Sexual Orientation Disparities in Papanicolaou Test Use Among US Women: The Role of Sexual and Reproductive Health Services

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We investigated sexual orientation disparities in Papanicolaou screening among US women aged 21 to 44 years (n = 9581) in the 2006 to 2010 National Survey of Family Growth. The odds ratios for lesbian versus heterosexual women and women with no versus only male sexual partners were 0.40 and 0.32, respectively, and were attenuated after adjustment for sexual and reproductive health (SRH) care indicators. Administering Papanicolaou tests through mechanisms other than SRH services would promote cervical cancer screening among all women. (*Am J Public Health.* 2014; 104:e68–e73. doi:10.2105/AJPH.2013.301548)

Cervical cancer, a deadly disease primarily caused by human papillomavirus infection,[1] can be prevented through regular Papanicolaou (Pap) test use and appropriate follow-up.[2,3] Although lesbians and women who have sex with women are at risk for human papillomavirus[4–14] from both past and present sexual partners, limited evidence derived from convenience[15,16] and subnational population-based[16,17] samples suggests that they are less likely than heterosexual women and women with only male sexual partners, respectively, to receive Pap tests.[8,9,15,17–22] We accordingly investigated sexual orientation disparities in Pap test use in a large US national probability sample, which no previous study has done, and assessed the contribution of sexual and reproductive health (SRH) services to sexual orientation disparities in Pap test use.

METHODS

We analyzed data from the 2006 to 2010 National Survey of Family Growth, which provides a nationally representative US sample of 10 403 men and 12 279 women aged 15 to 44 years.[23,24] We restricted our analysis to women aged 21 years and older (n = 9581), in line with the American Congress of Obstetricians and Gynecologists' cervical cancer screening guidelines during the study period.[25]

The outcome was Pap test use in the past 12 months, and the predictors were sexual orientation identity and sex of sexual partners in the past year (shown with their categorization in Table 1). Covariates were social and economic factors and health care indicators, including the use of SRH services (Table 1). We excluded 299 women (3.1%) from multivariable analyses because of missing data.

We used logistic regression to model the relationship between each measure of sexual orientation and Pap test use. After fitting bivariate models, we first added social and economic factors, followed by health care indicators. We tested for possible interactions between sexual orientation and receiving contraception as well as ever having been pregnant; we retained only statistically significant interaction terms ($P < .05$) in the final models. All analyses were weighted for the survey's complex sampling design with Stata 12.[26]

RESULTS

Table 1 presents sample characteristics by sexual orientation. Pap test use was lowest among lesbians (43.3%) and women with no sexual partners in the past year (43.9%). Table 2 shows that after adjustment for social and economic factors (models 2a and 2b), the odds of Pap test use were lower among lesbians than heterosexual women (odds ratio [OR] = 0.40; 95% confidence interval [CI] = 0.23, 0.68) and lower among women with no sexual partners than women with only male sexual partners (OR = 0.32; 95% CI = 0.25, 0.42).

Including health care indicators (models 3a and 3b) attenuated the odds ratios for lesbians relative to heterosexual women (OR = 0.56; 95% CI = 0.28, 1.12) and women with no relative to only male sexual partners (OR = 0.54; 95% CI = 0.43, 0.69). In these fully adjusted models, obtaining contraceptive and sexually transmitted infection services in the past year was positively associated with Pap test use among all women. However, including interaction terms (model 4a) showed that receiving contraception was positively associated with Pap test use among heterosexual (OR = 6.79; 95% CI = 5.46, 8.44) and bisexual (OR = 10.03; 95% CI = 1.51, 66.03) women only; having ever been pregnant was positively associated with Pap test use among heterosexual women only (OR = 1.37; 95% CI = 1.11, 1.70; Table 2). Similarly to contraceptive and sexually transmitted infection services use, the odds of Pap test use did not differ by pregnancy history among women with only male (OR = 1.12; 95% CI = 0.89, 1.41), both male and female (OR = 0.78; 95% CI = 0.10, 5.82), only female (OR = 0.58; 95% CI = 0.07, 4.68), and no (OR = 0.91; 95% CI = 0.31, 2.80) sexual partners in the past year (model 4b).

DISCUSSION

Our findings provide the first national estimates of the relationship between sexual orientation and Pap test use among US women aged 21 to 44 years, derived from cross-sectional, self-report data. They also indicate that observed sexual orientation disparities in Pap test use may be linked to differentials in SRH services use. Indeed, lesbians and women with no sexual partners in the past year were less likely than heterosexual women and women with only male sexual partners, respectively, to have received contraceptive and sexually transmitted infection services and to have ever been pregnant. Because reproductive health represents an important entry point into the health care system for women, lesbians and women with no sexual partners in the past year have fewer opportunities to obtain a Pap test.

One implication of our findings is that health care facilities should also administer Pap tests through mechanisms other than SRH services, such as during routine primary care visits and regular cervical cancer screening clinics for

TABLE 1—Distribution of US Women Aged 21–44 Years by Sexual Orientation Identity and Sex of Sexual Partners in the Past Year by Social, Economic, and Health Care Factors: National Survey of Family Growth, 2006–2010

		Sexual Orientation Identity			Sex of Sexual Partners in the Past Year			
Variable	Total (n = 9581), %	Heterosexual (n = 8838; 92.3%), %	Bisexual (n = 410; 4.3%), %	Lesbian (n = 151; 1.6%), %	Male Only (n = 8129; 84.9%), %	Male and Female (n = 309; 3.2%), %	Female Only (n = 145; 1.5%), %	No Partners (n = 998; 10.4%), %
Pap test in past 12 mo	68.0	68.5	64.5	43.3	70.7	66.7	46.0	43.9
Age, y								
21–29	38.4	37.5	62.2	44.9	37.5	57.4	42.6	41.3
30–44	61.6	62.5	37.8	55.1	62.5	42.6	57.4	58.8
Race/ethnicity								
White	61.3	61.5	73.8	50.8	61.2	71.9	56.2	59.1
Black	13.5	13.4	11.9	21.1	13.2	14.3	19.4	15.4
Latina/Hispanic	16.6	16.5	7.7	16.0	17.1	7.4	12.2	14.5
"Other"/"multiracial"	8.7	8.6	6.7	12.0	8.5	6.5	12.3	11.0
Place of residence								
MSA, central city	32.5	31.8	43.1	52.3	31.7	40.5	56.5	35.5
MSA, other	47.7	48.0	39.9	45.0	48.1	43.0	39.6	45.9
Non-MSA	19.8	20.2	17.0	2.7	20.2	16.5	3.9	18.6
Relationship status								
Married	51.4	52.3	37.3	5.6	57.2	31.2	0.8	4.4
Not married, living with a male partner	12.4	12.2	18.5	1.3	13.6	15.2	1.4	0.6
Separated, divorced, or widowed	11.4	11.4	13.3	10.1	9.7	11.8	19.6	27.9
Never married	24.9	24.0	30.9	82.9	19.5	41.8	78.2	67.1
Language								
English	92.9	93.2	98.6	94.8	92.4	99.5	98.9	95.1
Spanish	7.1	6.8	1.4	5.3	7.6	0.5	1.1	4.9
US-born	83.4	83.7	92.8	80.9	83.5	93.1	88.2	78.8
Educational attainment								
< high school degree	14.8	14.2	21.4	10.3	15.1	17.3	9.7	11.2
High school diploma or GED	24.4	24.2	30.5	28.0	24.6	33.5	22.1	20.0
Some college/associate's degree	30.2	30.2	35.9	27.6	29.7	33.5	28.8	33.8
≥ bachelor's degree	30.7	31.5	12.3	34.1	30.6	15.7	39.3	35.0
Household income, % federal poverty level								
< 100	20.4	19.8	25.9	18.4	20.0	19.9	18.6	24.6
100–199	22.8	22.9	20.8	15.5	22.6	29.4	15.8	24.6
200–299	18.5	18.2	23.4	24.4	18.3	17.3	24.2	19.9
≥ 300	38.4	39.0	29.9	41.6	39.2	33.5	41.4	30.9

Continued

TABLE 1—*Continued*

Employment status									
Working	72.6	72.92	67.8	84.2	72.3	70.7	84.6	75.7	
Not working	23.7	23.43	28.0	14.2	24.3	26.1	13.8	18.3	
Student	3.7	3.65	4.3	1.7	3.5	3.2	1.6	6.1	
Health insurance status									
Private	62.4	63.6	45.4	58.8	63.1	50.8	60.6	59.8	
Public	16.0	15.3	28.1	22.6	15.9	19.6	15.3	15.8	
Uninsured, single-service plan, or Indian Health Service	21.6	21.1	26.5	18.6	21.0	29.6	24.2	24.5	
Received a contraceptive method or prescription for a method in the past y	33.7	34.0	35.7	11.3	35.6	39.5	7.9	16.7	
Received STI counseling, testing, or treatment in the past y	15.9	15.4	28.6	14.3	16.6	32.0	10.6	4.5	
Ever pregnant	74.3	74.7	71.2	33.9	77.6	71.4	28.0	46.2	

Note. GED = general equivalency diploma; MSA = metropolitan statistical area; NSFG = National Survey of Family Growth; Pap = Papanicolau; STI = sexually transmitted infection. Missing data was < 1.0% for Pap test in the last 12 months, language, US nativity, receiving a contraceptive method or prescription for a method in the past year, and receiving STI counseling, testing, or treatment in the past year. Missing data was 1.9% for sexual orientation identity. Sex of sexual partners in the past year had no missing values among women aged 21–44 years. Missing values for age, race/ethnicity, relationship status, place of residence, household income, educational attainment, employment status, and health insurance status were multiply imputed by the NSFG; ever being pregnant was computed by the NSFG and had no missing data. Prevalence estimates were adjusted for the NSFG's complex sampling design and weighted to the US population with Stata 12.[26] Percentages may not add to 100% because of rounding.

underscreened women or through mobile health care vans that provide Pap tests in women's communities. In addition, because some research suggests that lesbians may prefer receiving care from general practitioners rather than obstetrician-gynecologists,[27] it may be beneficial to improve the capacity of general practitioners to provide Pap tests, in light of evidence that they are less likely than obstetrician-gynecologists to provide cervical cancer screening and other SRH services.[28–32] Finally, because human papillomavirus risk is linked to women's past and present male and female sexual partners,[12,33] increasing Pap test use among women who identify as lesbian or currently have no sexual partners will likely require programs—for both women and health care providers—that promote knowledge of human papillomavirus risk across the life course among women of all sexual orientations.[34–37] ■

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Contributors

M. Agénor conceptualized and designed the study, conducted the data analyses, and drafted the article. N. Krieger, as senior author, helped conceptualize and design the study, helped shape the data analyses, and contributed to the writing, reviewing, and editing of the article. S. B. Austin helped design the study, helped shape the data analyses, and contributed to reviewing and editing the article. S. Haneuse helped shape the data analyses, provided statistical advice, and contributed to reviewing the article. B. R. Gottlieb contributed to interpreting the study results and reviewing the article.

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TABLE 2—Results of Multivariable Analysis for the Odds of Receiving a Papanicolau Test in the Past 12 Months Among US Women Aged 21–44 Years by Sexual Orientation Identity and Sex of Sexual Partners in the Past Year by Social, Economic, and Health Care Factors: National Survey of Family Growth, 2006–2010

	Sexual Orientation Identity				Sex of Sexual Partners in the Past Year			
Variable	Model 1a[a] OR (95% CI)	Model 2a[b] OR (95% CI)	Model 3a[c] OR (95% CI)	Model 4a[d] OR (95% CI)	Model 1b[a] OR (95% CI)	Model 2b[b] OR (95% CI)	Model 3b[c] OR (95% CI)	Model 4b[d] OR (95% CI)
Sexual orientation identity								
Heterosexual (Ref)	1.00	1.00	1.00	1.00				
Bisexual	0.84 (0.58, 1.22)	0.85 (0.58, 1.22)	0.81 (0.54, 1.22)	1.78 (0.89, 3.54)				
Lesbian	0.35 (0.21, 0.58)	0.40 (0.23, 0.68)	0.56 (0.28, 1.12)	0.85 (0.45, 1.61)				
Sex of past-y sexual partners								
Male only (Ref)					1.00	1.00	1.00	1.00
Male and female					0.83 (0.57, 1.20)	0.84 (0.58, 1.22)	0.77 (0.49, 1.22)	1.01 (0.44, 2.32)
Female only					0.35 (0.22, 0.57)	0.32 (0.19, 0.54)	0.62 (0.35, 1.09)	0.62 (0.34, 1.14)
No partners					0.32 (0.26, 0.41)	0.32 (0.25, 0.42)	0.54 (0.43, 0.69)	0.36 (0.25, 0.53)
Social and economic factors								
Age, y								
21–29 (Ref)		1.00	1.00	1.00		1.00	1.00	1.00
30–39		0.75 (0.63, 0.88)	1.11 (0.92, 1.35)	1.10 (0.91, 1.34)		0.79 (0.67, 0.93)	1.14 (0.94, 1.39)	1.14 (0.93, 1.38)
Race/ethnicity								
White (Ref)		1.00	1.00	1.00		1.00	1.00	1.00
Black		1.57 (1.25, 1.97)	1.66 (1.28, 2.14)	1.65 (1.28, 2.13)		1.48 (1.19, 1.83)	1.60 (1.25, 2.05)	1.58 (1.23, 2.02)
Latina/Hispanic		0.98 (0.77, 1.25)	1.05 (0.79, 1.39)	1.05 (0.79, 1.40)		0.94 (0.74, 1.19)	1.01 (0.77, 1.33)	1.01 (0.77, 1.33)
"Other"/"multiracial"		0.84 (0.61, 1.14)	1.03 (0.75, 1.40)	1.02 (0.75, 1.40)		0.80 (0.59, 1.10)	0.98 (0.72, 1.32)	0.98 (0.72, 1.33)
Place of residence								
MSA, central city (Ref)		1.00	1.00	1.00		1.00	1.00	1.00
MSA, other		0.85 (0.71, 1.02)	0.85 (0.72, 1.01)	0.85 (0.72, 1.01)		0.85 (0.72, 1.01)	0.85 (0.71, 1.00)	0.85 (0.72, 1.00)
Non-MSA		0.98 (0.79, 1.23)	1.13 (0.89, 1.45)	1.14 (0.89, 1.45)		1.01 (0.82, 1.24)	1.16 (0.92, 1.47)	1.16 (0.92, 1.46)
Relationship status								
Married (Ref)		1.00	1.00	1.00		1.00	1.00	1.00
Not married, living with a male partner		1.29 (1.02, 1.63)	1.09 (0.81, 1.46)	1.09 (0.81, 1.46)		1.33 (1.05, 1.67)	1.09 (0.82, 1.45)	1.09 (0.82, 1.45)
Separated, divorced, or widowed		0.89 (0.69, 1.13)	0.84 (0.65, 1.10)	0.85 (0.65, 1.11)		1.13 (0.87, 1.46)	0.95 (0.73, 1.25)	0.90 (0.69, 1.18)
Never married		0.67 (0.55, 0.80)	0.63 (0.52, 0.75)	0.63 (0.52, 0.76)		0.89 (0.75, 1.06)	0.72 (0.60, 0.88)	0.74 (0.61, 0.90)
Language								
English (Ref)		1.00	1.00	1.00		1.00	1.00	1.00
Spanish		1.20 (0.85, 1.71)	1.55 (1.04, 2.33)	1.56 (1.04, 2.34)		1.12 (0.78, 1.62)	1.50 (1.00, 2.23)	1.49 (1.00, 2.21)
Nativity								
US-born (Ref)		1.00	1.00	1.00		1.00	1.00	1.00
Not US-born		0.71 (0.55, 0.92)	0.77 (0.59, 1.00)	0.77 (0.59, 1.00)		0.80 (0.63, 1.01)	0.83 (0.65, 1.06)	0.83 (0.65, 1.07)
Educational attainment								
< high school diploma		0.64 (0.49, 0.83)	0.71 (0.52, 0.95)	0.71 (0.53, 0.95)		0.61 (0.47, 0.79)	0.71 (0.53, 0.95)	0.71 (0.53, 0.95)
High school diploma or GED		0.70 (0.57, 0.86)	0.81 (0.65, 1.01)	0.82 (0.66, 1.01)		0.66 (0.54, 0.82)	0.81 (0.65, 1.00)	0.80 (0.64, 0.99)
Some college/associate's degree		0.88 (0.73, 1.07)	0.96 (0.77, 1.18)	0.95 (0.77, 1.18)		0.85 (0.70, 1.03)	0.95 (0.77, 1.16)	0.94 (0.76, 1.57)
≥ bachelor's degree (Ref)		1.00	1.00	1.00		1.00	1.00	1.00

Continued

TABLE 2—*Continued*

Household income, % federal poverty level						
< 100	0.71 (0.58, 0.88)	0.72 (0.58, 0.90)	0.72 (0.58, 0.89)	0.72 (0.58, 0.88)	0.74 (0.59, 0.92)	0.74 (0.59, 0.92)
100–199	0.59 (0.48, 0.74)	0.63 (0.50, 0.80)	0.62 (0.49, 0.79)	0.61 (0.49, 0.76)	0.66 (0.51, 0.84)	0.66 (0.51, 0.84)
200–299	0.72 (0.59, 0.87)	0.73 (0.59, 0.92)	0.73 (0.58, 0.91)	0.75 (0.61, 0.91)	0.76 (0.60, 0.95)	0.76 (0.60, 0.95)
≥ 300 (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Employment status						
Working (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Not working	0.76 (0.66, 0.87)	0.85 (0.72, 1.00)	0.85 (0.72, 1.00)	0.75 (0.65, 0.87)	0.84 (0.71, 0.99)	0.84 (0.72, 1.00)
Student	0.99 (0.68, 1.45)	1.03 (0.71, 1.49)	1.04 (0.71, 1.50)	1.01 (0.72, 1.42)	1.07 (0.74, 1.54)	1.10 (0.76, 1.57)
Health care indicators						
Health insurance status						
Private (Ref)		1.00	1.00		1.00	1.00
Public		1.03 (0.81, 1.32)	1.03 (0.81, 1.31)		1.03 (0.81, 1.31)	1.02 (0.80, 1.30)
Uninsured, single-service plan, or Indian Health Service		0.43 (0.35, 0.53)	0.43 (0.35, 0.52)		0.42 (0.35, 0.51)	0.42 (0.34, 0.51)
Received a contraceptive method or prescription for a method in the past y						
Yes		6.60 (5.37, 8.12)	6.79 (5.46, 8.44)		6.34 (5.16, 7.78)	6.22 (5.06, 7.63)
No (Ref)		1.00	1.00		1.00	1.00
Received STI counseling, testing, or treatment in the past y						
Yes		4.69 (3.50, 6.29)	4.68 (3.49, 6.24)		4.33 (3.25, 5.75)	4.28 (3.22, 5.69)
No (Ref)		1.00	1.00		1.00	1.00
Ever pregnant						
Yes		1.29 (1.04, 1.60)	1.37 (1.11, 1.70)		1.23 (1.00, 1.51)	1.12 (0.89, 1.41)
No (Ref)		1.00	1.00		1.00	1.00
Interaction terms						
Sexual orientation identity × contraception						
Bisexual × contraception			0.83 (0.31, 2.21)			
Lesbian × contraception			0.15 (0.03, 0.77)			
Sexual orientation identity × ever pregnant						
Bisexual × ever pregnant			0.37 (0.18, 0.78)			
Lesbian × ever pregnant			0.57 (0.18, 1.80)			
Sex of sexual partners × ever pregnant						
Male and female × ever pregnant						0.69 (0.26, 1.78)
Female only × ever pregnant						0.84 (0.24, 2.91)
No partners × ever pregnant						2.26 (1.37, 3.75)

Note. CI = confidence interval; GED = general equivalency diploma; MSA = metropolitan statistical area; NSFG = National Survey of Family Growth; OR = odds ratio; STI = sexually transmitted infection. The total sample was n = 9581. Missing data was < 1.0% for Papanicolau test in the last 12 months, language, US nativity, receiving a contraceptive method or prescription for a method in the past year, and receiving STI counseling, testing, or treatment in the past year. Missing data was 1.9% for sexual orientation identity. Sex of sexual partners in the past year had no missing values among women aged 21–44 years. Missing values for health insurance status were multiply imputed by the NSFG. All ORs and 95% CIs were adjusted for the NSFG's complex sampling design and weighted to the US population with Stata 12.[26]

[a]Unadjusted for any covariates.

[b]Adjusted for social and economic factors.

[c]Added adjustment for health care indicators.

[d]Added adjustment for statistically significant ($P < .05$) interaction of sexual orientation and reproductive health services use.

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Human Participant Protection

This study was approved by the office of human research administration, Harvard School of Public Health.

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