Chronic Health Conditions and Key Health Indicators Among Lesbian, Gay, and Bisexual Older US Adults, 2013–2014

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Objectives. To examine disparities in chronic conditions and health indicators among lesbian, gay, and bisexual (LGB) adults aged 50 years or older in the United States.

Methods. We used data from the 2013 and 2014 National Health Interview Survey to compare disparities in chronic conditions, health outcomes and behaviors, health care access, and preventive health care by sexual orientation and gender.

Results. LGB older adults were significantly more likely than heterosexual older adults to have a weakened immune system and low back or neck pain. In addition, sexual minority older women were more likely than their heterosexual counterparts to report having arthritis, asthma, a heart attack, a stroke, a higher number of chronic conditions, and poor general health. Sexual minority older men were more likely to report having angina pectoris or cancer. Rates of disability and mental distress were higher among LGB older adults.

Conclusions. At substantial cost to society, many disparities in chronic conditions, disability, and mental distress observed in younger LGB adults persist, whereas others, such as cardiovascular disease risks, present in later life. Interventions are needed to maximize LGB health. (Am J Public Health. 2017;107:1332–1338. doi:10.2105/AJPH.2017.303922)
cardiovascular disease or other chronic conditions among women, but gay and bisexual men showed elevated rates of diabetes and hypertension relative to heterosexual men. Using NHIS data, Gonzales and Henning-Smith found that older men and women in same-sex cohabiting partnerships were less likely than those in opposite-sex partnerships to report having a chronic condition.

Taken together, these sparse and divergent findings highlight the need to use nationally representative data to more fully investigate disparities in chronic conditions and other key health indicators among sexual minority older women (lesbians and bisexual women) and men (gay and bisexual men). The study described here, based on national data, is to our knowledge the first to examine the extent to which sexual orientation and gender are related to disparities in chronic health conditions, general health outcomes, health behaviors, health care access, and preventive health care specifically among adults aged 50 years or older in the United States. Our aim was to provide a more comprehensive understanding of the aging needs of the increasingly diverse older adult population.

METHODS

We derived our aggregated population-based data from the 2013 and 2014 versions of the NHIS, the largest in-person household health survey of the US noninstitutionalized population; we analyzed data from the sub-sample of adults aged 50 years or older. In 2013, for the first time, the survey assessed sexual orientation. Survey respondents were asked “Which of the following best represents how you think of yourself?” Response categories were as follows: gay or lesbian, straight (not gay or lesbian), bisexual, something else, and don’t know. We included in our study participants who self-identified as gay, lesbian, bisexual, or straight. Our sample comprised 18,669 heterosexual women, 14,141 heterosexual men, 197 lesbians, 229 gay men, 55 bisexual women, and 55 bisexual men. We applied pooled weights throughout our analyses to adjust for the unequal probabilities of sample selection arising from the study design and nonresponse.

Measures

**Chronic health conditions.** Participants were asked whether they had ever been told by a doctor or other health professional that they had had a stroke, a heart attack, angina pectoris, high blood pressure, chronic obstructive pulmonary disease, asthma, arthritis, low back or neck pain, diabetes, cancer, and weakened immune system. Obesity was defined as a body mass index of 30 kilograms per meter squared or greater. We computed numbers of chronic conditions by summing the conditions (other than weakened immune system, which was included only in 2013) reported by each participant.

**General health outcomes.** The NHIS assessed participants’ general health via self-evaluations. We dichotomized general health categories into good (good, very good, or excellent) and poor (fair or poor). Disability was measured through participants’ affirmative responses to any of the following items:

1. trouble with seeing, even when wearing glasses or contact lenses;
2. activity limitations attributable to hearing problems;
3. difficulty in walking up 10 steps without resting or walking a quarter of a mile without using any special equipment;
4. needing help with bathing or showering;
5. needing help in handling routine needs; or
6. being limited in any way because of difficulty remembering or experiencing periods of confusion.

Limitations in activities of daily living (ADLs) and instrumental ADLs (IADLs) were assessed by asking whether participants, because of a physical, mental, or emotional problem, needed help with personal care (e.g., eating, bathing, dressing) and routine needs (e.g., everyday household chores, shopping, doing necessary business), respectively. Mental distress was measured via the 6-item Psychological Distress Scale (α = 0.87); a summed score greater than 6 was coded as reflecting mental distress.

**Health behaviors, health care access, and preventive health care.** Among those who had smoked 100 or more cigarettes, current and former smokers were distinguished by whether or not they currently smoked. Excessive drinking was defined as women having 4 or more and men having 5 or more drinks on a single occasion during the preceding month. Former drinkers were categorized as those who had consumed at least 12 drinks during their lifetime but no drinks in the preceding year. Physical activity was defined according to a combined duration of moderate and vigorous activities of 150 minutes or more per week as recommended by the Centers for Disease Control and Prevention. Those who reported experiencing any of 4 types of sleep problems (trouble falling asleep, trouble staying asleep, taking sleep aid medication, and not waking up feeling well rested in the past week) 3 times or more a week were categorized as having sleep problems.

We assessed health care access according to whether participants had health insurance coverage and a primary source of care (a place to go when they were sick or needed advice about health). Preventive health care was assessed according to whether participants had had a blood pressure screening, flu shot, or mammogram (among women aged 50–70 years) in the preceding 12 months and whether they had ever had an HIV test.

**Sociodemographic characteristics.** The sociodemographic characteristics assessed included age in years, race/ethnicity (non-Hispanic White vs other), household income (200% or below vs more than 200% above the federal poverty level), employment status (employed vs not employed), educational attainment (high school or less vs at least some college), relationship status, and living arrangement (living alone vs living with someone). Relationship status was categorized as married, partnered (living with a partner), or single (widowed, divorced, separated, or never married).

Statistical Analysis

We used Stata version 14.0 in conducting our analyses. All analyses were conducted separately by gender. Sexual orientation was dichotomized into sexual minority (lesbian, gay, bisexual) or heterosexual, with heterosexuals treated as the reference group.

First, we used the adjusted Wald test to compare estimates of sociodemographic characteristics according to sexual orientation. Second, we estimated prevalence rates for health indicators by sexual orientation.
We conducted a series of logistic and linear regressions as appropriate, controlling for socioeconomic covariates (age, race/ethnicity, income, and education) that have been found to be associated with health disparities,\textsuperscript{23,24} to test associations between sexual orientation and chronic health conditions and other health indicators. Also, we assessed the statistical significance of differences in sociodemographic characteristics and key health indicators between sexual minority subgroups (lesbians vs bisexual women and gay men vs bisexual men).

We applied balanced repeated replications methodology to calculate standard errors.\textsuperscript{25} This method incorporates the specific complex sampling designs of the NHIS, with each sampling stratum having exactly 2 sampling units. We used the Survey package in R\textsuperscript{26} to derive a 308 x 308 Hadamard matrix and used the first 300 entries in computing balanced repeated replication weights.

**RESULTS**

In comparison with heterosexual older women, sexual minority older women were younger and had higher household incomes, educational attainment levels, and employment rates, whereas the racial/ethnic backgrounds of the 2 groups were comparable (Table 1). Sexual minority older women were less likely than heterosexual older women to be married, more likely to be partnered, and equally likely to be single. There were no significant differences in number of children in the household or likelihood of living alone. Subgroup comparisons revealed that bisexual women had lower incomes than lesbians, were more likely to be married, and were less likely to be partnered.

In comparison with heterosexual older men, sexual minority older men were significantly younger and had higher educational levels; however, there were no differences in income or employment status. Sexual minority older men were more likely than heterosexual older men to be non-Hispanic White, less likely to be married, more likely to be partnered, and more likely to be single. In addition, they were more likely to live alone and had fewer children in the household. According to subgroup comparisons, bisexual older men were older and less likely to be employed than gay older men; although members of the 2 groups were equally likely to be married, bisexual older men were less likely to be partnered, and they had more children in the household.

**Chronic Health Conditions**

Table 2 presents data on the prevalence of chronic health conditions according to sexual orientation and gender and the results of significance tests after control for demographic characteristics. Sexual minority older women were more likely than heterosexual older women to have experienced a stroke, a heart attack, asthma, arthritis, low back or neck pain, and a weakened immune system but were less likely to have diabetes. Sexual minority older women had a significantly higher number of chronic conditions than heterosexual older women. Among sexual minority older women, lesbians were more likely than bisexual women to report having had a stroke (adjusted odds ratio [OR] = 2.79; \( P < .05 \)), a heart attack (adjusted OR = 4.47; \( P < .01 \)), or arthritis (adjusted OR = 3.15; \( P < .001 \)). Sexual minority older men were more likely than heterosexual older men to report angina pectoris, low back or neck pain, cancer, and a weakened immune system; they were less likely to be obese. The likelihood of a weakened immune system (adjusted OR = 10.25; \( P < .001 \)) and obesity (adjusted OR = 2.77; \( P < .001 \)) was higher among gay older men than among bisexual older men, whereas bisexual older men were more likely to have low back or neck pain (adjusted OR = 1.57; \( P < .05 \)).

**General Health Outcomes**

As shown in Table 3, after adjustment for demographic characteristics, sexual minority older women were more likely than heterosexual older women to have insurance coverage; there were no significant differences in having a usual source of medical care (Table 4). In terms of preventive care, adjusted analyses showed that sexual minority older women were more likely to have had a blood pressure screening and HIV test than were heterosexual older women.

Older men were comparable with respect to health care access across sexual orientation groups. Sexual minority older men were more likely than heterosexual older men to have had a flu shot and an HIV test during the preceding year. Subgroup comparisons showed that gay men were more likely than bisexual men to have had an HIV test (adjusted OR = 1.70; \( P < .05 \)).

**Health Behaviors**

Table 4 shows that, after control for demographic characteristics, sexual minority older women were more likely to engage in excessive drinking than heterosexual older women and were more likely to be former drinkers and smokers. Also, sexual minority older women were more likely than heterosexual older women to experience sleep problems. Rates of physical activity did not differ according to sexual orientation. Subgroup comparisons showed that lesbians were more likely than bisexual women to be former drinkers (adjusted OR = 2.66; \( P < .001 \)). In comparison with heterosexual older men, sexual minority older men were more likely to be current smokers and to engage in excessive drinking. Physical activity and sleep problems were not associated with sexual orientation among older men. Subgroup comparisons revealed that bisexual men were more likely than gay men to be current smokers (adjusted OR = 2.13; \( P < .01 \)).

**Health Care Access and Preventive Health Care**

After adjustment for demographic characteristics, sexual minority older women were more likely than heterosexual older women to have health insurance coverage; there were no significant differences in having a usual source of care (Table 4). In terms of preventive care, adjusted analyses showed that sexual minority older women were more likely to have had a blood pressure screening and HIV test than were heterosexual older women.

Older men were comparable with respect to health care access across sexual orientation groups. Sexual minority older men were more likely than heterosexual older men to have had a flu shot and an HIV test during the preceding year. Subgroup comparisons showed that gay men were more likely than bisexual men to have had an HIV test (adjusted OR = 1.70; \( P < .05 \)).
Sociodemographic Characteristics Among Women and Men Aged 50 Years or Older, by Sexual Orientation: National Health Interview Survey, United States, 2013–2014

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Heterosexual Women (n = 18,669), Mean or % (95% CI)</th>
<th>Lesbian/Bisexual Women (n = 252), Mean or % (95% CI)</th>
<th>Gay/Bisexual Men (n = 14,114), Mean or % (95% CI)</th>
<th>Heterosexual Men (n = 284), Mean or % (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>64.4 (64.3, 64.5)</td>
<td>74.0 (73.6, 74.5)</td>
<td>70.8 (70.6, 70.9)</td>
<td>74.0 (73.6, 74.5)</td>
</tr>
<tr>
<td>Non-Hispanic White race/ethnicity</td>
<td>58.6*** (58.0, 59.3)</td>
<td>75.0 (70.8, 78.8)</td>
<td>75.0*** (80.9, 85.3)</td>
<td>83.2*** (82.0, 84.6)</td>
</tr>
<tr>
<td>Income ≤200% of poverty level</td>
<td>30.8 (30.2, 31.4)</td>
<td>21.6 (17.9, 25.7)</td>
<td>26.1*** (21.9, 29.6)</td>
<td>23.3 (19.7, 27.4)</td>
</tr>
<tr>
<td>Employed</td>
<td>40.1 (39.6, 40.6)</td>
<td>59.7 (50.5, 68.3)</td>
<td>50.4 (49.9, 51.0)</td>
<td>49.4 (44.7, 54.1)</td>
</tr>
<tr>
<td>High school education or less</td>
<td>44.1 (43.6, 44.6)</td>
<td>22.6 (16.2, 30.5)</td>
<td>41.1 (40.7, 41.9)</td>
<td>25.6*** (21.9, 29.6)</td>
</tr>
<tr>
<td>No. of children in household</td>
<td>0.2 (0.2, 0.2)</td>
<td>0.2 (0.1, 0.2)</td>
<td>0.2 (0.1, 0.2)</td>
<td>0.1* (0.1, 0.2)</td>
</tr>
<tr>
<td>Lives alone</td>
<td>27.3 (26.9, 27.8)</td>
<td>24.7 (21.5, 28.2)</td>
<td>23.9 (20.3, 27.9)</td>
<td>28.3 (21.7, 36.0)</td>
</tr>
</tbody>
</table>

Note. CI = confidence interval. Wald tests were used to compare demographic characteristics between heterosexuals and lesbian, gay, and bisexual participants as well as between lesbians/gays and bisexuals.

*P < .05; **P < .01; ***P < .001.

DISCUSSION

To our knowledge, this is the first national population-based study to comprehensively investigate disparities in chronic health conditions and other key health indicators among sexual minority older adults. In comparison with heterosexual older adults, sexual minority older adults exhibited a significantly higher likelihood of chronic health conditions and other disparities; however, they also showed some positive health indicators. As the population ages, the prevalence of chronic conditions increases, and these conditions represent some of the most common, costly, and preventable of all health problems. It is critical that groups at elevated risk for chronic health conditions be identified and targeted for prevention efforts, both to improve their health and well-being and to control health care expenditures.

Sexual minority older adults in this study were more likely than heterosexual older adults to experience low back or neck pain and weakened immune systems, which have not been examined in previous studies. These disparities, along with consistent findings of elevated distress and disability among sexual minority older adults and poor general health among sexual minority older women, particularly lesbians, likely reflect the substantial toll of marginalization and stigma across the life course. Chronic stressors can affect physical health over the life span through an accumulation of allostatic load, causing acceleration of aging. In studies of sexual and gender minority older adults, discrimination and victimization have been shown to be the strongest predictors of poor health outcomes.

Some of the disparities found with chronic health conditions may develop earlier in adulthood and persist into older age. Gonzales et al. observed this pattern for the higher likelihood of having multiple chronic conditions among lesbians and bisexual women aged 18 years or older. In addition, previous studies have consistently shown heightened risks of asthma and arthritis among sexual minority women and cancer among sexual minority men. Other disparities documented in this study, including disparities in cardiovascular disease risks such as stroke and heart attack among sexual minority older women and angina pectoris among men, seem to first emerge in older adulthood. Interestingly, disparities in obesity, although well documented, were not significantly different by sexual orientation among women in this study. This finding could reflect a leveling effect, with rates of obesity among older heterosexual women reaching a level comparable to rates among sexual minority.
TABLE 2—Chronic Health Conditions Among Women and Men Aged 50 Years or Older, by Sexual Orientation: National Health Interview Survey, United States, 2013–2014

<table>
<thead>
<tr>
<th>Health Indicator</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Heterosexual (Ref), % (95% CI)</td>
<td>Lesbian/Bisexual, % (95% CI)</td>
</tr>
<tr>
<td>Chronic conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>5.1 (4.9, 5.3)</td>
<td>6.8 (5.2, 9.0)</td>
</tr>
<tr>
<td>Heart attack</td>
<td>4.3 (4.1, 4.4)</td>
<td>6.4 (4.5, 9.0)</td>
</tr>
<tr>
<td>Angina pectoris</td>
<td>3.0 (2.8, 3.1)</td>
<td>2.8 (1.9, 4.1)</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>50.0 (49.6, 50.5)</td>
<td>39.0 (35.1, 43.0)</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>6.0 (5.8, 6.2)</td>
<td>5.2 (4.0, 6.7)</td>
</tr>
<tr>
<td>Asthma</td>
<td>13.7 (13.4, 14.0)</td>
<td>18.0 (15.7, 20.5)</td>
</tr>
<tr>
<td>Arthritis</td>
<td>44.7 (44.2, 45.2)</td>
<td>50.3 (46.0, 54.6)</td>
</tr>
<tr>
<td>Low back/neck pain</td>
<td>39.8 (39.3, 40.3)</td>
<td>53.0 (48.4, 57.5)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>15.9 (15.6, 16.2)</td>
<td>10.6 (8.8, 12.7)</td>
</tr>
<tr>
<td>Obesity</td>
<td>30.6 (30.1, 31.1)</td>
<td>35.4 (31.4, 39.4)</td>
</tr>
<tr>
<td>Cancer</td>
<td>16.3 (15.9, 16.7)</td>
<td>14.6 (12.1, 17.6)</td>
</tr>
<tr>
<td>Weakened immune systemc</td>
<td>10.1 (9.6, 10.5)</td>
<td>17.2 (12.2, 23.7)</td>
</tr>
</tbody>
</table>

Note. CI = confidence interval; IRR = incidence risk ratio; OR = odds ratio. Significance tests adjusted for age, race/ethnicity, income, and education, and heterosexual women and men were coded as the reference groups.

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TABLE 3—General Health Outcomes Among Women and Men Aged 50 Years or Older, by Sexual Orientation: National Health Interview Survey, United States, 2013–2014

<table>
<thead>
<tr>
<th>Health Indicator</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Heterosexual (Ref), % (95% CI)</td>
<td>Lesbian/Bisexual, % (95% CI)</td>
</tr>
<tr>
<td>Poor general health</td>
<td>20.0 (19.6, 20.4)</td>
<td>25.0 (20.8, 29.6)</td>
</tr>
<tr>
<td>Disability</td>
<td>44.9 (44.4, 45.4)</td>
<td>44.9 (40.7, 49.2)</td>
</tr>
<tr>
<td>ADL limitations</td>
<td>4.9 (4.6, 5.1)</td>
<td>0.9 (0.5, 1.5)</td>
</tr>
<tr>
<td>IADL limitations</td>
<td>9.5 (9.2, 9.8)</td>
<td>7.4 (5.5, 9.9)</td>
</tr>
<tr>
<td>Mental distress</td>
<td>17.2 (16.8, 17.6)</td>
<td>21.6 (18.6, 25.0)</td>
</tr>
</tbody>
</table>

Note. ADL = activity of daily living; CI = confidence interval; IADL = instrumental activity of daily living; OR = odds ratio. Significance tests adjusted for age, race/ethnicity, income, and education, and heterosexual women and men were coded as the reference groups.

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women; it could also reflect selection bias resulting from premature mortality among those who are obese in younger adulthood. We found higher likelihoods of ADL and IADL limitations among gay and bisexual older men, which have not been previously documented in other studies of younger LGB adults. Such limitations may be associated with higher rates of disabling chronic conditions, such as cancer and angina pectoris, and likely require additional access to formal and informal caregiving. Yet, we found that sexual minority older men were more likely to live alone and less likely to have children in the household, which may result in an increased risk of social isolation in old age. Although sexual minority men had higher levels of education, this advantage did not lead to concomitant gains in resources such as income or employment. Sexual minority older women exhibited lower rates of diabetes and a lower risk of...
ADL limitations despite heightened risks in some chronic conditions, poor general health, and disability. It will be important in future research to examine how some protective factors, such as physical activity and socioeconomic resources, among sexual minority older women might help delay the progression to certain chronic diseases and limitations in independent living. Sexual minority older women had higher incomes, educational levels, and employment rates than heterosexual older women despite heightened risks in several health indicators. They were also more likely to have health insurance coverage, whereas NHIS data for adults aged 18 years or older indicate that sexual minority women are more likely than heterosexual women to lack health insurance coverage. It may be that sexual minority older women were aware at a younger age that they had to support themselves and were more likely to seek education and employment despite the traditional roles for women at the time. Recent policy changes may also help them secure health insurance.

The recognition of sexual minority families in the Affordable Care Act (Pub Law No. 111-148) as well as the 2013 Supreme Court decision in Windsor v. United States (570 US ___, 2013) may have made it easier for working sexual minority individuals and those who were married to obtain health insurance.

With respect to health behaviors, our data revealed more sleep problems among sexual minority older women than heterosexual women, a potentially understudied health issue in this population. Sexual minority men, as in previous studies, were more likely to report smoking. However, we also found signs of resilience among sexual minority older adults. Sexual minority older women were more likely to report being former drinkers and smokers, suggesting that many of these women take action to reduce such adverse health behaviors and promote their own health as they age. In addition, as a positive sign that LGB older adults are accessing preventive care, sexual minority older adults fared better than heterosexual older adults in terms of HIV testing, blood pressure screening (among women), and flu shots (among men).

Previous studies have shown that greater levels of social support and community connectedness are associated with good health and optimal aging among LGB older adults. Future studies need to examine aspects of both resilience and risk as a means of understanding the complex health issues in these populations.

Although studies involving larger samples of bisexual older adults are needed, our findings reveal important differences among sexual minority subgroups that need to be considered in prevention, intervention development, and research. Bisexual people may experience elevated stress and social isolation, in part as a result of marginalization within lesbian and gay communities as well as society in general. This disadvantaged status may have contributed to our findings that bisexual older men were at elevated risk for low back or neck pain, mental distress, and smoking and that bisexual older women were at greater risk for poverty.

Limitations

Although the results of our study have important implications for public health...
research and practice, there are a few limitations. Our findings are based on self-reported data; incorporating objective measures would likely reduce errors in estimates. The sampling weights may not have adequately adjusted for sampling bias because of the possibility of higher nonresponse rates on sexual orientation questions among those in older age brackets and racial/ethnic minority groups. The samples of sexual minority older adults in this study were not large enough to allow investigation of health disparity differences among such subgroups. Because the NHIS collects information annually, pooled multiple-year data will allow for further evaluation of the diverse experiences of sexual minority older adults and for the development of targeted prevention efforts and interventions to improve the health of this population. Although the inclusion of a sexual orientation item in the NHIS is an important step forward, data regarding gender identity and expression are still lacking.

Conclusions
This study is a significant step forward in understanding health disparities among sexual minority older adults. Our findings present a complex picture of sexual minority older adult health and suggest both that health disparities persist into older adulthood and that new health concerns emerge with the aging of the sexual minority population. Targeted prevention and intervention programs are needed to identify sexual minority older adults at greatest health risk and to promote good health in later life.

HUMAN PARTICIPANT PROTECTION
The institutional review board of the University of Washington approved this study. Publicly available data were used in the study.

REFERENCES