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Sexual Orientation Differences in Asthma Correlates in a Population-Based Sample of Adults

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To understand what conditions may correlate with asthma diagnoses in the lesbian, gay, and bisexual (LGB) population, we used Massachusetts Behavioral Risk Factor Surveillance System data to construct multivariable logistic regression models separately for LGB individuals and heterosexuals. Current or former smoking and obesity were positively associated with history of an asthma diagnosis among both LGB individuals and heterosexuals. Being underweight (negative correlation) and overweight and reporting frequent symptoms of depression in the preceding 30 days also predicted a history of asthma diagnosis among heterosexuals. (*Am J Public Health.* 2011;101:2233–2244. doi:10.2105/AJPH.2011.300305)

Most research on the health of the lesbian, gay, and bisexual (LGB) population has focused on HIV/AIDS, sexual health, and substance use.[1,2] However, recent studies have documented elevated rates of chronic disease risk factors (i.e., physical inactivity, smoking, alcohol and substance use, obesity, lack of access to health care, and nonuse of preventive care) among LGB people relative to heterosexuals.[3–6] In particular, LGB populations may be at increased risk for asthma, a chronic illness that involves inflammation in the airways.[1]

One analysis revealed that rates of asthma were higher among both male and female members of same-sex couples than among members of male–female couples.[1] Earlier studies showed elevated rates of asthma among some groups of gay, lesbian, and homosexually experienced heterosexual individuals in California and among lesbians and bisexual women in Washington State.[7,8] A more recent analysis of data from the Massachusetts Behavioral Risk Factor Surveillance System (BRFSS) indicates that asthma is disproportionately diagnosed among LGB individuals.[9] We assessed how education, urbanicity, weight status, smoking, access to primary care, anxiety, and depression may correlate with asthma diagnoses in the LGB population to help public health practitioners and health care clinicians provide effective treatment.

METHODS

We used BRFSS data collected between 2001 and 2008 to study 67 359 Massachusetts residents, of whom 2271 (3.4%) reported a gay–lesbian (homosexual) or bisexual identity. Details on sample construction and survey questions are available elsewhere.[9] Risk factors that were significantly associated with an asthma diagnosis in binary or multinomial logistic regression models adjusted for age, gender, and race/ethnicity were included in one final regression model for LGB individuals and one model for heterosexuals. We constructed gender-stratified models to assess differences between men and women. The outcome variable was self-reported history of an asthma diagnosis.

We used sampling weights provided by the Massachusetts Department of Public Health to address variability in sampling and respondent participation. The weighted sample allowed results to reflect the actual state adult household population. All tests of statistical association were 2-tailed, and the alpha level was set to 0.05. Analyses were conducted with SAS statistical software version 9.2 (SAS Institute Inc, Cary, NC). We calculated design-based estimates and confidence intervals (CIs), with sample sizes corresponding to the actual number of participants.

RESULTS

As shown in Table 1, a somewhat larger percentage of LGB respondents than heterosexuals reported a lifetime diagnosis of asthma

TABLE 1—Participants' Demographic and Health Characteristics, by Sexual Orientation: Massachusetts Behavioral Risk Factor Surveillance System, 2001–2008

	Lesbian/Gay/Bisexual (n = 2271), No. (%) or Mean ±SD	Heterosexual (n = 65 088), No. (%) or Mean ±SD
Age, y		
18–24	194 (20.7)	4210 (12.3)
25–34	385 (20.3)	11 660 (19.8)
35–44	668 (28.6)	16 616 (28.5)
45–54	644 (18.7)	17 542 (22.8)
55–64	380 (11.7)	15 060 (16.8)
Gender		
Men	1120 (50.3)	25 387 (49.5)
Women	1151 (49.7)	39 701 (50.5)
Race/ethnicity		
White, non-Hispanic	1877 (81.0)	51 962 (81.5)
Black, non-Hispanic	117 (5.0)	3422 (4.5)
Hispanic	178 (10.0)	6689 (8.5)
Asian/Pacific Islander, Native Hawaiian, or American Indian	84 (4.0)	2535 (5.5)
Educational level		
College	1286 (51.5)	28 320 (47.0)
Some college	512 (25.2)	15 504 (23.3)
High school or equivalent	351 (18.1)	15 944 (23.7)
< high school	121 (5.3)	5239 (6.0)
History of asthma diagnosis		
No	1794 (79.2)	54 617 (84.3)
Yes	470 (20.8)	10 336 (15.7)
Cigarette smoking		
Never	949 (45.5)	33 742 (56.9)
Current/former	1322 (54.5)	31 346 (43.1)
Area of residence		
Rural	248 (20.6)	8336 (22.7)
Urban	2019 (79.4)	56 711 (77.3)
Weight category		
Normal	946 (49.2)	24 456 (41.2)
Underweight	46 (1.5)	970 (1.4)
Overweight	728 (31.0)	21 788 (36.4)
Obese	469 (18.3)	13 721 (21.0)
Current primary care provider		
No	272 (17.2)	7319 (12.6)
Yes	1994 (82.8)	57 646 (87.4)
Symptoms of anxiety		
No	601 (69.9)	16 362 (80.2)
Yes	239 (30.1)	5056 (19.8)
Symptoms of depression		
No	529 (80.2)	13 038 (84.0)
Yes	148 (19.8)	2954 (16.0)
Hours of secondhand smoke exposure in past 7 d	2.89 ±211.4	1.66 ±160.4

Note. Counts are unweighted, and percentages and means are weighted.

(20.8% vs 15.7%), despite a slightly more youthful age distribution in the LBG group. Results from separate partially adjusted logistic regression models (Table 2) indicated that current or former smoking (vs no history of smoking; odds ratio [OR]=1.6; 95% CI=1.0, 2.8) and obesity (vs normal weight; OR=2.2; 95% CI=1.1, 4.5) were associated with history of an asthma diagnosis in the LGB group. Both of these risk factors remained associated with history of an asthma diagnosis (current or former smoking, OR=1.7; 95% CI=1.0, 3.0, and obesity, OR=2.2; 95% CI=1.2, 4.3) when they were included in one final, fully adjusted model. Gender-stratified models revealed no differences between men and women.

By contrast, several risk factors were positively associated with asthma diagnoses in the heterosexual group. Most associations remained similar in magnitude and statistical significance in the fully adjusted model, with a few exceptions. Current or former smoking (OR=1.4; 95% CI=1.0, 1.9), overweight (OR=1.1; 95% CI=1.0, 1.7) and obesity (OR=1.5; 95% CI=1.0, 2.3) versus normal weight, and 15 or more days of depressed feelings in the preceding 30 days (OR=1.7; 95% CI=1.0, 2.8) were positively associated with history of an asthma diagnosis among heterosexuals, whereas being underweight (OR=0.2; 95% CI=0.1, 0.6) was associated with a reduced risk of asthma.

DISCUSSION

To our knowledge, this is the first population-based study to explore correlates of asthma in a large sample of LGB adults and to compare them with correlates for heterosexuals. We identified 2 correlates of history of an asthma diagnosis among LGB individuals: current or former cigarette smoking and obesity. These correlates were also observed among heterosexuals, in addition to underweight, overweight, and current symptoms of depression. Although not easy to change, the risk factors identified for LGB individuals (smoking and obesity) are within an individual's control, as opposed to other factors (e.g., secondhand smoke exposure or residence in an urban area) that may necessitate changes by other people or institutions.

TABLE 2—Adjusted Odds Ratios of History of Asthma Diagnosis Associated With Asthma Risk Factors: Massachusetts Behavioral Risk Factor Surveillance System, 2001–2008

	Lesbian/Gay/Bisexual (n = 2271)		Heterosexual (n = 65 088)	
	Partially Adjusted OR[a] (95% CI)	Fully Adjusted OR[b] (95% CI)	Partially Adjusted OR[a] (95% CI)	Fully Adjusted OR[c] (95% CI)
Cigarette smoking				
Never (Ref)	1.00	1.00	1.00	1.00
Current/former	1.62 (1.01, 2.79)	1.72 (1.01, 2.98)	1.21 (1.07, 1.37)	1.42 (1.04, 1.94)
Hours of secondhand smoke exposure in past 7 d	1.02 (0.99, 1.05)		1.01 (0.99, 1.02)	
Area of residence				
Rural (Ref)	1.00		1.00	
Urban	0.80 (0.38, 1.67)		1.01 (0.87, 1.18)	
Weight category				
Normal (Ref)	1.00	1.00	1.00	1.00
Underweight	1.61 (0.32, 7.97)	1.74 (0.35, 8.76)	0.90 (0.48, 1.69)	0.20 (0.06, 0.62)
Overweight	0.59 (0.31, 1.14)	0.56 (0.29, 1.09)	1.17 (1.01, 1.37)	1.13 (1.01, 1.66)
Obese	2.23 (1.10, 4.52)	2.19 (1.16, 4.31)	1.95 (1.66, 2.29)	1.52 (1.03, 2.26)
Current primary care provider				
No (Ref)	1.00		1.00	
Yes	1.78 (0.71, 4.50)		1.05 (0.84, 1.31)	
Symptoms of anxiety				
No (Ref)	1.00		1.00	1.00
Yes	0.91 (0.31, 2.74)		1.47 (1.10, 1.96)	0.92 (0.59, 1.43)
Symptoms of depression				
No (Ref)	1.00		1.00	1.00
Yes	1.61 (0.46, 5.66)		1.72 (1.18, 2.51)	1.68 (1.01, 2.79)

Note. CI = confidence interval; OR = odds ratio.
[a]Separate models for each variable included age, gender, and race/ethnicity.
[b]Model included age, gender, race/ethnicity, cigarette smoking, and weight.
[c]Model included age, gender, race/ethnicity, cigarette smoking, weight, anxiety, and depression.

The correlation of current symptoms of depression with asthma among heterosexuals but not LGB individuals was unexpected given that a previous Massachusetts study revealed higher rates of depression, at least among bisexual women,[9] Meyer attempted to demonstrate how the stress associated with minority status creates mental health disparities among LGB individuals.[10] Krieger and Sidney demonstrated how discrimination against LGB individuals may be associated with chronic disease.[11] We could not assess the role of discrimination, however, because the mental health questions did not explore minority stress or discrimination against LGB individuals. It is also possible that coping and resilience mitigate the effects of minority stress.[10] Felitti et al. linked adverse childhood events to increased smoking and obesity, providing a possible framework for understanding the current findings.[12]

In a prospective study, Camargo et al.[13] found obesity to be an independent predictor of adult-onset asthma in a general population of women. Studies are needed to determine whether lesbians or bisexual women are at particular risk for asthma as a result of factors related to obesity. To address this issue, we analyzed our data using gender-stratified models and did not see any differences in results.

Limitations of our study include the fact that all data were self-reported. Additional information about timing of diagnosis would be helpful in distinguishing between childhood asthma and adult-onset asthma. Because of the size of the LGB population and the degree of racial/ethnic heterogeneity in Massachusetts, we were unable to assess potential differences between racial/ethnic subgroups within the LGB group included in the study sample, despite awareness that Latinos (and especially Puerto Ricans) and African Americans are disproportionately diagnosed with asthma.[14,15]

With increasing data on risk factors and disease prevalence among LGB individuals, disparities in chronic diseases are emerging as significant areas for further research. Identifying differences in risk factors between LGB individuals and their heterosexual counterparts can help public health practitioners develop effective interventions to reduce or prevent development of chronic diseases such as asthma in the LGB population. Such interventions would likely have a positive impact, reducing asthma rates

among the approximately 150 000 LGB residents of Massachusetts, who as a whole represent 3% of the state's overall adult population.[9,16] ■

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Contributors

The authors jointly conceptualized the study, interpreted findings, contributed ideas, and participated in the writing of the article. S.J. Landers wrote the final version of the article. M.J. Mimiaga analyzed the data.

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Human Participant Protection

No protocol approval was needed for this study; however, a data use agreement was reached with the Massachusetts Department of Public Health that allowed us to use data from the Massachusetts Behavioral Risk Factor Surveillance System in our investigation.

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Off-Label Use of the Female Condom for Anal Intercourse Among Men in New York City

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We surveyed 111 male clients of an HIV/AIDS service organization in New York City in 2008 and 2009. Seventeen percent had used the female condom for anal intercourse; of these, 89.3% had used the female condom with male partners, 21.4% with female partners, and 10.7% with both. Users of the female condom for vaginal intercourse were more likely to use it for anal intercourse (odds ratio=12.7; 95% confidence interval=2.5, 64.9; *P*=.002). The safety and efficacy of the female condom for anal intercourse are unknown and should be evaluated. (*Am J Public Health.* 2011;101:2233–2244. doi:10.2105/AJPH.2011.300260)

The female condom was approved for vaginal use by the Food and Drug Administration in 1993,[1] but not for anal use.[2] Despite inconclusive safety data,[3,4] previous studies found that some men who have sex with men used the female condom for anal intercourse.[3,5,6] We conducted a survey among 111 men to describe and examine predictors of anal use of the female condom.

METHODS

We recruited clients of the health care services at Gay Men's Health Crisis in New York City from December 2008 to June 2009. In stage 1, we recruited 100 men regardless of female condom use to get an estimate of the prevalence of anal use of the device.