

An Integrated Approach to Measuring Sexual Orientation Disparities in Women's Access to Health Services: A National Health Interview Survey Application

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Abstract

Purpose: The extent to which disparities affect all sexual minority women (SMW) versus specific subgroups of lesbian, bisexual, or other women remains unclear, in part due to inconsistent analysis of available data. We propose an integrated approach that aggregates subgroups to maximize power to detect broadly applicable disparities, then tests for subgroup heterogeneity, exercising caution with disaggregation when there is no direct evidence of heterogeneity.

Methods: Multivariate analyses of 2014–2015 National Health Interview Survey data examined six barriers to care. We compared heterosexual women ($n = 36,474$) with SMW ($n = 1048$) overall and tested for heterogeneous outcomes among subgroups of SMW compared with heterosexual women and with each other.

Results: Controlling for sociodemographics and health status, aggregated analyses showed that SMW were more likely than heterosexual peers to have trouble finding a provider (adjusted percentages 5.1% vs. 3.2%, $p < 0.01$) and no optimal usual place of care (14.5% vs. 11.2%, $p < 0.01$). There was no evidence of subgroup heterogeneity for either barrier, suggesting uniform disparities for SMW. In contrast, only lesbian/gay women were more likely than heterosexual women to be told their health insurance was not accepted ($p = 0.03$); this was the only outcome for which the adjusted difference between bisexual and lesbian/gay women was significant (2.8% vs. 6.3%, $p = 0.02$).

Conclusion: Analyses that only disaggregated data would have understated overall sexual minority disparities and perhaps overstated subgroup differences; an integrated approach can more accurately characterize disparities experienced by all SMW versus those specific to certain subgroups. Large national surveys should include sexual orientation questions to support adequately powered comparisons.

Keywords: health disparities, methods, National Health Interview Survey, sexual minority women

Introduction

LESBIAN AND BISEXUAL WOMEN (collectively “sexual minority women,” SMW) experience health care barriers more often than heterosexual women^{1–4} and experience unique subgroup disparities.^{5,6} In particular, the distinct challenges faced by bisexual women, which may reflect biphobic stereotypes (e.g., increased promiscuity with both men and women) and “double discrimination” (from both heterosexual and lesbian/gay communities⁷), further underscore the need to disentangle when disparities affect all

SMW versus a specific subgroup. Researchers studying health care disparities for SMW face difficult methodological trade-offs. Some researchers only combine data from multiple subgroups of SMW (e.g., lesbian/gay women and bisexual women) to generate larger samples. Although this enables reliable comparisons between heterosexual and SMW collectively, it can fail to detect disparities that are limited to specific sexual minority subgroups. Other researchers only disaggregate SMW into subgroups and then estimate the disparities for each subgroup compared with the larger heterosexual reference group. When sample sizes

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are small, these disparity estimates have large standard errors and can be subject to familywise type-I errors, especially among the smallest subgroups of women.

Some disaggregated analyses infer differences between subgroups of women based only on two p values falling on different sides of the $p < 0.05$ threshold when each subgroup is compared with heterosexual women. This can lead to questionable conclusions that disparities exist for only one subgroup, even when the point estimates for the sexual minority subgroups are statistically indistinguishable, and the difference in statistical significance may be attributable to the larger sample size of one subgroup. This approach may fail to detect the breadth of disparity that applies equally across subgroups because of the loss of power through disaggregation. It may also overstate differences between subgroups because differences in statistical significance provide weak evidence of heterogeneity across subgroups.

In this article, we propose an integrated approach to answer two research questions. First, are there disparities in access to care for SMW compared with heterosexual women? Second, do these disparities differ by subgroups of SMW? We address these questions using 2014–2015 National Health Interview Survey (NHIS) data, comparing SMW with heterosexual counterparts with respect to six barriers to care. We first aggregate subgroups of SMW to maximize the power to detect broadly applicable disparities and then directly test for heterogeneity among subgroups of SMW, disaggregating confidently when there is direct evidence of differences and cautiously interpreting subgroup differences that lack direct evidence of heterogeneity. This integrated approach combines the power of aggregation with the specificity of disaggregation but exercises caution with disaggregation when there is weak evidence of heterogeneity. This approach provides a useful road map to strengthen both the evidence base to address health disparities experienced by all SMW as well as those experienced by specific subgroups.

Methods

Data source

We performed a cross-sectional analysis of 2014–2015 NHIS data,⁸ with 20,299 (2014) and 18,601 (2015) completed in-person interviews by Census Bureau staff. One adult is randomly selected from each sampled household for an interview. Because these data contain no patient identifiers, the RAND institutional review board found our study to be exempt from review.

Measures

The outcomes were six measures of access to care. Respondents were asked, “Is there a place that you usually go to when you are sick or need advice about your health?” Those who responded “no” were coded as not having a usual place of care. Respondents who reported having a usual place of care were asked whether it was a clinic or health center, doctor’s office or health maintenance organization, hospital outpatient department (all classified as having an optimal usual place of care), hospital emergency room, or some other place (classified as not optimal).⁹ Respondents also reported whether they had trouble finding a provider in the past 12 months, were told they would not be accepted as a

new patient, or that their health care coverage was not accepted. Finally, respondents were asked, “During the past 12 months, was there any time when you needed any of the following, but didn’t get it because you couldn’t afford it?” followed by a list of six yes/no items: prescription medications, mental health care or counseling, dental care (including checkups), eyeglasses, seeing a specialist, and follow-up care. Those who responded “yes” to one or more of the six items were coded as having been unable to afford needed care in the past 12 months.

For sexual orientation (the independent variable), survey respondents were asked, “Which of the following best represents how you think of yourself?” Following recent guidance,¹⁰ we distinguished responses of “straight, that is, not lesbian or gay” (“heterosexual women” hereafter) from responses of “gay or lesbian,” “bisexual,” or “something else” (SMW hereafter). Individuals who responded, “I don’t know the answer” or did not answer were excluded.

Finally, our analyses controlled for year and sociodemographic and health variables (see Table 1 for complete details regarding each measure): age (continuous plus seven indicators to capture nonlinear relationships); six-category education; Medicaid; income $< 200\%$ of the federal poverty level (FPL)^{11,12}; employment (full-time, part-time, unemployed, out of labor force); marital/partnership status (married/living with partner, formerly married, never married); race/ethnicity (any Hispanic, plus non-Hispanic White, Black, Asian, or Other); region (midwest, northeast, south, west); fair/poor self-rated health; functional limitation (difficulty with any of 12 activities); 14 health conditions (hypertension, high cholesterol, coronary heart disease, angina, heart attack, other heart condition, stroke, emphysema, chronic obstructive pulmonary disease, asthma, ulcer, cancer, diabetes/prediabetes, and arthritis/rheumatoid arthritis/gout/lupus/fibromyalgia); body mass index category (underweight, healthy weight, overweight, obese); and severe psychological distress (13+ on Kessler 6 Psychological Distress Scale¹³).

Statistical analysis

Multivariate regression models (logistic for dichotomous outcomes) predicted six outcomes, separately, from sexual orientation (“sexual minority” vs. “heterosexual”) and covariates, using a two-sided alpha level of 0.05 for statistical significance. We employed the NHIS publicly available multiply imputed income; missing categories were included for any other missing covariates. Outcomes were not imputed.

Three models were estimated for each outcome: Model 1 adjusted only for survey year and age; Model 2 adjusted for all sociodemographics; and Model 3 added health status variables. Insurance type (private, Medicaid and other public, Medicare, other, uninsured) was added as an adjuster to all models for the participant being told that their health insurance coverage would not be accepted and to other models in a sensitivity test. Analyses accounted for the NHIS complex sampling design and nonresponse.

We present all results from multivariate logistic regressions as covariate-adjusted percentages using predictive margins.¹⁴ To quantify the population-level magnitude of differences associated with sexual orientation, we describe the percentage of each sexual orientation group (e.g., SMW) predicted to experience a given outcome (e.g., trouble finding a provider) if

TABLE 1. SOCIODEMOGRAPHIC AND HEALTH CHARACTERISTICS BY SEXUAL ORIENTATION, 2014–2015 NATIONAL HEALTH INTERVIEW SURVEY

	Weighted %	
	Heterosexual women (N = 36,474)	SMW (N = 1048)
Age, years		
18–24	11.7***	24.4***
25–34	17.0***	24.0***
35–44	16.4	15.2
45–54	17.6	16.4
55–64	16.6*	12.6*
65–74	11.7***	5.1***
75+	9.0***	2.2***
Education		
Eighth grade or less	4.5**	2.1**
Some high school	8.0	8.5
High school diploma or GED	24.5*	20.2*
Some college or 2-year degree	32.2	35.3
4-Year college degree	19.4	21.2
More than 4-year college degree	11.4	12.7
Insurance type		
Private	64.2	62.3
Medicaid and other public	13.4***	18.8***
Medicare only	7.5***	2.4***
Other	4.7*	3.2*
Uninsured	10.3*	13.3*
Low-income indicators		
Medicaid	13.0**	17.4**
Income <200% of FPL	34.3**	40.4**
Employment		
Full-time	41.7*	47.1*
Part-time	13.7	16.5
Unemployed	3.9***	8.4***
Out of labor force	40.8***	28.0***
Marital/partnership status		
Married or living with partner	58.3***	46.0***
Formerly married	22.5***	11.9***
Never married	19.2***	42.2***
Race/ethnicity		
Hispanic	15.0*	11.4*
Non-Hispanic White	65.6	67.7
Non-Hispanic Black	12.6*	15.7*
Non-Hispanic Asian	5.9***	2.6***
Non-Hispanic other race	0.8**	2.5**
Region		
Midwest	22.4	22.4
Northeast	17.5	14.1
South	38.0	37.9
West	22.1	25.6
General health fair/poor ^a	13.0	14.0
Functional limitation ^b	38.8	40.6
Common health conditions		
Hypertension	30.6***	23.2***
High cholesterol	27.1**	20.8**
Coronary heart disease	3.2	1.9
Angina	1.5	0.7
Heart attack	2.2	2.1
Other heart condition	7.9	7.7

(continued)

TABLE 1. (CONTINUED)

	Weighted %	
	Heterosexual women (N = 36,474)	SMW (N = 1048)
Stroke	2.7	2.7
Emphysema	1.4	1.0
Chronic obstructive pulmonary disease	3.3	2.7
Asthma	14.4***	21.8***
Ulcer	6.6	7.9
Cancer	9.3	9.0
Diabetes or prediabetes	14.1	12.9
Arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia	25.8	26.6
Body mass index category		
Underweight	2.6	2.2
Healthy weight	39.6	36.4
Overweight	28.4*	24.3*
Obese	29.4***	37.1***
Severe psychological distress ^c	3.8***	9.0***

Boldface indicates statistical significance (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ for difference by sexual orientation).

^aResponse of “fair” or “poor” to the following survey item: “Would you say your health in general is excellent, very good, good, fair, or poor?”

^bAn indicator of reporting difficulty with at least 1 of 12 activities [walk a quarter of a mile—about 3 city blocks; walk up 10 steps without resting; stand or be on your feet for about 2 hours; sit for about 2 hours; stoop, bend, or kneel; reach up over your head; use your fingers to grasp or handle small objects; lift or carry something as heavy as 10 pounds such as a full bag of groceries; push or pull large objects like a living room chair; go out to things like shopping, movies, or sporting events; participate in social activities such as visiting friends, attending clubs and meetings, going to parties; do things to relax at home or for leisure (reading, watching TV, sewing, listening to music)].

^cScore of 13+ on the Kessler 6 Psychological Distress Scale (range 0–24).

FPL, federal poverty level; GED, general educational development; SMW, sexual minority women.

each group had the same distribution of covariates as seen in the entire population. To identify differences among sexual minority subgroups, we repeated the three models with separate indicators for lesbian/gay women, bisexual women, and women identifying as “something else” rather than a single combined sexual minority category. An omnibus test assessed whether any differences among the three sexual minority categories could be detected.¹⁵ We also examined the adjusted difference between bisexual and lesbian/gay women (the two largest sexual minority subgroups).

Results

Sample demographics

Among the 37,522 female respondents to the 2014–2015 NHIS who reported their sexual orientation, 97.3% ($n = 36,474$) reported being heterosexual and 2.7% ($n = 1048$) reported being a sexual minority (lesbian/gay = 537, bisexual = 399, and something else = 112); 3.5% ($n = 1378$) did not report their sexual orientation and were excluded from our analysis (“I don’t know” = 221, did not answer = 1157).

Table 1 compares the weighted percentages for heterosexual and SMW by the sociodemographic and health covariates (see Supplementary Table S1 for the distribution within sexual minority subgroups). SMW were substantially younger than their heterosexual counterparts, indicating a need to age-adjust these groups for unbiased comparisons of outcomes (Supplementary Table S2). SMW, and especially bisexual women, were more likely to have Medicaid coverage and report an income <200% of the FPL. SMW were also more likely to never marry, be non-Hispanic Black, and report asthma, obesity, and severe psychological distress.

Aggregated analysis: comparing heterosexual women with all SMW

In Model 1 (Fig. 1; Supplementary Table S3), adjusted only for age and survey year (corresponding odds ratios are presented in Supplementary Table S4), SMW were more likely than their heterosexual counterparts to have no usual place of care (11.9% vs. 9.5%, respectively, $p < 0.05$) and to lack an optimal usual place of care (15.1% vs. 11.2%, $p < 0.01$). SMW were also more likely to report trouble finding a provider (7.0% vs. 3.2%, $p < 0.001$), being told that they would not be accepted as a new patient (5.7% vs. 2.8%, $p < 0.001$), being told that their health insurance was not accepted (5.7% vs. 3.6%, $p < 0.05$), and report not receiving needed care due to cost (26.9% vs. 18.8%, $p < 0.001$).

In Model 2 (Fig. 1; Supplementary Tables S3 and S4), adjusting for additional sociodemographics, only the difference between heterosexual and SMW in lacking a usual place of care became nonsignificant (11.7% vs. 9.5%, $p = 0.06$), although the adjusted percentages changed only slightly. In Model 3 (Table 2; Fig. 1; corresponding odds ratios are presented in Supplementary Table S5), adjusting for health status did not fully account for differences between SMW and heterosexual women in not having an optimal usual place of care (14.5% vs. 11.2%, $p < 0.01$) and having

trouble finding a provider (5.1% vs. 3.2%, $p < 0.01$). Figure 1 illustrates the results from all Models for a subset of measures. Power calculations suggest that these aggregated analyses can detect effects 30% and 40% smaller than those comparing lesbian/gay or bisexual women (respectively) with heterosexual counterparts.

Disaggregated analysis: sexual minority subgroups of women compared with heterosexual women and to each other

The subgroup analysis (Table 2) focused on the fully adjusted Model 3 results. Compared with heterosexual peers, bisexual women more often lacked an optimal usual place of care (11.2% vs. 15.1%, $p < 0.05$) and lesbian/gay women were more likely to have trouble finding a provider (3.2% vs. 6.0%, $p < 0.01$). However, the omnibus test of heterogeneity for both ($p = 0.88$ and $p = 0.45$, respectively) suggests no significant differences among sexual minority subgroups. This, in combination with the significant pooled analysis, suggests that SMW experience both barriers uniformly. Ultimately, the omnibus test for any differences among sexual minority subgroups was significant for only one outcome, being told that their health insurance would not be accepted ($p = 0.03$). This was also the only outcome for which the adjusted difference between bisexual and lesbian/gay women differed significantly from zero (2.8% vs. 6.3%, $p = 0.02$), providing evidence that lesbian/gay women experience this barrier disproportionately. Finally, while lesbian/gay women were more often told that they would not be accepted as a new patient (5.0% vs. 2.8%, $p < 0.05$), there was no evidence of an overall difference between heterosexual women and SMW or that the pattern varied by subgroup or with bisexual women. In sensitivity analyses controlling for insurance, and thus excluding difference in access related to differential access to insurance, coefficients in differences in access were reduced slightly and p values increased slightly (data not shown).

FIG. 1. Access to care by sexual orientation. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Adjusted percentages for heterosexual women were nearly identical across the three sets of adjusters, so we only show the age- and year-adjusted percentages for this group.

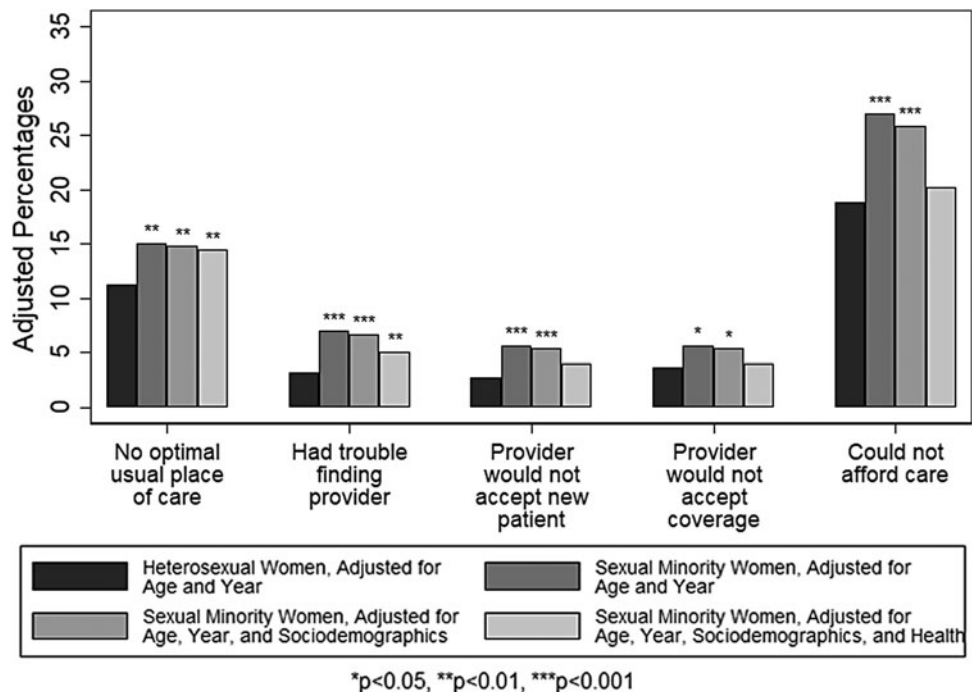


TABLE 2. ADJUSTED PERCENTAGES FOR ACCESS TO CARE BY SEXUAL ORIENTATION (MODEL 3), 2014–2015 NATIONAL HEALTH INTERVIEW SURVEY

	Adjusted ^a percentages by sexual orientation group, with p values for difference from the heterosexual reference group				Adjusted ^a difference between groups		Test for differences among sexual minority groups	
	Heterosexual women (reference group)		All SMW		Bisexual–lesbian/gay (95% CI)		p	
No usual place of care	9.5	11.7	12.2	11.3	11.5	–0.9 (–5.8 to 3.9)		0.93
No optimal usual place of care	11.2	14.5**	13.8	15.1*	14.5	1.3 (–3.8 to 6.4)		0.88
During the past 12 months, had trouble finding a provider who would see you	3.2	5.1**	6.0**	4.2	5.6	–1.8 (–4.8 to 1.2)		0.45
During the past 12 months, told they would not accept you as a new patient	2.8	4.0	5.0*	3.2	3.7	–1.8 (–4.5 to 0.9)		0.62
During the past 12 months, told they did not accept your health care coverage (all models adjusted for all insurance types)	3.7	4.1	6.3*	2.8	0.8**	–3.5* (–6.6 to –0.4)		0.03*
During the past 12 months, could not afford needed care ^b	19.0	20.2	20.8	19.2	21.9	–1.7 (–7.6 to 4.3)		0.82

Boldface indicates statistical significance (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$).

^aAdjusted for year; age; education; Medicaid (except when insurance type is the dependent variable); poverty indicator; employment; marital/partnership status; race/ethnicity; region; indicator of fair/poor health; functional limitation; 14 health condition indicators; indicators of obesity, overweight, and underweight; and psychological distress scale.

^bCould not afford one or more of the following items: prescription medications, mental health care or counseling, dental care, eyeglasses, specialty care, and follow-up care. CI, confidence interval.

Discussion

Our integrated approach underscores barriers affecting all SMW, as well as barriers specific to certain subgroups and how one-subgroup-at-a-time analyses (without pooling and assessing subgroup variation) would have understated overall sexual minority disparities and perhaps overstated subgroup differences. SMW collectively encountered greater barriers than their same-age heterosexual peers on all six measures. While some differences in barriers are associated with health differences, even when controlling for additional sociodemographics and health status, two barriers persisted. Thus, in addition to addressing structural barriers to care such as provider discrimination and limited access to health care insurance,¹⁶ addressing access barriers experienced by all women in poor health may help reduce access barriers for SMW. However, even adjusting for these additional characteristics, SMW collectively reported greater difficulty finding an optimal usual place of care and more trouble finding a provider.

Our findings add to previous research documenting disparities in access to health services for SMW.^{2,3,17} A possible explanation for the observed disparities is that the health care needs of SMW might exceed those of heterosexual women. Consistent with this hypothesis, SMW are at higher risk than heterosexual women for mental health disorders such as depression and anxiety, cardiovascular disease, and uterine and other reproductive cancers.¹⁸ Furthermore, practitioners may not accept sexual minority patients due to inadequate training in cultural competency in the care of SMW^{16,19,20} or unwillingness to provide care to SMW because of prejudicial attitudes.^{21,22} Efforts to improve practitioners' cultural competence and inform SMW about receptive practitioners in their area may reduce the observed disparities in access to health services.

Among all the barriers investigated, we found only one statistically significant difference between subgroups of SMW. The omnibus test provides strong evidence that at least one sexual minority subgroup differed from the others in the likelihood of having their insurance denied. Furthermore, we found that lesbian/gay women were significantly more likely to experience this barrier to care than bisexual women. Studies exploring disparities in insurance coverage among SMW collectively suggest that implementation of the Affordable Care Act and legal recognition of the right of people of the same gender to marry may have led to significant insurance gains among sexual minority individuals,^{5,23} with varied success by state.²⁴ However, it is unclear whether these gains have accrued differently among different subgroups of SMW. Our results suggest that they may have; other research suggests that it may be due, in part, to economic vulnerability, as well as differences in the availability of culturally competent providers.⁵ Previous research found that bisexual women had greater difficulty finding a provider than gay women³ and that they are an especially disadvantaged sexual minority subgroup with respect to health care access and health outcomes.²⁵ More research is needed to understand how the health care needs of lesbian and gay women may differ from those of bisexual women.

An approach focused solely on the statistical significance of each subgroup difference compared with heterosexual woman would have understated the breadth of two barriers

including “no optimal usual place of care” and “trouble finding a provider in the past 12 months.” For these barriers, there was a significant difference from heterosexual women for just one sexual minority subgroup taken alone (bisexual and lesbian/gay women, respectively), but no evidence of heterogeneity among SMW, consistent with a disparity affecting all SMW.

There was strong evidence of differences among sexual minority subgroups in one instance: told that your insurance would not be accepted in the past 12 months. There was no evidence of an overall disparity, but there was evidence of (1) heterogeneity among sexual minority subgroups, (2) a specific disparity for lesbian/gay women, and (3) a difference between lesbian/gay and bisexual women. In contrast, an approach focused solely on the statistical significance of each subgroup difference compared with heterosexual women would have concluded that lesbian/gay women were more likely to be told by a provider that they would not accept them as a new patient. However, the lack of significance in the pooled analysis or in the subsequent tests of subgroup variation underscores the need to interpret this finding cautiously as evidence of a health disparity specific to lesbian/gay women.

Our study highlights the need for additional data collection and methodological advances in measuring sexual minority identity to improve health services research, programs, and policies. Although we found few differences among sexual minority subgroups, we were constrained by limited statistical power. More conclusive evidence requires larger sample sizes than are currently available from the NHIS; power calculations suggest that 80% power to detect a five-percentage-point difference between lesbian/gay and bisexual women for outcomes with larger design effects²⁶ might require >20 times the sample size of a single year of NHIS (>100,000 women). To the best of our knowledge, only the English General Practice Patient Survey of U.K. residents (~1 million women annually) provides sample sizes large enough to detect small differences among sexual minority subgroups.²⁷ Until larger sample sizes are available, it may be useful to cautiously disaggregate sexual minority subgroups even when there is not strong evidence of heterogeneity among subgroups. Given growing evidence of unique barriers faced by bisexual women (including income differences seen here), programmatic and policy efforts should consider targeted strategies to meet the specific needs of subpopulations.

Limitations

Several limitations should be considered when interpreting these results. Sexual minority status may be underreported due to stigma, and barriers to care are self-reported and potentially subject to recall bias. In addition, NHIS data are cross-sectional and sample sizes are relatively small for some subgroups of SMW. This further underscores the need for sexual orientation questions to be included in large nationally representative surveys. Finally, despite efforts to better understand who identifies as “something else,” it is likely that this category includes significant heterogeneity in social experiences, stigma, and health-related issues. These limitations should be considered in light of our study’s many strengths, including its relatively large na-

tionally representative sample and detailed analysis of specific barriers to care faced by SMW.

Conclusion

Our findings suggest the need to identify ways to reduce health disparities between heterosexual and SMW and to increase efforts to educate practitioners about providing culturally competent care. More broadly, our study also highlights the need to continue collecting data on sexual orientation using large nationally representative surveys. We also present an approach for comparing the health and health care experiences of SMW and their heterosexual peers, pooled and disaggregated. We note that it is challenging to detect differences among sexual minority subgroups unless they are substantial, even with the large samples available in the NHIS. Our results also highlight the value of including and analyzing the “something else” category, particularly given fast-evolving sexual orientation terminology and its frequent use by younger sexual minority respondents.²⁸ Only in doing so can we more accurately characterize and address the pervasive health service barriers faced by specific subgroups of SMW and SMW collectively.

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Disclaimer

The views expressed in this article are those of the authors and do not necessarily reflect those of CMS or the U.S. Department of Health and Human Services.

Author Disclosure Statement

No competing financial interests exist.

Supplementary Material

Supplementary Table 1
Supplementary Table 2
Supplementary Table 3
Supplementary Table 4
Supplementary Table 5

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