Gordon, A. R., Fish, J. N., Kiekens, W. J., Lightfoot, M., Frost, D. M., & Russell, S. T. (2020). Cigarette Smoking and Minority Stress Across Age Cohorts in a National Sample of Sexual Minorities: Results From the Generations Study. *Annals of Behavioral Medicine*. DOI: https://doi.org/10.1093/abm/kaaa079

ABSTRACT

Background: Sexual minority populations in the United States have persistently higher rates of cigarette use than heterosexuals, partially driven by exposure to minority stressors (e.g., discrimination, victimization). Little is known about cigarette use across cohorts of sexual minority adults who came of age in distinctly different sociopolitical environments. **Purpose:** To examine cigarette use and minority stressors across three age cohorts of U.S. sexual minority adults. **Methods**: We used data from The Generations Study, a nationally representative sample (N=1,500) of White, Black, and Latino/a sexual minority adults in three age cohorts (younger: 18-25 years; middle: 34-41 years; older: 52-59 years). Survey data were collected March 2016-March 2017. We used sex-stratified logistic regression models to estimate adjusted odds ratios (aOR) and 95% confidence intervals (95%CI) for associations between age cohort, minority stressors (discrimination, victimization), and two indicators of cigarette smoking (lifetime use, current use). **Results:** Prevalence of current cigarette use in each age cohort was high (younger: 20%, middle: 33%, older: 29%). Relative to the younger cohort, men and women in the middle and older age cohorts had significantly higher odds of lifetime and current smoking (e.g., men, current, aOR [95% CI]: middle=2.47 [1.34, 4.52], older=2.85 [1.66, 4.93]). Minority stressors were independently associated with higher odds of current smoking; when victimization was included, the magnitude of the association between age cohort and current smoking was diminished but remained significant. **Conclusions**: Smoking cessation interventions must consider the role of minority stress and the unique needs of sexual minority people across the life course.

Key Words: Sexual minority; LGB; Cigarette use; Tobacco; Minority stress

INTRODUCTION

Tobacco smoking remains the leading cause of preventable death in the United States and a public health priority for addressing and eliminating health inequities[1,2]. Community and probability samples have documented elevated risk of cigarette smoking among sexual minority individuals (e.g., lesbian, gay, bisexual, queer): sexual minorities in the United States have up to 2.5 times higher rates of cigarette smoking than heterosexuals[3,4]. Notably, public health surveillance data reveal that sexual orientation disparities in cigarette use persist[5,6] despite (a) a decades-long decline in prevalence of cigarette smoking in the United States[1] and (b) recent U.S. social and policy shifts toward greater social acceptance of sexual minorities (e.g., legalization of same-sex marriage)[7]. To address persistent disparities, there is a need to better understand differences in cigarette smoking within sexual minority populations that may drive these disparities.

Despite the recent exponential growth in research on sexual minority health disparities in general and in tobacco use in particular,[8] population-based research on sexual minority tobacco use has often been hampered in its ability to explore heterogeneity within sexual minority populations, including differences by gender, sexual orientation identity, and age cohort. Several studies indicate variation by gender, but findings have been mixed. Although some studies have found sexual orientation disparities in cigarette smoking present among both men and women[5], others have found that sexual orientation disparities vary by gender, with greater sexual orientation disparities among girls and women compared to the disparity among boys and men.[9–12] In addition, some studies identify higher rates of cigarette smoking among bisexual compared to gay and lesbian adults,[3,13,14] with bisexual women particularly at risk,[15] although findings have not always been consistent.[16,17]

Minority stress theory posits that minority stress processes are fundamental drivers of sexual orientation disparities.[18,19] Minority stress processes include exposure to *distal stressors*, such as exposure to discrimination and victimization, which in turn influence *proximal stressors*, such as hyper-vigilance about potential victimization. There is robust evidence that such stressors can trigger a cascade of stress responses, including maladaptive coping behaviors such as cigarette use.[20–22] These minority stress processes must be considered against a backdrop of decades of targeted marketing to sexual minority communities by the tobacco industry[23–25] which also may take advantage of minority stress-related susceptibility to such targeted marketing[26] and contribute to sexual orientation disparities.[27]

Further, different cohorts of sexual minority adults came of age in distinct social and political climates with regards to social acceptance of sexual minority people, accompanying exposures to minority stressors, and tobacco-related norms and regulation. Today's sexual minority young adults came of age in the 2000s, an era of increasing cultural inclusion of sexual minority people[7] and regulatory limitations on advertising tobacco to youth.[28] By comparison, sexual minority adults who came of age in the 1970s may have initiated cigarette use in an era when sexual minority visibility was just emerging (e.g., the first Gay Pride parades) and tobacco industry regulation remained incipient.[29] Only recently has research begun to examine how tobacco use varies by age, with one recent study finding sexual orientation disparities in tobacco use disorder declining with increasing age.[30]

Existing studies have been limited in their ability to examine whether there is variation across different age cohorts of sexual minority adults in their rates of cigarette use and the degree to which cigarette use is associated with minority stressors. Moreover, while several probability samples to date have been able to document cigarette use disparities between sexual minorities and heterosexuals, with one notable exception,[31] most have not been able to examine within-group

differences and how these may be related to distal minority stressors. In one notable exception, McCabe and colleagues found evidence in a nationally representative survey that discrimination attributed to sexual orientation was associated with past-year cigarette smoking among sexual minorities,[31] but called for future research to further elucidate within-group differences. Better understanding of such within-group differences, such as those by gender and age cohort, is crucial to advancing efforts to identify and eliminate tobacco-related health disparities.[32]

This paper presents data from the first national probability survey designed specifically for sampling U.S. sexual minority adults across three age cohorts. Drawing on minority stress theory,[18] we examine current cigarette smoking in this sample and hypothesize that current smoking will vary by gender and sexual orientation with women and bisexual people having elevated odds of cigarette smoking. Further, we hypothesize that lifetime and current cigarette smoking will be more common in the older cohort compared to the younger and middle cohorts and that these associations will be reduced in magnitude when adjusting for exposure to minority stressors.

METHODS

Sample and Procedures

The current study includes data from White, Black, and Latino/a men and women in the Generations Study (n=1,518). The Generations Study is a national probability sample of U.S. sexual minorities in three age cohorts, representing distinct sociopolitical environments in which sexual minorities came of age (younger: ages 18-25 years; middle: 34-41 years; older: 52-59 years). Age cohorts were defined based on when respondents would have experienced key LGBT-related U.S. historical events (for example, the Stonewall uprising, the emergence of the AIDS epidemic, the legalization of same-sex marriage) in the course of their adolescent and emerging adulthood development. For example, those in the oldest cohort were emerging adults during the

post-Stonewall era of collective organizing around sexual identities and heightened visibility of sexual minority populations. The middle cohort, in contrast, experienced emerging adulthood during an era when the Internet was changing the landscape of social interactions and access to information, while the younger cohort experienced emerging adulthood in an era when same-sex marriage was newly becoming institutionalized in states across the country. More details about the sample design can be found in Meyer et al.[33] and Frost et al.[34]

Participants were recruited using a two-step process in which Gallup, Inc. collected a national probability sample using a dual-frame random-digit-dial sampling procedure to sample both landlines and mobile phones. Gallup screened all participants in the national probability sample; those who identified as lesbian, gay, bisexual, or transgender received follow-up screening questions. Participants were eligible for the Generations Study if they (i) identified as lesbian, gay, or bisexual, (ii) were not transgender, (iii) identified their race/ethnicity as Black, Latino/a, or White, (iv) were ages 18-25, 34-41, or 52-59 years, (v) completed a sixth-grade education, and (vi) answered the phone in English. Respondents who identified during screening as transgender were invited to participate in a separate study on transgender health, *TransPop* (www.transpop.org). Notably, some LGB respondents who identified as cisgender on the initial screener later identified with a gender identity other than male or female (e.g., genderqueer) on the survey itself and were included in analyses as described below. Eligible participants who consented received a self-administered online or mailed survey questionnaire covering a broad range of health behaviors, outcomes, and risk and protective factors. Study procedures were approved by the Institutional Review Board of the University of California, Los Angeles.

Gallup screened a total of 366,644 participants between March 2016-March 2017. Of these, 3.5% identified as lesbian, gay, or bisexual; 27% of these met eligibility criteria. Of those eligible, 80% agreed to participate in the survey and of those, 48% completed the survey, for a

total conditional participation rate of 39%. To increase the number of racial/ethnic minority respondent, Black and Latino/a respondents were oversampled using the same procedures in an extended recruitment period (April 1, 2017-March 30, 2018). The final sample of 1,518 included 1,331 participants from the original sample and 187 from the oversample. There was less than 1% missing for all study variables except the discrimination scale (2% missing). We found no significant associations between missingness on the discrimination scale and all other study variables. The present analyses excluded participants who were missing on self-reported lifetime and current cigarette use (n=18), resulting in an analytic sample of 1,500.

Measures

Cigarette Smoking. Outcomes were assessed using two items from the U.S. Behavioral Risk Factor Surveillance System. Participants were instructed not to include use of electronic cigarettes, other tobacco products, or marijuana in their responses. Any lifetime cigarette smoking was assessed with the question "Have you smoked at least 100 cigarettes in your lifetime?" and coded dichotomously (0=no cigarette smoking, 1=any cigarette smoking). Participants were then asked, "Do you now smoke every day, some days, or not at all?"; current cigarette smoking was coded dichotomously following the approach of national surveillance surveys (0=not at all or never smoked, 1=currently smoke every day or some days).[6,35]

Age Cohort. Age cohort was assigned based on date of birth: 18-25 years (younger), 34-41 years (middle), and 52-59 years (older). Cohort parameters were determined based on when respondents would have experienced key LGBT-related U.S. historical events,[33,34] as described above.

Distal minority stressors: Discrimination and victimization. Experiences of day-to-day discrimination were captured with a 9-item scale adapted from Williams and colleagues' Everyday Discrimination Scale [36], which asked frequency over the past year of experiences of unfair

treatment. Response options ranged from 1=never to 4=often (Cronbach's alpha = .91). Victimization experiences in adulthood were assessed using a 6-item scale developed by Herek and colleagues [37] that asks participants to report how often they had experienced verbal or physical violence victimization since they were age 18 years. Response options ranged from 1=never to 4=three or more times (Cronbach's alpha = .82). Both of these measures ask broadly about any unfair treatment or victimization, respectively, without requiring participants to attribute the discrimination to a particular characteristic (e.g., race/ethnicity or sexual orientation); we elected to use these measures of minority stress without attribution based on previous research suggesting that using such attribution may lead to underestimates of discriminatory experiences.[38,39] For both the discrimination and victimization scales, frequency scores were summed to create continuous variables with higher scores indicating more frequent discrimination in the previous year or victimization since age 18, respectively. The survey did not include lifetime measures of discrimination and victimization; thus, these variables were not be included in analyses related to lifetime history of smoking.

Sociodemographic Covariates. Sexual orientation identity was assessed with a widely used measure[40] with response options: straight/heterosexual, lesbian, gay, bisexual, queer, same-gender loving, and other. These were coded as three categories: lesbian/gay, bisexual, and another sexual orientation; by design, those who identified as straight/heterosexual were not included in the Generations Study. Race/ethnicity: Eligible participants for the Generations Study were those who identified as Black or African American, Latino/a or Hispanic, or White; these were the three categories used for analysis. Assigned sex (female/woman or male/man) was the primary stratification variable. As all participants screened into this sample by identifying as non-transgender (i.e., reported their gender aligned with their assigned sex), in this paper we refer to differences between women and men. However, in the main survey some participants also

identified with a non-binary gender identity (e.g., genderqueer); this was included in models as a dichotomous variable (non-binary or binary identity). Annual household income was collected using twelve category responses ranging from "Under $720" to "$240,000 and over." Average values were calculated for each household income range ($720 and $240,000 representing the lowest and highest values, respectively). These household income estimates were adjusted for household size and scaled to represent three-person households based on 2016 U.S. median household income ($57,617)[41] following the Pew Research Center's approach [42]. U.S. median household income from 2016 was selected to match the Generations Study data collection period. Urbanicity was measured based on participants' residential zip codes and classified using the USDA Rural-Urban Commuting Area (RUCA) coding system (coded 1-10, with each delineating a degree of urbanicity/rurality from major metropolitan areas to rural areas; higher numbers indicate greater rurality/lower commuting flow into the area) [43].

Statistical Analysis

Analyses were conducted July 2018-February 2019 with Stata 15.1 and weighted to produce nationally representative estimates of the target population. Base weights were first calculated for the Gallup sample frame for the timeframe included in this study (2016-2018) in multiple stages. The sample was initially weighted to represent the aged 18+ U.S. population; the weighting process then accounted for multiple stages of selection and non-response (for more on the Generations study methods, see www.generations-study.com/methods). This resulted in weights that allow estimates to be generalizable to the U.S. population of sexual minority adults ages 18-25, 34-41, and 52-59 during data collection.

Our analyses first examined cigarette smoking prevalence and bivariate associations among demographic characteristics, minority stressors, and cigarette smoking. We used stepwise logistic regression models to estimate adjusted odds ratios and 95% confidence intervals (aOR;

95%CI) for associations between age cohort, minority stressors, and both cigarette smoking outcomes. Based on prior research indicating differences between women and men in sexual orientation disparities in cigarette use,[9–11] we ran multivariable analyses separately by assigned sex. Models were adjusted for non-binary gender, race/ethnicity, sexual orientation identity, scaled household income, and RUCA score. For current cigarette smoking only, Model 1 adjusted for demographic characteristics and we then added the minority stressors to the model (Model 2) to examine the extent to which observed age cohort associations with cigarette smoking were affected by inclusion of minority stressors. Minority stressors were not included in models for lifetime cigarette smoking due to lack of temporally-appropriate measures (i.e., participants were only asked to report exposure to minority stressors in the previous year; however, lifetime cigarette smokers may not have smoked in the previous year). Sensitivity analyses were conducted to examine the independent effects of each minority stressor in the model. Effect estimates were similar so we present models with both variables included. Multiple imputation was used to account for missing data on covariates with 50 imputation draws, using *mi estimate* in Stata.

RESULTS

Weighted estimates indicated that 47% of the sample identified as gay/lesbian, 40% as bisexual, and 13% as another sexual orientation identity (Table 1). The weighted prevalence of lifetime smoking in the sample was 41.8%, while the prevalence of current cigarette smoking was 24.6%. As displayed in Table 1, both lifetime and current cigarette smoking prevalence varied across age cohorts at the bivariate level, with the majority of those in the older and middle cohorts (62.5% and 58.8%, respectively) reporting a lifetime history of smoking, compared to less than one third of those in the younger cohort (30.4%; $p<.0001$). Prevalence of current smoking was highest among those in the middle cohort (33.2%), followed by the older (29.4%) and younger (20.3%) cohorts ($p<.0001$).

Lifetime and current cigarette smoking varied across demographic characteristics and exposure to minority stressors (see Table 2). For example, lifetime smoking prevalence was highest among White participants (45%) followed by Latinx (37%) and Black (35%) participants ($p<.02$); however, no statistical differences were observed in current cigarette smoking. Participants in the lower-income group had strikingly elevated prevalence of both lifetime and current cigarette smoking compared to those in the middle- and higher-income groups. Current smokers had higher mean levels of day-to-day discrimination (*M*s=2.2 vs. 2.0, $p=.003$) and victimization (*M*s=2.4 vs. 1.8, $p<.0001$).

In adjusted multivariable logistic regression models predicting any lifetime cigarette smoking (Table 3), women in the older cohort had over six times higher odds and those in the middle cohort had over five times higher odds of lifetime smoking relative to women in the younger cohort. Men in the older cohort had five times higher odds and those in the middle cohort had nearly three times higher odds of lifetime smoking relative to men in the younger cohort. No differences were observed in lifetime smoking history across sexual orientation, although variation was observed by race/ethnicity for women and socioeconomic position for both men and women (see Table 3).

In multivariable models predicting any current cigarette smoking, odds of current smoking were 2.4 times higher for women in the middle age cohort relative to the younger age cohort (Table 4, Model 1). Among men, patterns were similar, with significant elevated odds for men in both the middle and older age cohorts relative to the younger cohort. When minority stressors were included in models the observed associations between age cohort and smoking status were modestly lower (Table 4, Model 2). Among women, although day-to-day discrimination was associated with smoking status when added independently (not shown), once the victimization scale was added to the model, the effect estimate for day-to-day discrimination became non-

significant and only victimization remained significant. Among men, when minority stressors were added to the model there was a minor decrease in the magnitude of the association between age cohort and smoking status; the aORs for the minority stressors had confidence intervals that crossed the null.

DISCUSSION

Findings from this analysis of a national probability sample of sexual minority adults across three age cohorts offer further evidence of the persistence of longstanding sexual orientation disparities in cigarette use. Across the sample, nearly one in four reported current cigarette smoking, compared to 15.5% of U.S. adults in the general population in the same year.[6] The prevalence was also higher in each age cohort compared to similar (albeit not identical) age groups of U.S. adults: The 2016 National Health Interview Survey (NHIS) found 14.7% of U.S. adults 18-24 years old, 20.6% of those 25-44 years old, and 19.3% of U.S. adults 45-64 years old were current smokers[6] (compared to our sample in which 20.3%, 33.2%, and 29.4% of sexual minorities in our younger, middle, and older age cohorts, respectively, were current smokers). Our prevalence estimates are higher than NHIS prevalence estimates for sexual minority adults (20.5%[6]), possibly due to our restricted age range (NHIS lowest cigarette prevalence was among adults ages 65 years and older; the Generations Study only included those under 60 years).

Our study offers novel insights into differences in both lifetime and current cigarette smoking across three distinct age cohorts of sexual minority people (i.e., "age effects"). Although a cross-sectional study like this one is not able to disentangle cohort effects or period effects from age effects, it is important to note that, by design, the three age cohorts in this study represent sexual minority people who came of age in distinctly different social and political environments with regard to sexual minority rights and societal acceptance. The majority of sexual minority adults in the middle and older cohorts reported ever having smoked cigarettes, as would be

anticipated given that older cohorts have more life years in which to have tried smoking and were more likely to have initiated cigarette use during periods when smoking was normative in the United States.[29] However, even in the younger cohort (18-25 years in 2016), one in three reported a history of cigarette smoking. These prevalence estimates reflect well-documented [3,11,44] heightened risk of cigarette smoking in sexual minority compared to heterosexual populations. Notably, the gap between lifetime and current cigarette use could indicate that cigarette smoking cessation has been successful for a substantial proportion of sexual minorities who were smokers. The gap between lifetime and current smoking was greatest in the older cohort but even in the younger cohort about 10% reported a lifetime history but no current smoking.

We also observed that age cohort differences in lifetime cigarette use were greater magnitude among sexual minority women, relative to sexual minority men, with older women having higher odds of smoking relative to younger women than the gap among men. This suggests a need to think not only about smoking cessation interventions targeted to sexual minority populations broadly[45] but about targeting by gender. Given that cigarette use is a key risk factor for multiple cancers, practical implications of these gender differences underscore the need to ensure cancer screening initiatives are effectively targeted to sexual minority women in general, and older sexual minority women in particular. Extensive research has demonstrated a range of stigma-related barriers to healthcare, including cancer screenings, for sexual minority women.[46,47] Reducing stigma-related barriers to routine screening and healthcare could increase both cancer screening and access to health care provider-delivered smoking cessation interventions.

Notably, in this probability sample of sexual minorities there were no differences in cigarette smoking among sexual minority identity subgroups, in contrast to some previous research and national surveillance surveys that have found elevated prevalence of current cigarette use among bisexual compared to lesbian/gay populations,[13,14] and particularly among adolescent

girls and young women.[9,10,17,48] Although several prior studies show sexual orientation disparities for bisexual relative to lesbian/gay adults, differences between these two groups are typically not statistically tested. These findings underscore the importance of continuing to explore heterogeneity within sexual minority populations to better understand variation in risk factors and underlying drivers of cigarette use in these vulnerable populations. For example, although not a focus of this analysis, we did observe notable differences by household income, with lower income sexual minority people at greatest risk of cigarette use. This finding aligns with a robust body of research on cigarette use and socioeconomic position[49] and extends this research to demonstrate the same patterns among sexual minorities. Future research should explore opportunities for tailored smoking cessation interventions for lower income sexual minority populations.

Previous research on the role of distal minority stressors in cigarette smoking has indicated that discrimination and victimization are associated with cigarette smoking, particularly in adolescents with research in adult samples less conclusive.[4,50] One recent study with a nationally representative sample of adults observed associations between self-reported discrimination due to sexual orientation and past-year cigarette smoking.[31] Our findings support these findings and extend them by documenting the association between current smoking and overall self-reported discrimination, not just that which participants believe was linked to their sexual orientation. As has been discussed extensively by scholars of discrimination,[39,51] both approaches (i.e., discrimination with and without attribution to specific targets) are necessary to improving our understanding of the health consequences of discrimination. Our findings in concert with previous research affirms the importance of including distal minority stressors such as discrimination and victimization, whether attributed to sexual orientation or not, in research on cigarette smoking disparities.

Additionally, in our analysis of the role that minority stressors may play in observed cohort differences in cigarette use within this sexual minority sample, we found that both day-to-day discrimination and victimization experiences were associated with current cigarette use at the bivariate level. In multivariable models, victimization partially contributed to the associations between age cohort and current cigarette smoking, particularly among women. This suggests that minority stressors may be one set of factors involved in the persistence of higher smoking prevalence among older sexual minorities, creating barriers to smoking cessation or exacerbating the need for cigarette use as a coping mechanism for recent or past experiences of discrimination.

Limitations

Findings must be interpreted in light of several limitations. Data are cross-sectional and based on self-report; we hypothesized minority stressors may mediate the association between age cohort and cigarette smoking but, as with all survey research, we cannot establish temporal ordering and reverse causation remains a possibility (e.g., smokers may spend time in more public environments than non-smokers and thus be more likely to be exposed to discrimination or be victimized). Further, we did not have data on lifetime exposure to discrimination and victimization; thus, we were not able to include the role of minority stressors in the models looking at age cohort differences in lifetime cigarette smoking. Another key limitation is that our survey did not include questions on e-cigarette use/vaping, thus we cannot know how much of the difference between the younger and older cohorts could be made up for by higher rates of e-cigarette use in the younger cohort. This form of tobacco use has been rising dramatically in recent years especially among adolescents and young adults.[52,53] Emerging evidence suggests e-cigarette prevalence may be disproportionately high among sexual minority adults relative to heterosexuals[53,54] although findings are inconsistent[55] and more research on this topic is needed. These analyses also were not able to address and thus leave open some important questions for

future research to address—particularly the entangled role of both minority stress experiences *and* the continued insidiousness of targeted tobacco industry marketing to sexual and gender minority youth and adults.[56]

CONCLUSION

This study offers an important picture of cigarette smoking in a U.S. national probability sample of sexual minorities in three age cohorts. Our findings urge public health practitioners and health care providers to consider how the distinctive experiences of sexual minorities of different age cohorts may influence health-related behaviors, with important implications for smoking prevention and cessation interventions. There have been notable steps forward in recent years to produce smoking prevention campaigns tailored to sexual and gender minority youth (e.g., the U.S. Food and Drug Administration's This Free Life campaign[57]). However, given the elevated prevalence of cigarette use in the younger cohort in this study, compared to the general population prevalence for U.S. young adults, and given the rise in e-cigarette use and vaping in the U.S., both tailored and universal prevention measures (e.g., regulations) will continue to be essential.

Smoking cessation interventions should consider the role of minority stress and the unique needs of sexual minorities across the life course. In particular, smoking cessation interventionists should consider ways to address unique generational experiences for sexual minority populations, including both current exposure to minority stressors and histories of exposure to anti-LGBT bias. Recognizing both shared experiences of minority stressors among sexual minorities, as well as variation in experiences and health-related behaviors linked to an array of intersecting identities and histories, will be essential in advancing health equity.

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TABLES

Table 1. Sample characteristics by age cohort[a] in a probability sample of sexual minorities (n=1,500)

	Total			Younger (n=665)			Middle (n=367)			Older (n=468)			p-value*
	n	%w	(95% CI)	n	%w	(95% CI)	n	%w	(95% CI)	n	%w	(95% CI)	
Gender													**< .0001**
Women	804	59.9	(56.8 , 62.9)	394	65.4	(61.2 , 69.4)	203	58.8	(52.7 , 64.7)	207	41.4	(36.4 , 46.6)	
Men	696	40.1	(37.1 , 43.2)	271	34.6	(30.6 , 39.8)	164	41.1	(35.3 , 47.3)	261	58.6	(53.4 , 63.6)	
Non-binary gender identity													**< .0001**
Binary gender identity	1406	92.5	(90.5 , 94.1)	604	90.1	(87.0 , 92.5)	350	96.4	(94.2 , 97.8)	452	96.4	(93.4 , 97.9)	
Nonbinary/Genderqueer	94	7.5	(5.9 , 9.5)	61	9.9	(7.5 , 13.0)	17	3.6	(2.2 , 5.8)	16	3.6	(2.1 , 6.2)	
Sexual Orientation Identity													**< .0001**
Gay/ Lesbian	821	46.9	(43.8 , 50.1)	244	36.6	(32.5 , 41.0)	201	50.3	(44.2 , 56.6)	376	79.7	(75.1 , 83.6)	
Bisexual	489	40.5	(37.3 , 43.7)	300	47.7	(43.2 , 52.1)	123	40.0	(34.0 , 46.3)	66	15.2	(11.7 , 19.4)	
Another sexual orientation	179	12.6	(10.7 , 14.9)	115	15.7	(12.9 , 19.0)	40	9.7	(6.9 , 13.3)	24	5.1	(3.3 , 8.0)	
Race/Ethnicity													**< .0001**
White	970	62.2	(59.1 , 65.2)	362	56.4	(51.2 , 60.7)	231	64.9	(59.0 , 70.5)	377	79.6	(74.9 , 83.6)	
Black or African American	235	16.5	(14.3 , 18.9)	125	17.9	(14.9 , 21.4)	68	18.0	(13.8 , 23.0)	42	9.6	(6.9 , 13.4)	
Hispanic or Latino/a	295	21.3	(18.9 , 24.0)	178	25.7	(22.1 , 29.6)	68	17.1	(13.1 , 22.0)	49	10.7	(7.8 , 14.6)	
Household income[b]													**< .0001**
Lower-income	467	39.6	(36.5 , 42.8)	281	45.9	(41.5 , 50.4)	90	33.7	(27.7 , 40.2)	96	24.2	(19.8 , 29.4)	
Middle-income	551	35.5	(32.6 , 38.6)	273	37.5	(33.3 , 41.8)	133	32.6	(27.3 , 38.4)	146	31.9	(27.3 , 36.9)	
Upper-income	481	24.9	(22.4 , 27.5)	111	16.6	(13.6 , 20.2)	144	33.7	(28.4 , 39.5)	226	43.8	(38.8 , 49.0)	
Outcomes													
Lifetime smoking[c]	669	41.8	(38.8 , 45.0)	190	30.4	(26.4 , 34.7)	200	58.8	(52.7 , 64.6)	279	62.5	(57.4 , 67.2)	**< .0001**
Current smoking[d]	333	24.6	(21.9 , 27.5)	120	20.3	(16.9 , 24.3)	100	33.2	(27.4 , 39.6)	113	29.4	(24.5 , 34.7)	**<.0001**
	M	(SD)		M	(SD)		M	(SD)		M	(SD)		
Urbanicity													
RUCA score[e]	1.72	(1.87)		1.75	(1.60)		1.58	(1.83)		1.76	(2.63)		.93
Minority stressors													
Day-to-day discrimination[f]	2.04	(.73)		2.16	(.61)		2.00	(.78)		1.63	(.78)		**< .0001**
Victimization[g]	1.97	(.84)		1.85	(.68)		2.22	(.94)		2.11	(1.13)		**< .0001**

* Boldface indicates statistical significance ($p<0.0001$). P-values are for differences across generations. P-values based on chi-square tests for demographic characteristics and categorical outcomes; based on ANOVA F-tests for continuous predictor variables.

a. Age cohorts defined as: Younger = 18-25 years; Middle = 34-41 years; Older = 52-59 years

b. Income: Based on annual household (HH) income, adjusted for household size, and scaled in relation to median U.S. household size (per Pew Research Center 2015). Lower income = <2/3 U.S. median HH income; Middle income = 2/3 – double U.S. median HH income; Upper income = > double U.S. median HH income.

c. Respondents were asked "Have you smoked at least 100 cigarettes in your entire life?" (Yes/No) Respondents were asked to *exclude* any use of e-cigarettes, cigars, or other tobacco products.

d. Respondents who endorsed smoking at least 100 cigarettes were asked "Do you now smoke cigarettes every day, some days, or not at all?" Responses were dichotomized: Every day or some days = Current smoker; Not at all or never smoked = Not current smoker.

e. RUCA=Rural-Urban Commuting Area (score range: 1-10). USDA-created system to delineate degree of urbanicity/rurality based on level of commuting flow into an area; higher scores indicate grater rurality/lower commuting flow into area.

f. Victimization: mean score of 6 items about frequency of victimization experiences since age 18 (range: 1-4; higher scores = more victimization experiences)

g. Day-to-day discrimination: mean score of 9 items about frequency of unfair treatment in a variety of settings in past year (range: 1-4; higher scores = more experiences of discrimination)

Table 2. Prevalence of lifetime and current cigarette smoking by sociodemographic characteristics among U.S. sexual minorities (n=1,500)

	Lifetime cigarette smoking[a]			**Current cigarette smoking[b]**		
	% (wtd)	**95% CI**	***p-value***	**% (wtd)**	**95% CI**	***p-value***
Gender			0.87			0.70
Women	42.0	(37.8, 46.3)		25.0	(21.4, 29.1)	
Men	41.5	(37.1, 46.0)		23.9	(20.2, 28.1)	
Non-binary gender identity			0.08			0.29
Binary gender identity	42.6	(39.4, 45.9)		25.0	(22.2, 28.1)	
Genderqueer/non-binary	32.0	(22.3, 43.6)		19.0	(11.3, 30.4)	
Sexual orientation identity			0.70			0.62
Gay/ Lesbian	42.7	(38.5, 47.0)		24.7	(21.1, 28.7)	
Bisexual	41.6	(36.4, 47.0)		24.8	(20.3, 29.9)	
Another sexual orientation	38.5	(30.5, 47.1)		20.6	(14.4, 28.7)	
Race/Ethnicity			**0.02**			0.64
White	45.2	(41.2, 49.2)		25.4	(22.0, 29.2)	
Black or African American	35.2	(28.4, 42.7)		24.5	(18.6, 31.6)	
Hispanic or Latino/a	37.1	(30.9, 43.8)		22.2	(16.9, 28.5)	
Socioeconomic position[c]			**<.0001**			**<.0001**
Lower income	50.7	(45.3, 56.1)		36.1	(31.0, 41.6)	
Middle income	36.7	(32.0, 41.6)		19.5	(15.8, 23.8)	
Higher income	35.1	(30.1, 40.4)		13.5	(10.2, 17.6)	
Minority stressors	**M**	**(SD)**	***p-value***	**M**	**(SD)**	***p-value***
Everyday discrimination[d]			0.18			**0.003**
No to smoking	2.01	(0.03)		1.99	(0.72)	
Yes to smoking	2.07	(0.04)		2.17	(0.74)	
Victimization[e]			**p<.0001**			**p<.0001**
No to smoking	1.76	(0.72)		1.85	(0.79)	
Yes to smoking	2.26	(0.92)		2.36	(0.87)	

* Boldface indicates statistical significance (p<.05). P-values are for differences within each demographic category. P-values based on chi-square tests for demographic characteristics and categorical outcomes and on ANOVA F-tests for continuous predictor variables.

a. Respondents were asked “Have you smoked at least 100 cigarettes in your entire life?” (Yes/No). Respondents were asked to *exclude* any use of e-cigarettes, cigars, or other tobacco products.

b. Respondents who endorsed smoking at least 100 cigarettes were asked “Do you now smoke cigarettes every day, some days, or not at all?” Responses were dichotomized: Every day or some days = Current smoker; Not at all or never smoked = Not current smoker.

c. Socioeconomic position: Based on annual household (HH) income, adjusted for household size, and scaled in relation to median U.S. household size (per Pew Research Center 2015). Lower income = <2/3 U.S. median HH income; Middle income = 2/3 – double U.S. median HH income; Upper income = > double U.S. median HH income.

d. Victimization: mean score of 6 items about frequency of victimization experiences since age 18 (range: 1-4; higher scores = more victimization experiences).

e. Day-to-day discrimination: mean score of 9 items about frequency of unfair treatment in a variety of settings in past year (range: 1-4; higher scores = more experiences of discrimination).

Table 3. Multivariable models predicting any lifetime history of smoking[a] in a sample of sexual minorities (n=1,500)

	Women			***Men***		
	OR	(95% CI)		OR	(95% CI)	
Age cohort						
Younger (Ref)	1.00			1.00		
Middle	**5.56**	**(3.62**	**, 8.54)**	**2.81**	**(1.63**	**, 4.84)**
Older	**6.21**	**(3.70**	**, 10.42)**	**4.96**	**(2.94**	**, 8.34)**
Sexual orientation identity						
Gay/Lesbian (Ref)	1.00			1.00		
Bisexual	1.06	(0.68	, 1.68)	1.20	(0.73	, 1.97)
Another SO	1.40	(0.72	, 2.72)	1.61	(0.65	, 3.94)
Binary gender						
Binary woman/man (Ref)	1.00			1.00		
Nonbinary/Genderqueer	0.56	(0.26	, 1.20)	0.87	(0.34	, 2.23)
Race/ethnicity						
White (Ref)	1.00			1.00		
Black or African American	**0.50**	**(0.30**	**, 0.84)**	0.86	(0.46	, 1.61)
Hispanic or Latino/a	0.67	(0.40	, 1.12)	1.21	(0.73	, 1.99)
Income						
Upper-income (Ref)	1.00			1.00		
Middle-income	**1.68**	**(1.02**	**, 2.79)**	1.56	(0.99	, 2.53)
Low-income	**4.29**	**(2.51**	**, 7.33)**	**2.67**	**(1.51**	**, 4.75)**
Urbanicity						
RUCA Score	1.06	(0.97	, 1.17)	**1.15**	**(1.02**	**, 1.30)**

Boldface indicates statistical significance ($p<0.05$)

[a] Lifetime smoking defined as report of ever having smoked at least 100 cigarettes (5 packs)

Note: Models estimated with weights to be nationally representative and 50 imputations to account for missing data on covariates.

Table 4. Multivariable models predicting current cigarette smoking[a] in a sample of sexual minorities (n=1,500)

	Women						***Men***					
	Model 1			Model 2			Model 1			Model 2		
	OR	*95% CI*		*OR*	*95% CI*		*OR*	*95% CI*		*OR*	*95% CI*	
Age cohort												
Younger (Ref)	1.00			1.00			1.00			1.00		
Middle	**2.38**	**(1.45**	**, 3.89)**	1.64	(0.94	, 2.84)	**2.47**	**(1.34**	**, 4.52)**	**2.23**	**(1.17**	**, 4.28)**
Older	1.59	(0.90	, 2.82)	1.27	(0.66	, 2.44)	**2.85**	**(1.66**	**, 4.93)**	**2.63**	**(1.44**	**, 4.81)**
Sexual orientation (SO)												
Gay/Lesbian (Ref)	1.00			1.00			1.00			1.00		
Bisexual	0.77	(0.46	, 1.27)	0.60	(0.36	, 1.02)	1.09	(0.60	, 1.96)	1.03	(0.56	, 1.93)
Another SO	0.81	(0.40	, 1.64)	0.73	(0.36	, 1.50)	1.47	(0.56	, 3.83)	1.41	(0.54	, 3.74)
Binary gender												
Binary woman/man (Ref)	1.00			1.00			1.00			1.00		
Nonbinary/Genderqueer	0.62	(0.25	, 1.56)	0.47	(0.17	, 1.23)	1.04	(0.35	, 3.11)	1.02	(0.33	, 3.13)
Race/ethnicity												
White (Ref)	1.00			1.00			1.00			1.00		
Black or African American	0.63	(0.36	, 1.09)	0.64	(0.36	, 1.16)	1.16	(0.60	, 2.25)	1.12	(0.55	, 2.30)
Hispanic or Latino/a	0.68	(0.37	, 1.24)	0.74	(0.38	, 1.43)	1.17	(0.64	, 2.13)	1.19	(0.64	, 2.21)
Income												
Upper-income (Ref)	1.00			1.00			1.00			1.00		
Middle-income	1.78	(0.90	, 3.52)	1.55	(0.80	, 3.00)	**2.25**	**(1.33**	**, 3.81)**	**2.07**	**(1.20**	**, 3.56)**
Low-income	**4.97**	**(2.52**	**, 9.77)**	**3.81**	**(1.96**	**, 7.43)**	**4.72**	**(2.56**	**, 8.69)**	**3.96**	**(2.10**	**, 7.46)**
Urbanicity (RUCA score)	1.08	(0.98	, 1.20)	1.10	(0.99	, 1.22)	**1.16**	**(1.02**	**, 1.32)**	**1.16**	**(1.02**	**, 1.30)**
Day-to-day discrimination				1.08	(0.73	, 1.62)				1.06	(0.68	, 1.65)
Victimization				**2.15**	**(1.59**	**, 2.91)**				1.31	(0.95	, 1.80)

Boldface indicates statistical significance ($p<.05$)

[a] Current smoking coded as: 0 = Not at all or never smoked; 1 = Smoke some days or every day

Note: Models estimated with weights to be nationally representative and 50 imputations to account for missing data on covariates. Model 1 includes key demographic covariates. Model 2 includes the addition of distal minority stressors (day-to-day discrimination in the past year, victimization since age 18).