

Sexual-Orientation Differences in Breast and Cervical Cancer Screening in Louisiana, 2014-2024

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Abstract

Purpose

To examine differences in up-to-date breast and cervical cancer screening between sexual minority (SM) and straight respondents in Louisiana and assess whether these differences varied across survey years and population characteristics.

Methods

We analyzed Louisiana Behavioral Risk Factor Surveillance System data from 2014, 2016, 2018, 2020, 2022, and 2024 among screening-eligible respondents classified as female in each annual dataset. Weighted descriptive analyses and log-binomial regression were used to estimate prevalence ratios (PRs) and 95% confidence intervals (CIs) comparing SM with straight respondents and to assess heterogeneity across demographic, healthcare-access, and temporal characteristics.

Results

The cervical screening sample included 7,151 respondents and the breast screening sample included 8,325 respondents. SM respondents were more likely than straight respondents to report never having undergone cervical screening (25.2% vs 11.1%; $P < 0.001$), while never having undergone breast screening did not differ by sexual orientation (5.4% vs 3.5%; $P = 0.284$). Sexual-orientation differences in up-to-date screening varied by age, race and ethnicity, educational attainment, personal healthcare provider status, and survey year for both outcomes, but not by insurance status. The largest breast-screening difference was among respondents without a personal healthcare provider (PR = 0.56; 95% CI, 0.51–0.61). Screening patterns also varied across survey years and differed between breast and cervical screening.

Conclusions

Sexual-orientation differences in cancer screening in Louisiana varied across population characteristics, survey years, and screening outcomes. State-level surveillance that examines these differences beyond overall screening estimates can provide more specific evidence to inform cancer-screening efforts for SM populations.

Introduction

Breast and cervical cancers continue to account for substantial cancer morbidity and mortality in the United States, despite the availability of established screening and early detection strategies [1]. Screening can reduce this burden through earlier detection of breast cancer and identification of

precancerous cervical changes before progression to invasive disease [2, 3]. However, the burden of these cancers is not equally distributed across populations. Louisiana experiences comparatively high mortality from both cancers, ranking fourth in the U.S. for female breast cancer mortality and seventh for cervical cancer mortality [4, 5].

National studies have documented differences in breast and cervical cancer screening by sexual orientation, with lower screening reported among sexual minority (SM) women compared with straight women [6–8]. Healthcare access, patient-provider communication and trust, and experiences of stigma and discrimination have also been associated with cancer screening among SM populations [9–12]. Sexual-orientation differences in cancer screening have varied across age, race and ethnicity, socioeconomic characteristics, and other population characteristics in national and multistate studies [8, 9, 13, 14]. Research examining sexual orientation jointly with race and ethnicity has further identified differences in cervical cancer screening across intersecting population groups [14].

This evidence is particularly relevant in Louisiana, where LGBTQ+ populations have already been identified as a priority for cancer-screening equity [15]. The Louisiana Comprehensive Cancer Control Plan reported lower breast cancer screening among LGBTQ+ adults than the statewide population in 2020 (65% vs 70%) and a larger difference in cervical cancer screening (55% vs 78%) [15]. The plan also established increasing breast and cervical cancer screening among LGBTQ+ populations as a health-equity objective [15]. These statewide estimates identify important screening differences but do not show how differences by sexual orientation are distributed across population characteristics or whether the same patterns are observed for breast and cervical cancer screening. Using data from 2014 through 2024, we examined differences in up-to-date breast and cervical cancer screening between SM and straight respondents in Louisiana and whether these differences varied across survey years. We also assessed variation in these associations by age, race and ethnicity, educational attainment, insurance status, and personal healthcare provider status.

Methods

Data and Sample

Data were obtained from the Louisiana Behavioral Risk Factor Surveillance System (BRFSS) for survey years 2014, 2016, 2018, 2020, 2022, and 2024 [16–21]. BRFSS is an annual, state-based telephone survey of noninstitutionalized U.S. adults that collects self-reported information on health behaviors, chronic conditions, healthcare access, and use of preventive services [22]. The six survey cycles were combined for analysis, using the corresponding sex and sexual orientation measures available in each year to account for changes in how these measures were collected and coded over the study period [16–21].

Analyses were restricted to respondents classified as female using the sex measure available in each survey year. BRFSS sex measures and their construction changed during the study period, so we used

the sex classification provided in each annual dataset rather than applying a single measure retrospectively across survey years [16–21]. Sexual orientation was categorized as straight or sexual minority. The SM category included respondents identifying as lesbian or gay, bisexual, or another non-straight sexual orientation based on the response categories available in each survey year [16–21]. Respondents who selected “don’t know/not sure,” refused to answer, or did not report sexual orientation were excluded (n = 203).

Separate analytic samples were constructed for breast and cervical cancer screening to reflect differences in screening eligibility and measures. Respondents with missing, unknown, or refused information required to determine screening status were excluded from the respective analytic sample (cervical cancer screening, n = 4,519; breast cancer screening, n = 648). Respondents reporting a history of hysterectomy were also excluded from the cervical cancer screening sample.

Measures

The primary outcomes were up-to-date breast and cervical cancer screening. Breast cancer screening was assessed among respondents aged 50 to 74 years, consistent with the U.S. Preventive Services Task Force (USPSTF) recommendation in effect for most of the study period. In 2024, the USPSTF expanded its recommendation for biennial mammography to ages 40 to 74 years [23]. Respondents were classified as up to date if they reported a mammogram within the previous 2 years [16–21].

Cervical cancer screening was assessed among respondents aged 21 to 65 years with no reported history of hysterectomy [24]. In 2014, respondents were classified as up to date if they reported a Pap test within the previous 3 years, and although HPV testing was included in an optional BRFSS module that year, the HPV testing module was not administered in Louisiana [25]. From 2016 through 2020, respondents aged 21 to 29 years were classified as up to date based on Pap testing within the previous 3 years, and those aged 30 to 65 years based on Pap testing within the previous 3 years or HPV testing within the previous 5 years [17–19, 24]. BRFSS revised its cervical cancer screening questions beginning in 2022 [26]. For 2022 and 2024, screening status was constructed from reported screening history, timing of the most recent screening, and whether the most recent screening included a Pap or HPV test, applying the same age-specific screening intervals [20, 21, 24].

Sociodemographic and healthcare-access covariates were selected based on their relevance to cancer screening and availability across survey years. These included age, race and ethnicity, educational attainment, health insurance status, personal healthcare provider status, and survey year. Age was categorized as 21 to 25, 26 to 35, 36 to 45, 46 to 55, and 56 to 65 years for cervical cancer screening and 50 to 54, 55 to 64, and 65 to 74 years for breast cancer screening. Race and ethnicity were categorized as non-Hispanic White, non-Hispanic Black, or other race or ethnicity; and educational attainment as less than high school, high school graduate, some college or technical school, or college graduate. Respondents were classified as insured if they reported having any form of health care coverage and uninsured if they reported no coverage. Personal healthcare provider status was based on whether

respondents reported having one or more people they considered their personal doctor or healthcare provider and was categorized as one or more providers versus none.

Statistical Analysis

Descriptive statistics were used to characterize the breast and cervical cancer screening analytic samples by sexual orientation. Differences in participant characteristics and up-to-date screening status between straight and SM respondents were examined using survey-weighted chi-square tests.

Prevalence ratios (PRs) and 95% confidence intervals (CIs) were estimated to compare up-to-date screening between SM and straight respondents, with straight respondents serving as the reference group. PRs were used rather than odds ratios because the screening outcomes were common [27]. To assess variation in sexual-orientation differences across population characteristics, PRs were estimated within strata of age, race and ethnicity, educational attainment, health insurance status, personal healthcare provider status, and survey year using log-binomial regression. Given the small number of SM respondents within several subgroups, models included a limited set of adjustment variables. Breast cancer screening estimates were adjusted for survey year, and cervical cancer screening estimates were adjusted for age and survey year, except when the adjustment variable was itself the stratifying characteristic. Heterogeneity across strata was assessed using interaction terms between sexual orientation and each stratifying characteristic in pooled log-binomial models.

Analyses accounted for the complex survey design of BRFSS [22]. For the combined survey cycles, year-specific sampling weights were constructed by multiplying the BRFSS final sampling weight by the proportion assigned to each survey year in the pooled analysis. Analyses incorporated the resulting sampling weights, BRFSS strata, and primary sampling units. Analyses were conducted using SAS version 9.4 (SAS Institute Inc., Cary, NC).

Results

Participant characteristics

Table 1 presents characteristics of the analytic samples by sexual orientation. The cervical cancer screening sample included 7,151 individuals (weighted n = 859,467), and the breast cancer screening sample included 8,325 individuals (weighted n = 634,660).

In the cervical cancer screening sample, 7.4% identified as SM and 92.6% as straight (Table 1). SM respondents were younger, with 85.8% aged ≤ 45 years compared with 62.6% of straight respondents, and were less likely to report having a personal healthcare provider (72.8% vs 81.1%; $P = 0.001$). Insurance coverage was similar between groups (86.4% vs 86.5%; $P = 0.969$). Racial and ethnic distribution differed by sexual orientation ($P = 0.007$), including a higher proportion categorized as other race and ethnicity among SM respondents (14.4% vs 9.2%) and a lower proportion who were non-

Hispanic Black (28.2% vs 34.8%). Educational attainment also differed ($P = 0.017$), with a greater proportion of SM respondents reporting high school as their highest level of education (37.1% vs 27.8%).

Table 1
Characteristics of Cervical Cancer Screening-Eligible Study Participants by Sexual Orientation

Characteristic	Overall		Sexual Minority		Straight		P-value
	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	
Total	7,151 / 859,467	100.0	429 / 63,224	7.4 (6.5, 8.2)	6,722 / 796,243	92.6 (91.8, 93.5)	
Age group							< 0.001
21–25 years	558 / 117,234	13.6 (12.4, 14.9)	93 / 18,105	28.6 (23.0, 34.3)	465 / 99,129	12.4 (11.2, 13.7)	
26–35 years	1,439 / 236,576	27.5 (26.1, 29.0)	138 / 24,886	39.4 (33.5, 45.2)	1,301 / 211,690	26.6 (25.1, 28.1)	
36–45 years	1,588 / 198,986	23.2 (21.9, 24.4)	92 / 11,252	17.8 (13.8, 21.8)	1,496 / 187,734	23.6 (22.3, 24.9)	
46–55 years	1,732 / 161,472	18.8 (17.8, 19.8)	60 / 5,922	9.4 (6.6, 12.2)	1,672 / 155,550	19.5 (18.4, 20.6)	
56–65 years	1,834 / 145,198	16.9 (16.0, 17.8)	46 / 3,059	4.8 (3.1, 6.6)	1,788 / 142,139	17.9 (16.8, 18.9)	
Race and ethnicity							0.007
Non-Hispanic Black	2,130 / 294,499	34.3 (32.9, 35.8)	104 / 17,809	28.2 (22.6, 33.7)	2,026 / 276,691	34.8 (33.3, 36.4)	
Non-Hispanic White	4,418 / 481,000	56.1 (54.6, 57.6)	270 / 36,263	57.4 (51.5, 63.3)	4,148 / 444,737	56.0 (54.4, 57.5)	
Other	591 / 82,268	9.6 (8.6, 10.6)	54 / 9,110	14.4 (10.1, 18.8)	537 / 73,158	9.2 (8.2, 10.2)	
Education							0.017
Abbreviations: SM, sexual minority; CI, confidence interval. Percentages are weighted to account for the complex survey design. P values were calculated using survey-weighted chi-square tests comparing straight and SM respondents.							

Characteristic	Overall		Sexual Minority		Straight		P-value
	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	
Under high school	489 / 100,992	11.8 (10.6, 13.0)	24 / 6,356	10.1 (5.7, 14.4)	465 / 94,635	11.9 (10.6, 13.2)	
High school graduate	1,811 / 244,686	28.5 (27.1, 29.9)	122 / 23,456	37.1 (31.2, 43.0)	1,689 / 221,230	27.8 (26.4, 29.2)	
Some college	1,923 / 273,236	31.8 (30.4, 33.2)	109 / 17,622	27.9 (22.7, 33.0)	1,814 / 255,614	32.1 (30.6, 33.6)	
College graduate	2,921 / 239,905	27.9 (26.8, 29.1)	174 / 15,789	25.0 (20.8, 29.2)	2,747 / 224,116	28.2 (27.0, 29.4)	
Insurance							0.969
Yes	6,263 / 736,057	86.5 (85.4, 87.6)	372 / 53,355	86.4 (81.9, 91.0)	5,891 / 682,702	86.5 (85.4, 87.7)	
No	821 / 114,560	13.5 (12.4, 14.6)	46 / 8,366	13.6 (9.0, 18.1)	775 / 106,195	13.5 (12.3, 14.6)	
Personal healthcare provider							0.001
Yes	5,920 / 688,217	80.5 (79.2, 81.8)	327 / 45,407	72.8 (67.3, 78.3)	5,593 / 642,810	81.1 (79.8, 82.4)	
No	1,200 / 166,653	19.5 (18.2, 20.8)	98 / 16,975	27.2 (21.7, 32.7)	1,102 / 149,679	18.9 (17.6, 20.2)	
Survey year							< 0.001
2014	1,724 / 191,904	22.3 (21.3, 23.4)	51 / 6,861	10.9 (7.3, 14.4)	1,673 / 185,043	23.2 (22.1, 24.4)	
2016	1,114 / 137,095	16.0 (14.7, 17.2)	35 / 5,952	9.4 (5.1, 13.7)	1,079 / 131,143	16.5 (15.2, 17.8)	
Abbreviations: SM, sexual minority; CI, confidence interval. Percentages are weighted to account for the complex survey design. P values were calculated using survey-weighted chi-square tests comparing straight and SM respondents.							

Characteristic	Overall		Sexual Minority		Straight		P-value
	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	
2018	1,183 / 134,963	15.7 (14.7, 16.7)	72 / 9,819	15.5 (11.6, 19.5)	1,111 / 125,144	15.7 (14.6, 16.8)	
2020	995 / 127,747	14.9 (13.8, 15.9)	68 / 9,937	15.7 (11.6, 19.9)	927 / 117,811	14.8 (13.7, 15.9)	
2022	1,142 / 146,717	17.1 (16.2, 18.0)	113 / 18,185	28.8 (23.5, 34.1)	1,029 / 128,532	16.1 (15.2, 17.1)	
2024	993 / 121,040	14.1 (13.3, 14.9)	90 / 12,470	19.7 (15.4, 24.0)	903 / 108,570	13.6 (12.8, 14.4)	
Abbreviations: SM, sexual minority; CI, confidence interval. Percentages are weighted to account for the complex survey design. P values were calculated using survey-weighted chi-square tests comparing straight and SM respondents.							

In the breast cancer screening sample, 2.5% identified as SM and 97.5% as straight (Table 2). Age distribution was similar by sexual orientation (P = 0.389), as were race and ethnicity (P = 0.325), educational attainment (P = 0.504), insurance coverage (P = 0.503), and personal healthcare provider status (P = 0.926).

Table 2
Characteristics of Breast Cancer Screening-Eligible Study Participants by Sexual Orientation

Characteristic	Overall		Sexual Minority		Straight		P-value
	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	
Total	8,325 / 634,660	100.0	197 / 15,572	2.5 (2.0, 2.9)	8,128 / 619,088	97.5 (97.1, 98.0)	
Age group							0.389
50–54 years	1,536 / 147,587	23.9 (22.7, 25.2)	43 / 4,512	29.5 (19.1, 39.9)	1,493 / 143,075	23.8 (22.6, 25.1)	
55–64 years	3,433 / 273,918	44.4 (43.0, 45.8)	86 / 6,615	43.2 (33.7, 52.6)	3,347 / 267,303	44.5 (43.1, 45.9)	
65–74 years	3,069 / 194,824	31.6 (30.4, 32.8)	64 / 4,191	27.4 (19.7, 35.0)	3,005 / 190,632	31.7 (30.5, 33.0)	
Race and ethnicity							0.325
Non-Hispanic Black	2,103 / 183,669	29.0 (27.7, 30.3)	48 / 5,449	35.1 (24.5, 45.7)	2,055 / 178,220	28.9 (27.6, 30.2)	
Non-Hispanic White	5,752 / 414,603	65.5 (64.2, 66.8)	136 / 9,091	58.5 (48.3, 68.8)	5,616 / 405,512	65.7 (64.3, 67.0)	
Other	446 / 34,731	5.5 (4.8, 6.2)	12 / 988	6.4 (2.4, 10.4)	434 / 33,742	5.5 (4.8, 6.2)	
Education							0.504
Under high school	700 / 84,358	13.3 (12.2, 14.5)	16 / 2,617	16.8 (6.4, 27.2)	684 / 81,740	13.2 (12.1, 14.4)	
High school graduate	2,593 / 212,467	33.6 (32.3, 34.9)	63 / 5,097	32.7 (23.9, 41.6)	2,530 / 207,369	33.6 (32.3, 34.9)	
Some college	2,250 / 192,002	30.3 (29.1, 31.6)	45 / 3,803	24.4 (16.9, 31.9)	2,205 / 188,199	30.5 (29.2, 31.8)	
Abbreviations: SM, sexual minority; CI, confidence interval. Percentages are weighted to account for the complex survey design. P values were calculated using survey-weighted chi-square tests comparing straight and SM respondents.							

Characteristic	Overall		Sexual Minority		Straight		P-value
	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	n / Weighted n	Weighted % (95% CI)	
College graduate	2,768 / 144,243	22.8 (21.8, 23.8)	73 / 4,054	26.0 (19.2, 32.9)	2,695 / 140,189	22.7 (21.7, 23.7)	
Insurance							0.503
Yes	7,769 / 584,336	93.4 (92.6, 94.1)	184 / 14,594	94.6 (91.2, 98.0)	7,585 / 569,741	93.3 (92.6, 94.1)	
No	460 / 41,494	6.6 (5.9, 7.4)	11 / 826	5.4 (2.0, 8.8)	449 / 40,668	6.7 (5.9, 7.4)	
Personal healthcare provider							0.926
Yes	7,688 / 584,116	92.4 (91.7, 93.2)	181 / 14,379	92.6 (88.3, 96.9)	7,507 / 569,737	92.4 (91.6, 93.2)	
No	608 / 47,884	7.6 (6.8, 8.3)	15 / 1,144	7.4 (3.1, 11.7)	593 / 46,740	7.6 (6.8, 8.4)	
Survey year							0.001
2014	1,972 / 133,683	21.1 (20.1, 22.0)	25 / 1,547	9.9 (5.7, 14.2)	1,947 / 132,136	21.3 (20.4, 22.3)	
2016	1,603 / 97,403	15.3 (14.4, 16.3)	27 / 1,245	8.0 (4.0, 12.0)	1,576 / 96,157	15.5 (14.6, 16.5)	
2018	1,188 / 97,260	15.3 (14.3, 16.3)	32 / 2,878	18.5 (11.3, 25.7)	1,156 / 94,382	15.2 (14.2, 16.3)	
2020	1,194 / 103,700	16.3 (15.3, 17.3)	36 / 2,963	19.0 (11.7, 26.3)	1,158 / 100,738	16.3 (15.3, 17.3)	
2022	1,264 / 110,427	17.4 (16.5, 18.3)	41 / 4,019	25.8 (15.7, 35.9)	1,223 / 106,408	17.2 (16.3, 18.1)	
2024	1,104 / 92,186	14.5 (13.8, 15.3)	36 / 2,919	18.7 (12.3, 25.2)	1,068 / 89,267	14.4 (13.7, 15.2)	
Abbreviations: SM, sexual minority; CI, confidence interval. Percentages are weighted to account for the complex survey design. P values were calculated using survey-weighted chi-square tests comparing straight and SM respondents.							

Overall, SM respondents had a higher prevalence of never having undergone cervical cancer screening than straight respondents (25.2% vs 11.1%; $P < 0.001$). In contrast, never having undergone breast cancer screening was uncommon and did not differ by sexual orientation (5.4% vs 3.5%; $P = 0.284$).

Trends in Up-to-Date Screening by Sexual Orientation

Up-to-date cervical and breast cancer screening varied by sexual orientation across survey years (Fig. 1A and Fig. 1B). Cervical screening among straight respondents was 84.5% in 2014, 81.3% in 2016, 85.9% in 2018, and 81.6% in 2020, before declining to 53.0% in 2022 and increasing to 69.0% in 2024. Among SM respondents, screening increased from 67.4% in 2014 to 90.8% in 2016, followed by 81.1% in 2018, 57.8% in 2020, 45.8% in 2022, and 70.5% in 2024. Screening was higher among straight respondents in most survey years, except 2016 and 2024.

Breast cancer screening among straight respondents remained relatively stable across survey years, ranging from 78.5% to 82.7% (Fig. 1B). Among SM respondents, prevalence varied more widely, from 52.2% in 2016 to 90.5% in 2018, with estimates of 79.6% in 2014, 83.6% in 2020, 79.0% in 2022, and 65.7% in 2024.

Stratified Prevalence Ratios for Cervical Cancer Screening

Figure 2A shows that cervical screening differences between SM and straight respondents were not consistent across population groups. The largest differences were among respondents with less than a high school education (PR = 0.72; 95% CI, 0.70–0.74) and those aged 56–65 years (PR = 0.77; 95% CI, 0.74–0.79). Differences also varied across survey years, with PRs ranging from 0.70 (95% CI, 0.69–0.72) in 2020 to 1.08 (95% CI, 1.08–1.09) in 2016. There was evidence of heterogeneity by age, race and ethnicity, educational attainment, personal healthcare provider status, and survey year, but not by insurance status (P -homogeneity = 0.363).

Stratified Prevalence Ratios for Breast Cancer Screening

Figure 2B shows a more varied pattern for breast cancer screening. The largest SM-straight difference occurred among respondents without a personal healthcare provider (PR = 0.56; 95% CI, 0.51–0.61), whereas screening was similar by sexual orientation among respondents aged 50–54 years and non-Hispanic Black respondents (both PR = 1.00). Educational patterns also differed in direction, from lower screening among SM respondents with some college education (PR = 0.85; 95% CI, 0.84–0.87) to higher screening among those with less than a high school education (PR = 1.14; 95% CI, 1.12–1.16). Differences also shifted across survey years, from a PR of 0.67 (95% CI, 0.63–0.71) in 2016 to 1.11 (95% CI, 1.10–1.13) in 2018. Heterogeneity was observed across age, race and ethnicity, educational attainment, personal healthcare provider status, and survey year, but not insurance status (P -homogeneity = 0.139).

Discussion

This study found that sexual-orientation differences in breast and cervical cancer screening in Louisiana varied across survey years and population characteristics. Screening prevalence was generally lower among SM respondents than straight respondents, consistent with recent national studies reporting lower breast and cervical cancer screening among sexual minority populations [6–8]. The SM-straight association varied by age, race and ethnicity, educational attainment, personal healthcare provider status, and survey year for both screening outcomes, while there was no evidence of heterogeneity by insurance status. The groups with the largest differences were also not the same for breast and cervical screening.

Differences between SM and straight respondents changed across survey years, but the temporal patterns differed between the two screening outcomes. Cervical screening among straight respondents remained above 80% from 2014 through 2020 before declining in 2022 and increasing in 2024. Estimates among SM respondents varied more across the study period, with lower screening than straight respondents in most years, higher screening in 2016, and similar screening between groups in 2024. Breast screening among straight respondents remained relatively stable throughout the study period, while estimates among SM respondents ranged from 52.2% to 90.5%. National studies have also reported temporal variation in cervical screening by sexual orientation, including differences across sexual identities and racial and ethnic groups [8, 28]. However, the relatively small number of SM respondents, particularly in the breast screening sample, should be considered when interpreting individual survey-year estimates. The variation across years also shows the importance of continued surveillance, as estimates from a single survey year may not reflect screening patterns over time.

Changes in cervical screening practices and BRFSS measurement are particularly relevant to the cervical trends. HPV testing was incorporated into the Louisiana screening measure beginning in 2016, and BRFSS revised its cervical screening questions beginning in 2022 [16, 17, 26]. The higher cervical screening prevalence among SM respondents in 2016 coincided with the first survey year in this analysis that incorporated HPV testing. Whether HPV testing or reporting differed by sexual orientation cannot be determined from these data. The decline in cervical screening among both groups in 2022 also occurred during a period following substantial disruption to breast and cervical cancer screening associated with the COVID-19 pandemic [29, 30]. Because the pandemic period overlapped with changes in BRFSS cervical screening measurement, neither can be isolated as an explanation for the pattern we observed. Additional survey years using comparable measures will help determine whether the similar cervical screening prevalence among SM and straight respondents in 2024 continues.

The variation across subgroups was not consistent between breast and cervical screening, suggesting that sexual-orientation differences in screening may depend on both population characteristics and the screening outcome being examined. Previous studies have reported variation in cancer screening by sexual orientation across age, race and ethnicity, and socioeconomic characteristics [8, 9, 14]. Lin and colleagues identified differences in cervical screening across sexual orientation and racial and ethnic

groups, while Spencer and colleagues found that cervical screening differences varied across sexual identities and age groups [8, 14]. In Louisiana, the population groups with the largest SM-straight differences were not consistent across breast and cervical screening. An overall estimate of lower screening among SM respondents therefore does not describe the screening experience of every subgroup or necessarily identify the same populations for different cancer screening outcomes.

Never-screening further distinguished cervical from breast cancer screening. Approximately one quarter of SM respondents reported never having undergone cervical screening, compared with 11.1% of straight respondents. By comparison, never having undergone breast screening was uncommon and did not differ by sexual orientation. Lower cervical screening among lesbian and bisexual populations has been reported across national studies, and screening prevalence can differ across sexual minority identities [7, 8]. The cervical findings therefore extend beyond differences in whether respondents were currently up to date and include a substantial difference in the proportion reporting no previous screening. Future research should distinguish factors associated with never initiating cervical screening from those associated with becoming overdue after previous screening. Understanding why some SM populations never initiate cervical screening is particularly important because the factors preventing someone from being screened for the first time may differ from those that lead someone with prior screening to become overdue.

Healthcare access also differed depending on how it was measured. Insurance coverage was nearly identical among SM and straight respondents in the cervical sample and did not differ between groups in the breast sample. There was also no evidence that the SM-straight association varied by insurance status for either screening outcome. Personal healthcare provider status, however, distinguished the association for both outcomes, with the largest breast-screening difference observed among respondents with no personal healthcare provider. Recent national research found that measured socioeconomic and healthcare-access characteristics, particularly insurance, accounted for part of the overall cervical screening difference by sexual orientation [6]. In Louisiana, however, the SM-straight difference in screening did not vary between insured and uninsured respondents for either screening outcome. This suggests that insurance coverage alone may not adequately identify differences in healthcare access related to screening among SM populations.

Personal healthcare provider status should be interpreted as an indicator of healthcare access rather than a measure of who provided or recommended cancer screening. The BRFSS measure does not identify whether respondents received preventive care from an obstetrician-gynecologist or another clinician, nor does it identify which provider, if any, discussed or recommended breast or cervical cancer screening. The difference between the insurance and personal healthcare provider findings indicates that the two access measures showed different patterns. Prior research has identified patient-provider relationships, communication, stigma and discrimination, and perceived medical heterosexism as factors associated with cancer screening and preventive healthcare among SM populations [9–12]. Among SM women treated for breast cancer in the U.S. South, half had not disclosed their sexual orientation to their oncologist, with participants describing lack of clinician inquiry and concerns about

stigma or discrimination among barriers to disclosure [31]. Among African American SM women, physician recommendation has also been associated with breast cancer screening [32]. The observed heterogeneity by personal healthcare provider status should not be interpreted as evidence that provider behavior caused the screening differences. Future research should examine the types and continuity of healthcare relationships through which SM patients receive preventive care, as well as screening recommendations, communication, sexual-orientation disclosure, experiences of stigma, and culturally affirming care. These are important areas for direct assessment because BRFSS can identify differences associated with healthcare access but cannot determine which healthcare experiences or screening practices contribute to them.

Lesbian, gay, bisexual, and other non-straight respondents were combined in this analysis because the number of respondents within individual SM groups, particularly in the breast screening sample, was insufficient for reliable separate estimates. Previous studies have identified differences in breast and cervical screening across sexual minority identities [7, 8]. The combined SM estimates should therefore not be interpreted as a single screening pattern shared across sexual minority identities. Larger state samples or pooled data that retain identity-specific categories would allow these subgroup and temporal patterns to be examined separately and identify whether screening needs differ across sexual minority identities.

The Louisiana Comprehensive Cancer Control Plan 2022–2027 includes a health-equity objective to increase cancer screening among people who identify as LGBTQ+ [15]. Monitoring screening by sexual orientation alongside age, race and ethnicity, education, and healthcare-access characteristics may provide more specific information about where differences remain and whether they change over time. Continued collection of sexual orientation data is also necessary to identify and monitor screening differences that would otherwise be combined within overall population estimates [33]. Further research on healthcare access and screening experiences among SM populations can help identify barriers and care processes that may be appropriate targets for future screening efforts.

Strengths and Limitations

This study has several strengths, including the use of six cycles of population-based Louisiana surveillance data spanning 2014 through 2024 and examination of both breast and cervical cancer screening. Stratified analyses and formal tests of heterogeneity allowed the SM-straight association to be examined across demographic, socioeconomic, healthcare-access, and temporal characteristics rather than relying only on an overall comparison. Examining both screening outcomes also showed that the characteristics distinguishing SM-straight differences were not consistent between breast and cervical screening.

Several limitations should be considered. BRFSS measures are self-reported and may be subject to recall bias. Screening recommendations and BRFSS cervical screening measures changed during the study period, particularly with the incorporation of HPV testing and revision of cervical screening questions,

complicating interpretation of temporal trends. The screening measures also did not distinguish routine cervical screening from testing following a previous abnormal result. Sex measures and their construction changed across survey years, so respondents were classified as female using the measure available in each survey year rather than a consistent measure of sex assigned at birth or gender identity. The SM category combined respondents identifying as lesbian or gay, bisexual, or another non-straight sexual orientation, preventing assessment of differences among these groups. The relatively small number of SM respondents, particularly in the breast screening sample, limited our ability to estimate identity-specific screening patterns and should be considered when interpreting subgroup and survey-year estimates. Respondents without sufficient information to determine screening status were excluded, which could introduce selection bias if missing information was related to sexual orientation or screening. Finally, healthcare-access measures were limited to health insurance and personal healthcare provider status and did not measure other dimensions of healthcare access and experience.

Conclusion

Sexual-orientation differences in breast and cervical cancer screening in Louisiana varied across population groups and over time, with lower screening occurring among different groups for breast and cervical cancer. Personal healthcare provider status differentiated these associations, whereas insurance status did not. Continued state-level surveillance, larger samples that preserve sexual minority identities, and research examining healthcare access and screening experiences beyond those measured in BRFSS can provide more specific evidence about the screening needs of SM populations. This evidence can help identify gaps in current screening practices and inform the development of screening guidance that better addresses the needs of SM populations.

Declarations

Competing Interests

The authors have no relevant financial or non-financial interests to disclose.

Ethics Approval

This study used publicly available, de-identified data from the Behavioral Risk Factor Surveillance System (BRFSS).

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Author Contribution

B.R.E. led the study conception and design and contributed to the methodology and analysis. Y.Z. contributed to the methodology and analysis. T.C.J. led manuscript drafting and contributed to interpretation of the findings. All authors contributed to interpretation of the findings, critically reviewed and revised the manuscript, and read and approved the final manuscript. T.C.J. is the corresponding author.

Data Availability

The data analyzed in this study are publicly available from the Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System annual data repository.

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Figures

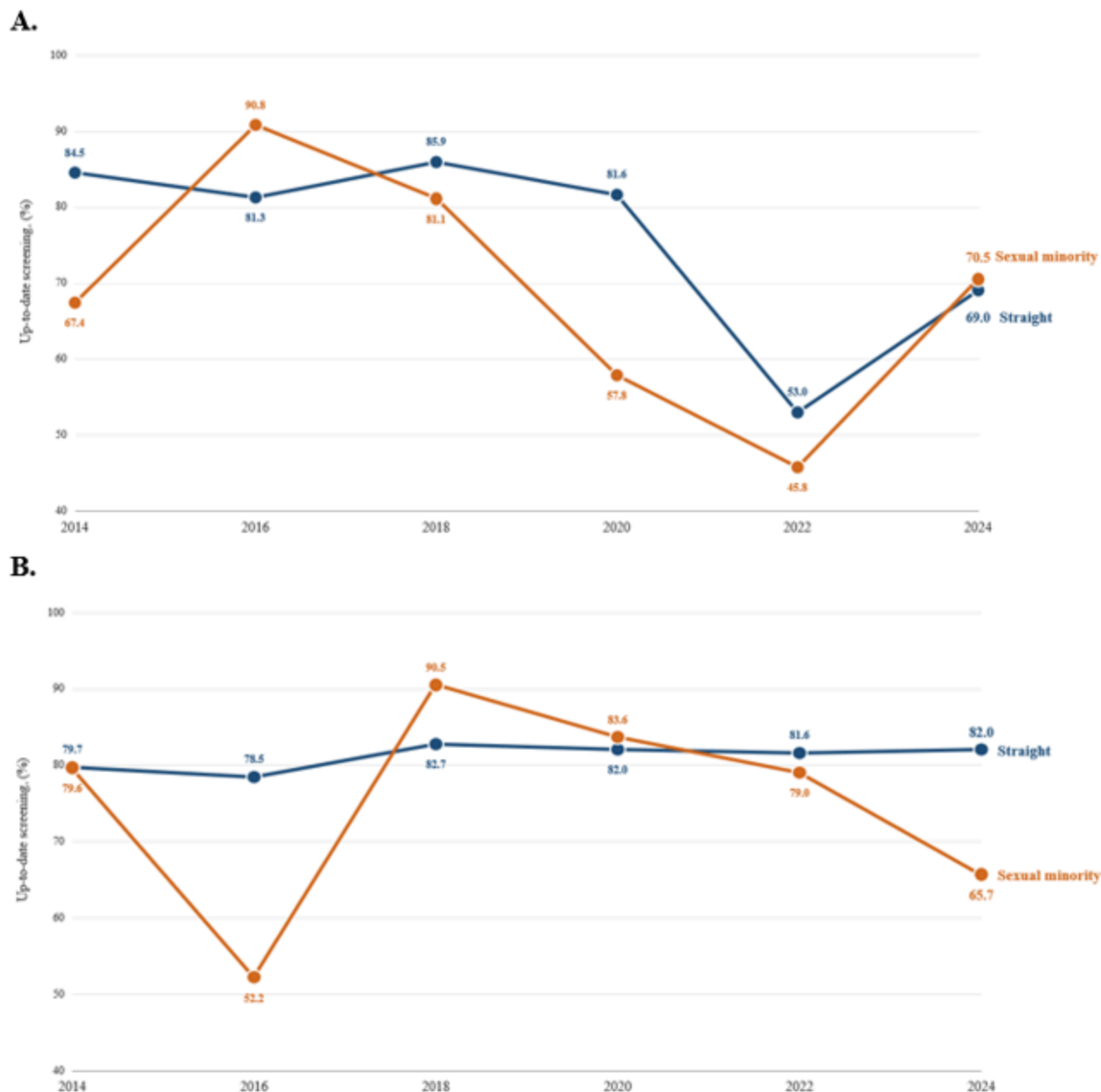


Figure 1

Trends in up-to-date cancer screening by sexual orientation in Louisiana, 2014–2024. (A) Cervical cancer screening. (B) Breast cancer screening. Estimates account for the complex survey design of the Behavioral Risk Factor Surveillance System (BRFSS)

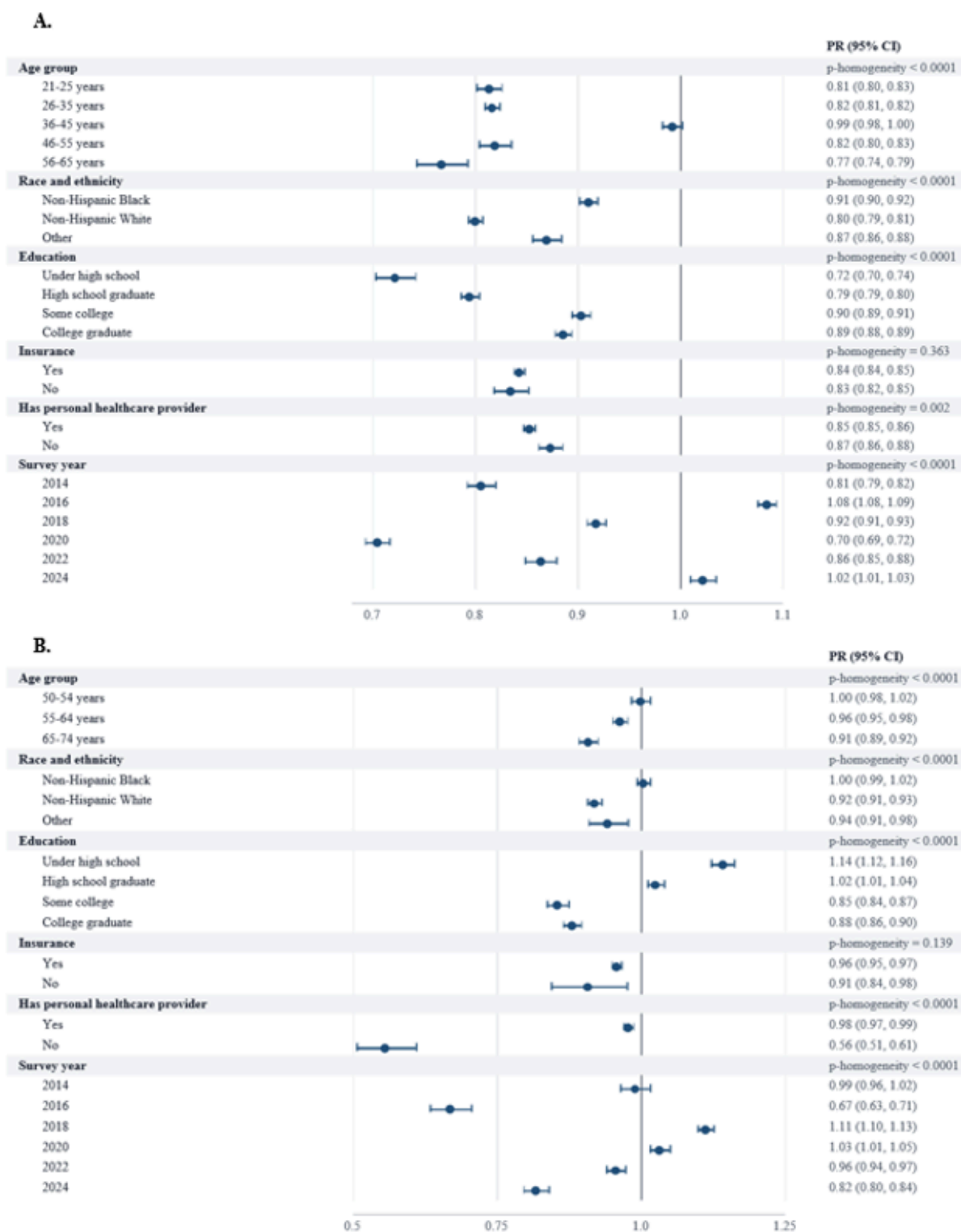


Figure 2

Stratified prevalence ratios for up-to-date cancer screening among sexual minority compared with straight respondents in Louisiana, 2014–2024. (A) Cervical cancer screening. (B) Breast cancer screening. Straight respondents served as the reference group. Points represent prevalence ratios (PRs), and horizontal lines represent 95% confidence intervals (CIs). P values for heterogeneity assess variation in the association between sexual orientation and screening across levels of each stratifying

characteristic. Breast cancer estimates were adjusted for survey year; cervical cancer estimates were adjusted for age and survey year, except when the adjustment variable was the stratifying characteristic