gay. While 85% had

had only male sex partners, 7% had had one female partner and 8% had had more than one.

The vast majority of respondents had engaged in vaginal and oral sex (98% and 95%, respectively), and nearly half (45%) had had anal sex. Thirty-five percent had had 10 or more partners in their lifetime, and 10% had had concurrent partners in the past year; 15% had ever been forced to have sex. Thirteen percent of women had received an STD diagnosis in the past 12 months. Some 55% of respondents had used illicit drugs, and 16% had taken prescription drugs not prescribed to them. Forty-five percent reported frequent binge drinking in the past year, 36% were smokers and 84% had had a routine checkup in the past two years.

Bivariate Associations

Not surprisingly, sexual identity and sexual behavior were closely related. For example, 95% of straight women and 59% of mostly straight women reported having had only male sex partners during their lifetime, whereas 9% of bisexual and 4% of mostly gay or gay women had had only male partners. Twenty percent of mostly straight women had had one female sex partner, and another 20% had had two or more; 67% of bisexual and 88% of mostly gay or gay women had had two or more female partners.

The prevalence of most other characteristics, outcomes and behaviors also differed according to women's sexual identity. Two-thirds of mostly straight and bisexual women had ever had anal intercourse, whereas no more than four in 10 straight women and mostly gay or gay women had ever had anal intercourse. The proportion of respondents who reported having had 10 or more sex partners in their lifetime ranged from 29% among straight women to 68% among bisexual women. Fewer than one in 10 straight women had had concurrent sex partners in the past year, whereas one-fifth or more of sexual minority women had had such partners. Thirteen percent of straight women and 21–31% of sexual minority women reported having ever been forced to have sex. An STD diagnosis in the past year was reported by 18–19% of mostly straight and bisexual women, 12% of straight women and 7% of mostly gay or gay women.

The proportion of respondents who had used illicit drugs or illegally used prescription drugs, frequently engaged in binge drinking or smoked was generally higher among sexual minority women than among straight women. Sexual identity was also associated with having had a routine doctor checkup in the past two years; 65–75% of bisexual and mostly gay/gay women, and 82–85% of straight and mostly straight women, had had such a checkup.

For most measures, prevalence also differed according to the gender of women's partners. Notably, 18–19% of women who had had one or more female sex partners reported having had an STD diagnosis in the past year; 12% of women who had had only male partners had an STD. More than nine in 10 women who had had one or more female partners had also had vaginal sex with a man,

TABLE 1. Percentage of women aged 25–34 with selected characteristics, according to sexual identity and partners' gender, Wave 4, National Longitudinal Study of Adolescent Health, 2007–2008

Characteristic	All	Sexual identity				Gender of partners		
	(N=7,296)	Straight (N=5,832)	Mostly straight (1,157)	Bisexual (N=173)	Mostly gay/gay (N=134)	Males only (N=6,261)	1 female (N=461)	≥2 females (N=574)
Race/ethnicity†,‡								
White	69	68	76	67	65	68	74	69
Black	15	17	9	17	19	16	11	14
Hispanic	11	12	11	12	14	11	10	13
Asian/Pacific Islander	3	3	3	2	1	3	3	2
Other	1	1	2	3	2	1	2	3
Educational attainment†,‡								
<high school	6	6	5	17	9	6	9	9
High school diploma/GED	15	15	14	18	22	15	15	20
Some college/vocational training	45	44	50	48	45	44	51	50
≥bachelor's degree	34	36	32	18	24	36	25	21
Works ≥10 hours/week†,‡	78	78	77	67	82	79	74	73
Relationship status†,‡								
Married	49	52	43	30	14	52	40	31
Cohabiting	20	18	27	39	37	19	24	34
Not cohabiting	31	30	31	31	50			
Income†,‡								
<$40,000	33	32	33	54	41	32	37	42
$40,000–74,999	34	34	36	26	30	34	35	27
≥$75,000	27	28	26	10	24	28	23	23
Missing	6	6	4	10	6	6	5	8
Sexual identity‡								
Straight	80	na	na	na	na	88	42	17
Mostly straight	16	na	na	na	na	11	48	42
Bisexual	2	na	na	na	na	0	9	21
Mostly gay/gay	2	na	na	na	na	0	2	20
Gender of partners†								
Males only	85	95	59	9	4	na	na	na
1 female	7	4	20	24	8	na	na	na
≥2 females	8	2	20	67	88	na	na	na
Ever had vaginal sex†,‡	98	98	99	93	73	98	97	93
Ever had oral sex‡	95	94	99	97	95	94	99	98
Ever had anal sex†,‡	45	40	69	67	34	41	67	66
Lifetime no. of partners†,‡								
1–2	19	21	10	5	6	21	7	<1
3–5	26	29	15	11	17	29	14	7
6–9	21	21	19	16	30	21	24	16
≥10	35	29	56	68	47	29	55	77
Had concurrent partners in past year†,‡	10	8	20	33	18	8	20	29
Ever forced to have sex†,‡	15	13	21	31	21	13	21	32
STD diagnosis in past year†,‡	13	12	18	19	7	12	18	19
Ever used illicit drugs†,‡	55	49	78	75	78	51	78	80
Ever illegally used prescription drugs†,‡	16	12	33	28	25	13	30	36
Frequent binge drinker†,‡	45	41	60	58	63	42	56	60
Current smoker†,‡	36	32	46	53	56	32	55	53
Had checkup in past 2 years†,‡	84	85	82	65	75	85	82	75

†Distributions by sexual identity differ at p<.05. ‡Distributions by gender of sex partners differ at p<.05. *Notes:* Percentages may not total 100 because of rounding. All percentages are weighted. na=not applicable.

TABLE 2. Odds ratios (and 95% confidence intervals) from weighted logistic regression analyses examining associations between women's characteristics and STD diagnosis in the past 12 months

Characteristic	Model 1	Model 2	Model 3	Model 4
Sexual identity				
Straight (ref)	1.0	1.0	1.0	1.0
Mostly straight	1.4 (1.1–1.8)*	1.4 (1.1–1.7)*	1.1 (0.9–1.4)	1.1 (0.8–1.4)
Bisexual	1.1 (0.6–1.9)	1.0 (0.6–1.8)	1.0 (0.6–1.7)	1.0 (0.6–1.8)
Mostly gay/gay	0.4 (0.1–0.9)*	0.3 (0.1–0.8)*	0.4 (0.2–1.1)	0.4 (0.2–1.1)
Gender of partners				
Males only (ref)	1.0	1.0	1.0	1.0
1 female	1.4 (1.0–2.1)	1.3 (0.9–2.0)	1.1 (0.7–1.6)	1.0 (0.7–1.5)
≥2 females	1.7 (1.2–2.4)*	1.6 (1.1–2.3)*	1.1 (0.7–1.6)	1.0 (0.7–1.6)
Age	0.9 (0.9–1.0)*	0.9 (0.9–1.0)	0.9 (0.9–1.0)*	0.9 (0.9–1.0)*
Race/ethnicity				
White (ref)	1.0	1.0	1.0	1.0
Black	1.6 (1.3–1.9)*	1.2 (1.0–1.6)	1.3 (1.0–1.7)*	1.4 (1.0–1.8)*
Hispanic	1.2 (0.8–1.6)	1.1 (0.8–1.5)	1.2 (0.9–1.7)	1.2 (0.9–1.7)
Asian/Pacific Islander	0.6 (0.3–1.2)	0.6 (0.3–1.2)	0.7 (0.3–1.4)	0.7 (0.4–1.4)
Other	0.9 (0.5–1.9)	0.8 (0.4–1.6)	0.8 (0.4–1.6)	0.8 (0.4–1.6)
Education				
<high school	na	1.3 (0.9–1.8)	1.2 (0.8–1.7)	1.2 (0.8–1.8)
High school graduate/GED (ref)	na	1.0	1.0	1.0
Some college/vocational training	na	0.9 (0.7–1.1)	0.8 (0.6–1.0)	0.8 (0.6–1.0)*
≥bachelor's degree	na	0.8 (0.6–1.1)	0.8 (0.6–1.1)	0.8 (0.6–1.1)
Does not work ≥10 hours/week	na	0.9 (0.7–1.1)	0.9 (0.7–1.1)	0.9 (0.7–1.1)
Relationship status				
Married (ref)	na	1.0	1.0	1.0
Cohabiting	na	1.8 (1.4–2.4)*	1.5 (1.2–2.0)*	1.5 (1.2–1.9)*
Not cohabiting	na	2.3 (1.8–2.9)*	1.9 (1.5–2.4)*	1.9 (1.5–2.4)*
Income				
<$40,000 (ref)	na	1.0	1.0	1.0
$40,000–74,999	na	1.0 (0.7–1.3)	1.0 (0.8–1.3)	1.0 (0.8–1.3)
≥$75,000	na	0.9 (0.7–1.2)	1.0 (0.8–1.2)	1.0 (0.8–1.2)
Missing	na	0.9 (0.6–1.3)	0.9 (0.6–1.4)	0.9 (0.6–1.4)
Never had vaginal sex	na	na	0.3 (0.1–1.0)	0.4 (0.1–1.0)
Never had oral sex	na	na	0.9 (0.5–1.5)	0.9 (0.5–1.5)
Never had anal sex	na	na	0.7 (0.5–0.9)*	0.7 (0.5–0.9)*
Lifetime no. of partners				
1–2	na	na	0.2 (0.1–0.4)*	0.3 (0.2–0.4)*
3–5	na	na	0.6 (0.5–0.8)*	0.6 (0.5–0.8)*
6–9	na	na	0.9 (0.6–1.2)	0.9 (0.6–1.3)
≥10 (ref)	na	na	1.0	1.0
No concurrent partners in past year	na	na	0.8 (0.6–1.1)	0.8 (0.6–1.1)
Never forced to have sex	na	na	0.9 (0.7–1.2)	0.9 (0.7–1.2)
Never used illicit drugs	na	na	na	0.9 (0.7–1.1)
Never illegally used prescription drugs	na	na	na	0.7 (0.5–1.0)
Not a frequent binge drinker	na	na	na	1.0 (0.8–1.3)
Nonsmoker	na	na	na	1.1 (0.9–1.3)
Had checkup in past 2 years	na	na	na	1.2 (0.9–1.6)

*p<.05. *Notes:* All measures without a reference group are dichotomous except for age, which is continuous. ref=reference group. na=not applicable.

and two-thirds had had anal sex. Seventy-seven percent of women who had had two or more female partners reported having had 10 or more partners, as did 55% of women with only one female partner and 29% of those with only male partners. Thirty-two percent of women who had had two or more female partners, 21% of those who had had only one female partner and 13% of those who had had only male partners had ever been forced to have sex.

Multivariate Associations

In our model that controlled only for age and for race and ethnicity, the odds of having had an STD diagnosis in the past 12 months were higher among women who identified themselves as mostly straight, and lower among women who considered themselves mostly gay or gay, than among women who said they were straight (odds ratios, 1.4 and 0.4, respectively—Table 2). Women who had had two or more female sex partners were more likely to have had an STD diagnosis than were women who had had only male partners (1.7); the odds of a diagnosis did not differ, however, between women who had had only one female partner and those who had had sex only with men. Additionally, the odds of a diagnosis declined with age (0.9 per year) and were higher among black women than among whites (1.6).

After adjustment for social and demographic characteristics (model 2), the odds of an STD diagnosis remained higher among mostly straight women, and lower among mostly gay or gay women, than among straight women (odds ratios, 1.4 and 0.3, respectively). Moreover, the odds remained elevated among women who had had two or more female sex partners (1.6). Of the social and demographic covariates, only relationship status was significant; compared with married women, cohabiting and noncohabiting single women had higher odds of reporting an STD (1.8 and 2.3, respectively).

With further adjustment for sexual risk behaviors, sexual identity and gender of sex partners were no longer associated with receipt of an STD diagnosis (model 3). However, women who had not engaged in anal sex had reduced odds of an STD diagnosis (odds ratio, 0.7), and women who had had 1–5 sex partners were less likely than those who had had 10 or more to report an STD diagnosis (0.2–0.6). The lack of an association between sexual orientation and STD diagnosis was also apparent in the final model, which controlled for engagement in other health risk behaviors (model 4). Moreover, none of the health risk behaviors included in model 4 was associated with STD diagnosis, although the associations with age, race and ethnicity, relationship status, anal sex and number of partners remained.

DISCUSSION

Consistent with previous studies that used nationally representative samples,[11,12,21,22] we found that substantial proportions of young adult women identified themselves as sexual minorities and had had female sex partners. Moreover, by using a measure of sexual identity that was more nuanced than the traditional heterosexual/bisexual/homosexual classification, we found that nearly four times as many young adult women identified themselves as mostly straight as considered themselves bisexual, mostly gay or gay combined, and that four in 10 mostly straight women had had one or more female partners. Because many young women use the terms "mostly straight" or "bi-curious" to signify that they are open to the possibility of same-sex contact (even though they consider their basic orientation to be heterosexual),[28–30] STD and sexual health researchers should consider including "mostly straight" as a separate category when measuring sexual identity.

Although STD risk was elevated among mostly straight women and reduced among gay and mostly gay women, even with adjustment for demographic characteristics and socioeconomic status, these associations were eliminated in models that controlled for sexual behaviors. STD risk was elevated among women who had had anal intercourse with a male partner or had had 10 or more partners; given that substantial proportions of women in certain sexual minority populations had engaged in these behaviors, it should not be surprising that STD risk varied according to women's sexual orientation (in models that did not adjust for sexual behaviors).

These results are consistent with findings from previous research showing that compared with women who identified themselves as heterosexual and had had only male partners, bisexual women and those who considered themselves heterosexual but had had female sex partners were more likely to have had anal intercourse with a male and had had more partners.[6,11,12,31,32] Thus, having both male and female sex partners may serve as a marker for STD risk behaviors among young adult women. Moreover, research exploring why certain populations of sexual minority women engage in sexual risk behaviors more frequently than other women is warranted. Particular attention should be given to how sexual identity exploration, sensation-seeking, perception of STD risk and experiences with forced sex are associated with sexual risk-taking among diverse groups of sexual minority women, as these characteristics have been associated with an elevated risk of STDs (including HIV) among men, male and female adolescents and other populations of young women.[33–38] Such information is vital to the development of STD interventions that target young adult women who are at greatest risk.

Given that anal intercourse with a male was associated with STDs in this investigation, we recommend that sexual and reproductive health care providers screen young adult women for a history of this behavior and, when such a history is noted, conduct a rectal screening for STDs. Adding such screening to the usual urine-based screening would be particularly valuable, as urine-based screening alone misses a significant proportion of chlamydia and gonorrhea infections in women.[39] In addition, providers should discuss STDs with their female patients and ensure that they are taking precautions to prevent STD transmission with both male and female partners. Most important, providers should not make assumptions about women's sexual behavior or STD risk solely on the basis of their sexual identity.

Because many STDs are asymptomatic, some women in this study, particularly sexual minority women, likely had an undiagnosed infection. We found that women who were gay, mostly gay or bisexual, and women who had had two or more female partners, were less likely to have had a routine checkup in the past two years than were women who

Providers should not make assumptions about women's...STD risk solely on the basis of their sexual identity.

were straight or had had only male partners. This is not surprising, given that lesbian and bisexual women are less likely than heterosexual women to seek cervical and breast cancer screening and often delay obtaining general health care because of negative experiences with providers.[40–44] To address these disparities, additional research is needed that explores health care providers' attitudes toward and knowledge regarding the sexual and reproductive health care needs of sexual minority women.

Another reason that many participants likely had undiagnosed STDs is that self-reports do not capture all cases; biological tests were not used in this study, but would have provided a more reliable measure of STD prevalence.[45] Thus, it is vital that all women, regardless of sexual identity, understand that STDs may be asymptomatic and that women be made aware of their STD risk and of the importance of seeking regular sexual or gynecologic health care.

Our results highlight the importance of health care providers' considering young women's sexual identity and sexual behaviors, as well as the gender of their partners, when taking sexual histories and assessing STD risk. The fact that so few young adult women had had only female partners underscores the limited usefulness of the "heterosexual contact" category in surveillance of STDs among women. As it is for men who have sex with men, it is important that surveillance efforts consider not only women's sexual identity but also the specific sexual behaviors in which they engage with male (and female) partners that place them at risk for an STD.[46] Behaviors such as anal sex and vaginal sex with a male should be considered as replacements for "heterosexual contact," particularly since sexual minority women often do not perceive themselves to be at risk for—and in some instances feel invulnerable to—infection.[22,38,47,48]

Limitations

Our sample consisted of young women who had been in grades 7–12 in 1994–1995; as such, our findings may not apply to other populations. To our knowledge, however, our study is the first to use a nationally representative sample to examine STD diagnoses in the past year by sexual orientation among young adult women. Our measures of illicit drug use and illegal prescription drug use were restricted to ever-use; STD risk may be associated with recent substance use or frequency of use, but no appropriate measures were included in Wave 4 of Add Health. Finally, condom use at last vaginal or anal intercourse was not included in the analyses, as not all women had engaged in these sexual behaviors or had done so with male partners. Condom use likely would have reduced the odds of an STD among women who had mostly or exclusively had male sex partners.

Conclusion

For too long, sexual minority women have remained invisible to STD surveillance and prevention efforts in the United States. Findings from this and other investigations of nationally representative samples have consistently demonstrated that some subpopulations of sexual minority women are at greater risk for STDs than are heterosexual women or women who have sex only with men. The time has come to redirect our efforts and to focus on the sexual health concerns of all women, not just of heterosexual women, and to expand our understanding of women's sexuality and sexual behavior. The goal of such efforts should be not to simply identify subpopulations of women at elevated risk, but rather to understand the experiences and motivations that shape women's sexual decisions. Such information is crucial in order to prevent STDs and promote the sexual health of all women.

REFERENCES

1. Centers for Disease Control and Prevention (CDC), *Sexually Transmitted Disease Surveillance 2010*, Atlanta: Department of Health and Human Services (DHHS), 2011.

2. U.S. Census Bureau, Estimated median age at first marriage, by sex: 1890–present, 2011, <http://www.census.gov/population/socdemo/hh-fam/ms2.xls>, accessed Dec. 22, 2011.

3. Mathews TJ and Hamilton BE, Delayed childbearing: More women are having their first child later in life, *NCHS Data Brief,* Hyattsville, MD: National Center for Health Statistics, 2009, No. 21.

4. CDC, *Consultation to Address STD Disparities in African American Communities: Meeting Report, Atlanta, GA, June 5–6, 2007,* Atlanta: DHHS, 2007, <http://www.cdc.gov/std/general/STDHealthDisparities ConsultationJune2007.pdf>, accessed Dec. 22, 2011.

5. Koh AS et al., Sexual risk factors among self-identified lesbians, bisexual women, and heterosexual women accessing primary care settings, *Sexually Transmitted Diseases,* 2005, 32(9):563–569.

6. Lindley LL et al., STDs among sexually active female college students: Does sexual orientation make a difference? *Perspectives on Sexual and Reproductive Health,* 2008, 40(4):212–217.

7. CDC, HIV/AIDS among women who have sex with women, *CDC HIV/AIDS Fact Sheet,* 2006, <http://www.cdc.gov/hiv/topics/women/resources/factsheets/wsw.htm>, accessed Dec. 22, 2011.

8. Marrazzo JM, Barriers to infectious disease care among lesbians, *Emerging Infectious Diseases,* 2004, 10(11):1974–1978.

9. CDC, *Sexually Transmitted Disease Surveillance 2011*, Atlanta: DHHS, 2012, p. 79.

10. Lansky A et al., A method for classification of HIV exposure category for women without HIV risk information, *Morbidity and Mortality Weekly Report,* 2001, Vol. 50, No. RR-6.

11. Chandra A et al., Sexual behavior, sexual attraction, and sexual identity in the United States: data from the 2006–2008 National Survey of Family Growth, *National Health Statistics Reports,* 2011, No. 36.

12. Xu F, Sternberg MR and Markowitz LE, Women who have sex with women in the United States: prevalence, sexual behavior and prevalence of herpes simplex virus type 2 infection—results from National Health and Nutrition Examination Survey 2001–2006, *Sexually Transmitted Diseases,* 2010, 37(7):407–413.

13. CDC, Sexually transmitted diseases treatment guidelines, 2010, *Morbidity and Mortality Weekly Report,* 2010, Vol. 59, No. RR-12.

14. Fethers K et al., Sexually transmitted infections and risk behaviours in women who have sex with women, *Sexually Transmitted Infections,* 2000, 76(5):345–349.

15. Marrazzo JM et al., Characterization of vaginal flora and bacterial vaginosis in women who have sex with women, *Journal of Infectious Diseases,* 2002, 185(9):1307–1313.

16. Kellock D and O'Mahony CP, Sexually acquired metronidazole-resistant trichomoniasis in a lesbian couple, *Genitourinary Medicine,* 1996, 72(1):60–61.

17. Kwakwa HA and Ghobrial MW, Female-to-female transmission of human immunodeficiency virus, *Clinical Infectious Diseases,* 2003, 36(3):e40–e41.

18. Berger BJ et al., Bacterial vaginosis in lesbians: a sexually transmitted disease, *Clinical Infectious Diseases,* 1995, 21(6):1402–1405.

19. Singh D, Fine DN and Marrazzo JM, *Chlamydia trachomatis* infection among women reporting sexual activity with women screened in family planning clinics in the Pacific Northwest, 1997 to 2005, *American Journal of Public Health,* 2011, 101(7):1284–1290.

20. Marrazzo JM et al., Papanicolaou test screening and prevalence of genital human papillomavirus among women who have sex with women, *American Journal of Public Health,* 2001, 91(6):947–952.

21. Tao G, Sexual orientation and related viral sexually transmitted disease rates among US women aged 15–44 years, *American Journal of Public Health,* 2008, 98(6):1007–1009.

22. Kaestle CE and Waller MW, Bacterial STDs and perceived risk among sexual minority young adults, *Perspectives on Sexual and Reproductive Health,* 2011, 43(3):158–163.

23. Badgett L and Goldberg NE, *Best Practices for Asking Questions About Sexual Orientation on Surveys,* Los Angeles: Williams Institute, 2009.

24. Diamond LM, A new view of lesbian subtypes: stable versus fluid identity trajectories over an 8-year period, *Psychology of Women Quarterly,* 2005, 29(2):119–128.

25. Baumeister RF, Gender differences in erotic plasticity: the female sex drive as socially flexible and responsive, *Psychological Bulletin,* 2000, 126(3):347–374.

26. Kitzinger C and Wilkinson S, Transitions from heterosexuality to lesbianism: the discursive production of lesbian identities, *Developmental Psychology,* 1995, 31(1):95–104.

27. Harris KM et al., The National Longitudinal Study of Adolescent Health: research design, 2009, <http://www.cpc.unc.edu/projects/addhealth/design>, accessed July 27, 2009.

28. Diamond LM, The desire disorder in research on sexual orientation in women: contributions of dynamical systems theory, *Archives of Sexual Behavior,* 2012, 41(1):73–83.

29. Morgan EM and Thompson EM, Young women's sexual experiences within same-sex friendships: discovering and defining bisexual and bi-curious identity, *Journal of Bisexuality,* 2006, 6(3):7–34.

30. Thompson EM and Morgan EM, "Mostly straight" young women: variations in sexual behavior and identity development, *Developmental Psychology,* 2008, 44(1):15–21.

31. Bauer GR and Welles SL, Beyond assumptions of negligible risk: sexually transmitted diseases and women who have sex with women, *American Journal of Public Health,* 2001, 91(8):1282–1286.

32. Gonzales V et al., Sexual and drug-use risk factors for HIV and STDs: a comparison of women with and without bisexual experiences, *American Journal of Public Health,* 1999, 89(12):1841–1846.

33. Doll LS and Beeker C, Male bisexual behavior and HIV risk in the United States: synthesis of research with implications for behavioral interventions, *AIDS Education and Prevention,* 1996, 8(3):205–225.

34. Henderson VR et al., When risky is attractive: sensation seeking and romantic partner selection, *Personality and Individual Differences,* 2005, 38(2):311–325.

35. Teva I, Bermudez MP and Bula-Casal G, Sexual sensation seeking, social stress, and coping styles as predictors of HIV/STD risk behaviors in adolescents, *Youth & Society,* 2010, 42(2):255–277.

36. Kalichman SC et al., Sensation seeking, alcohol use and sexual risk behaviors among men receiving services at a clinic for sexually transmitted infections, *Journal of Studies on Alcohol,* 2003, 64(4):564–569.

37. Spitalnick JS et al., Brief report: sexual sensation seeking and its relationship to risky sexual behaviour among African-American adolescent females, *Journal of Adolescence,* 2007, 30(1):165–173.

38. Marrazzo JM, Coffey P and Bingham A, Sexual practices, risk perception and knowledge of sexually transmitted disease risk among lesbian and bisexual women, *Perspectives on Sexual and Reproductive Health,* 2005, 37(1):6–12.

39. Hunte T, Alcaide M and Castro J, Rectal infections with chlamydia and gonorrhoea in women attending a multiethnic sexually transmitted diseases urban clinic, *International Journal of STD & AIDS,* 2010, 21(12):819–822.

40. Stevens PE and Hall JM, Stigma, health beliefs and experiences with health care in lesbian women, *Journal of Nursing Scholarship,* 1988, 20(2):69–73.

41. Stevens PE, Lesbian health care research: a review of the literature from 1970–1990, *Health Care for Women International,* 1992, 13(2):91–120.

42. Trippet SE and Bain J, Reasons American lesbians fail to seek traditional health care, *Health Care for Women International,* 1992, 13(2):145–153.

43. Rankow EJ and Tessaro I, Cervical cancer risk and Papanicolaou screening in a sample of lesbian and bisexual women, *Journal of Family Practice,* 1998, 47(2):139–142.

44. Hart SL and Bowen DJ, Sexual orientation and intentions to obtain breast cancer screening, *Journal of Women's Health,* 2009, 18(2):177–185.

45. Iritani BJ et al., Comparison of self-reported and test-identified chlamydial infections among young adults in the United States of America, *Sexual Health,* 2006, 3(4):245–251.

46. Young RM and Meyer IH, The trouble with "MSM" and "WSW": erasure of the sexual-minority person in public health discourse, *American Journal of Public Health,* 2005, 95(7):1144–1149.

47. Wildsmith E et al., STDs among young adults: prevalence, perceived risk, and risk-taking behaviors, *Child Trends Research Brief,* Washington, DC: Child Trends, 2010.

48. Richardson D, The social construction of immunity: HIV risk perception and prevention among lesbians and bisexual women, *Culture, Health & Sexuality,* 2000, 2(1):33–49.

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