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Does Sexual Orientation Complicate the Relationship Between Marital Status and Gender With Self-rated Health and Cardiovascular Disease?

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Abstract

A substantial body of work has demonstrated the importance of marital status for health, yet the vast majority of this work has studied heterosexual marriages and relationships. To understand the role of marital status in shaping health among heterosexual, lesbian, gay, and bisexual men and women, we examine data from a probability-based sample of adults living in 40 U.S. states for selected years between 2011–2015. We test two physical health outcomes—poor-to-fair self-rated health and cardiovascular disease—and present predicted probabilities and pairwise comparisons from logistic regression models before and after adjustment for demographic characteristics, socioeconomic status, health behaviors, and depression. Overall, findings reveal some important similarities and differences in the relationships between marital status and health by sexual orientation and gender. First, the health benefits of marriage extend to sexual minority adults, relative to adults who are either formerly or never married. Among heterosexual adults, adjusted models also highlight the healthy status of never-married adults. Second, the health benefits associated with intimate relationships appear less dependent on legal marriage among sexual minorities than among heterosexual adults. Third, we document a persistent health disadvantage for bisexual adults compared with heterosexual adults, particularly among women who are formerly married, indicating some elevated health vulnerability among selected sexual minority women. Fourth, associations between sexual orientation and health are more similar across marital status groups for men than women. Altogether, these findings add much needed nuance to our understanding of the association between marital status and health in an era of increasing diversity in adult relationships.

Keywords

Sexual minority health; Marriage; Relationships; Self-rated health; Cardiovascular disease

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Introduction

Recent years have seen increased research attention to both the diversity of marital status and what those relationships mean for adult well-being. In part, this attention is due to a prominent debate and public dialogue surrounding LGBT status and rights—specifically, the right to marry. This dialogue unfolds within broader debates regarding the defining characteristics of family (Powell et al. 2010) and growing attention from scholars on the status and well-being of sexual minority individuals and families. Legal and political battles aside, U.S. adults are living in increasingly diverse family forms, and Americans are increasingly supportive of same-sex marriage (Compton 2015).

This scholarship also matters because a substantial body of work has demonstrated the importance of marital status for health. Mortality rates and a variety of mental and physical health problems are lower among married persons (Carr and Springer 2010; Waite 1995), and studies have detailed health differences across types of nonmarried states (including never and formerly married) and between men and women, with some work finding that men's health benefits more from marriage than women's health (Zhang et al. 2016). Operating alongside the marriage and health literature is an emerging population health literature documenting health disparities for adults identifying as gay, lesbian, or bisexual relative to adults identifying as heterosexual (Institute of Medicine (IOM) 2011). Much of this work has drawn on a minority stress theoretical understanding, whereby adults sexually identifying as something other than heterosexual experience heightened levels of stigma, discrimination, and social stress (Meyer 2003) that impacts their health and well-being.

To date, relatively few population-level studies have directly examined whether and how the marital status–health relationship is related to sexual orientation among men and women. Existing work suffers from several shortcomings, including the use of such indirect measures of sexual orientation as the gender composition of couples (e.g., Denney et al. 2013; Liu et al. 2013); small samples that prevent specific analyses for gay, lesbian, and bisexual men and women (e.g., Elwood et al. 2017; Reczek et al. 2017); and limited attention to specific health outcomes, including cardiovascular disease (CVD) (Denney et al. 2013; Elwood et al. 2017; Liu et al. 2013; Reczek et al. 2017). To address previous shortcomings and tie together literatures examining marriage and health with those examining sexual minority status and health, we examine data from a probability-based sample of men and women living in 40 U.S. states for selected years between 2011 and 2015, gathered as part of the Behavioral Risk Factor Surveillance System (BRFSS). This affords a unique opportunity to investigate how marital status relates to poor-to-fair self-rated health and CVD among men and women who self-identify as heterosexual, gay, lesbian, or bisexual.

Marital Status, Sexual Orientation, and Health

With the Defense of Marriage Act (DOMA) struck down by the U.S. Supreme Court and marriage now a legal option for sexual minority adults, the social and political implications of this work is timely. Marriage has long been considered beneficial to health. Durkheim found that marriage protected people against suicide in the nineteenth century, and research

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continues to show health benefits from marriage in terms of all-cause mortality, morbidity, functional health, and self-rated health (Carr and Springer 2010; Durkheim 1897/1951; Umberson and Montez 2010). A variety of health-promoting resources are associated with marriage and intimate relationships, including support, economic resources, and social control (Carr and Springer 2010; Jackson 1992; Thomeer et al. 2015; Turner et al. 1995). Importantly, however, Liu and Umberson (2008) showed declining health benefits associated with marriage as never-married people have trended toward being healthier.

Studies have also found evidence of a stronger relationship between marriage and health among men than women (see the review by Kiecolt-Glaser and Newton 2001). For instance, women report caring for others more frequently than men, which can lead to more stress for women and greater social control for their husbands; comparatively, men have more people trying to encourage positive health behaviors and from whom they can ask advice (Bird and Rieker 2008; Read and Gorman 2010; Umberson et al. 1996). However, evidence has also shown that the financial resources associated with marriage, along with the economic burden of leaving marriage, are particularly important to the health status of women (Christakis and Allison 2006; Lillard and Waite 1995; Liu and Umberson 2008).

Considering sexual orientation, there are reasons to presume that marriage and relationships would function similarly in predicting health status across sexual orientation groups. In theorizing on this question, Cherlin (2013:64) noted that because “intimate relationships appear to have similar meanings for same-sex partners and different-sex partners … we might therefore expect marriage and cohabitation to have similar meanings for same-sex and different-sex partners and to therefore have similar effects on health.” Same-sex and different-sex couples share comparable levels of relationship stability and well-being, and function in similar ways overall (Chen and van Ours 2018; Kurdek 2004; Manning et al. 2016). This is meaningful given the role that marital quality and support have for CVD and more broad-based measures of health (Bennett-Britton et al. 2017; Liu and Waite 2014). If part of marriage’s health benefit comes from its stability, then gay and lesbian couples should see associations to health that are similar to those of heterosexual couples. Burgeoning research has supported this assumption, finding no significant difference in self-reported health between partnered gay and lesbian adults compared with married heterosexual people (Wienke and Hill 2009). Reczek and colleagues (2017) similarly found no significant difference in self-rated health between married heterosexual and lesbian/gay adults included in the 2013–2014 National Health Interview Survey.

Yet, there are also reasons to expect that marriage-health patterns will differ across the specific intersections of sexual orientation. The institution of marriage, historically, is defined by its heterosexual nature and supported through traditional gender norms. By examining how marriage—and its dissolution—may be differently experienced by gay, lesbian, and bisexual men and women (40% of whom were cohabiting or married in 2013; see Gates 2014), we aim to evaluate how intersecting sexual orientation and gender identities are influenced by an institution previously unavailable to some.

Although health disparities arise from patterns of disadvantage or social marginalization (Braveman et al. 2011), *intersectionality theory* emphasizes that social identities are multiple

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and intersecting and that all persons hold various combinations of identities that confer unique advantages and disadvantages in terms of health status and other life outcomes (Bowleg 2012; Collins 2000). Notably, bisexual men and women were not included in the studies by Wienke and Hill (2009) and Reczek and colleagues (2017). Yet bisexual people are a distinct group and experience more prejudice and discrimination than gay and lesbian people (Herek et al. 2007; Pew Research Center 2013).

As detailed by *minority stress theory* (Meyer 2007), sexual minorities experience persistent and unique stressors resulting from their sexual orientation—stressors that can emerge from not only individual experiences but also structures and institutions that treat people differentially based on their sexual orientation (Meyer 2003), with potential health consequences (Frost et al. 2015). Bisexuals may fare particularly poorly (e.g., Persson and Pfaus 2015) because they must contend with biphobia from both the gay and straight community (Balsam and Mohr 2007; Pallotta-Chiarolli 2016). Qualitative research has shown that bisexuals face extensive stigma from current and prospective partners about their sexuality (Li et al. 2013) and from family as well as the gay community about the stability and quality of their sexual relationships (Bradford 2013; Buxton 2007).

A greater proportion of bisexual men and women report being in a different-sex than same-sex relationship (Pew Research Center 2013), which could reduce the amount of stigma specifically resulting from same-sex relationships in daily interactions with the public. However, scholarship has more generally found that regardless of the gender of their partners, bisexual men and women in relationships face myriad challenges that are stressful and potentially detrimental to their health and well-being (Dobinson et al. 2005; Li et al. 2013). Bisexual adults report lower average life satisfaction and less emotional support than either gay/lesbian or heterosexual adults (Gorman et al. 2015), as well as low levels of access to bisexual-specific community spaces that are inclusive and supportive of bisexual adults (Dodge et al. 2012). This may result in them being overall less healthy than gay, lesbian, and heterosexual adults as well as receiving less of a health benefit from marriage. Bisexual people also have lower socioeconomic standing and are more likely to live in poverty than gay, lesbian, and heterosexual adults (Badgett et al. 2013; Denney et al. 2013; Gorman et al. 2015). This would perhaps mean that bisexual adults have fewer resources necessary for the promotion and maintenance of health and may be more vulnerable to worse health if they exit marriage.

More generally, intersectional scholarship highlights the potential for gender to moderate how sexual identity relates to health status, and bisexual women occupy a particular intersectional position that is associated with a variety of health risks. Studies have consistently shown poorer health ratings for bisexual adults and particularly for bisexual women (Blosnich et al. 2014; Conron et al. 2010; Dilley et al. 2010). For example, Gorman and colleagues (2015) showed than bisexual women report the lowest average household income compared with bisexual men and gay/lesbian and heterosexual men and women. Similarly, a substantial portion of bisexual women (30%) reported that they missed a doctor visit last year because of cost. Kates et al. (2018) also documented that a very high proportion of bisexual women (61%) have been victims of intimate partner violence. As such, bisexual women may benefit the least, health-wise, from marriage.

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Findings on socioeconomic standing across the intersections of gender and sexual orientation for heterosexual and gay/lesbian adults are less clear. Regarding income, early research showed that lesbian women earn more money than heterosexual women, and gay men earn less money than heterosexual men (Black et al. 2007). More recent research has found that lesbian and gay adults have higher income and education than heterosexuals (Denney et al. 2013; Gorman et al. 2015). The Williams Institute, in contrast, reported that men and women in same-sex couples have higher rates of poverty than different-sex couples (Badgett et al. 2013), and other research similarly found that LGB men and women are about twice as likely to be unemployed (Charlton et al. 2018).

Patterns for insurance status, however, are clearer. Ponce et al. (2010) showed that partnered lesbian women are less likely to have insurance than partnered gay adults, and Dillender (2015) found that coupled gay men are more likely than coupled lesbian women to obtain insurance through their own employer. These findings suggest that the health of lesbian women in relationships (marital and otherwise) might be more vulnerable than that of heterosexual women in similar relationships, and recent work by Elwood and colleagues (2017) supports this interpretation.

Theories of social control (Umberson 1987) suggest another avenue through which gender may intersect with sexual orientation and relationship status to shape health outcomes. Part of the health benefit associated with marriage occurs through partner investments in health, which increase length of life and decrease years of illness among married adults. Enhanced health benefits of marriage for heterosexual men are often attributed to their spouse's greater social connections, provision of emotional support, and their monitoring of their husbands' health and health behavior (see review by Zhang et al. 2016). Given the documented health benefits associated with partnering with a woman, it is possible that gay and lesbian couples would experience different benefits to marriage than heterosexual couples, with perhaps a diminished marriage-health connection for gay (and some bisexual) men, although existing scholarship is somewhat contradictory on this point. Reczek and Umberson (2012) showed that although few men in heterosexual marriages perform health behavior work, cohabiting gay men are similar to heterosexual married and lesbian women in the health work performed in intimate relationships. Yet recent work has also found that gay men perform the least amount of care work when their partner is sick, and lesbian women perform the most (Umberson et al. 2017, 2016).

Health behaviors—an important target of social control or care work—do seem to vary by marital status and sexual orientation. For instance, same-sex cohabitors have a higher smoking risk than different-sex married adults (Reczek et al. 2014a) but have similar levels of alcohol use (Reczek et al. 2014b). It is unclear how health-related social control of bisexuals may vary by marital status and sexual orientation, but it likely differs based on whether the bisexual person is in a same-sex or different-sex relationship. Participation in these health behaviors may unevenly mediate the relationship between marital status and health across sexual orientation groups and may be particularly important in predicting specific health outcomes, such as CVD.

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Sexual Orientation, Self-rated Health, and Cardiovascular Disease

We focus on two physical health outcomes in this study. The first, self-reported health (SRH), is a widely used measure of morbidity that is predictive of subsequent health status and mortality (Ferraro and Farmer 1999; Idler and Benyamini 1997; Schnittker and Bacak 2014). Additionally, SRH does not require a doctor diagnosis, which may be important given that sexual minorities have more limited access to medical services than heterosexuals. Second, CVD is a prevalent and life-threatening condition associated with significant disability and financial expense among U.S. adults (Centers for Disease Control and Prevention (CDC) 2016a), and scholars have called for more work examining specific health outcomes in families and health research (see Carr and Springer 2010). Cardiovascular disease also has a strong behavioral component, and several of the behavioral risk factors for CVD occur unevenly across sexual-orientation groups and are common targets of social control in marriage (Case et al. 2004; Dilley et al. 2010; Lunn et al. 2017; National Institutes of Health (NIH) 2017). Moreover, components of CVD require doctor diagnosis and connection with the health care system.

For self-rated health, two recent studies were the first to report that self-reported health is worse among same-sex cohabiting women compared with women in different-sex married relationships, even after socioeconomic status differences across the two groups were accounted for (Denney et al. 2013; Liu et al. 2013), and that these relationships operated less strongly for men. Elwood et al. (2017) also examined differences in health status across legally recognized marriages, finding that self-rated health is lower among legally married lesbian women compared with legally married heterosexual women, with no difference for men. And a recent article by Reczek and colleagues (2017) found that the predicted probability of reporting poor-to-fair health was not statistically different between heterosexual and gay men within each marital status group after adjustment for demographic and socioeconomic characteristics. Among women, analyses also showed no significant difference between married lesbian and heterosexual women. However, cohabiting and never-married lesbian women experienced a significantly elevated probability of poor-to-fair health relative to their heterosexual peers, and previously married lesbian women experienced a significantly lower probability of poor-to-fair health than previously married heterosexual women. Altogether, these studies showed more variation in self-rated health among women across the intersections of sexual orientation and marital status.

For CVD, no existing work has examined the intersections of sexual orientation, gender, and marital status. Thus, risk patterns for CVD by sexual orientation are not clear. Some work has found that relative to heterosexual men and women, sexual minority women but not men had an elevated CVD rate (Fredriksen-Golden et al. 2013; Jackson et al. 2016). Other work, including a review of the literature, has found few to no difference across sexual orientation groups (Caceres et al. 2017; Conron et al. 2010; Eliason et al. 2017).

The Current Study

Carr and Springer (2010) discussed how scholars have repeatedly challenged the notion that marriage is always protective for health status and have increasingly emphasized differences

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based on factors including the structural aspects of unions (e.g., heterosexual vs. same-sex partnership) and nonmarital relationship statuses (e.g., never married, formerly married). As such, and following McCall (2005), we use an intercategorical approach to systematically compare how aspects of physical health differ across the intersections of marital status (currently married, formerly married, never married, and member of an unmarried couple) and sexual orientation (heterosexual, gay/lesbian, and bisexual). Additionally, we adjust for demographic characteristics and other factors that reflect primary causal mechanisms linking marriage and health (Carr and Springer 2010): socioeconomic status, health behaviors, and psychological distress. Altogether, this lets us consider whether there is similarity or difference in the association between marital status and health for men and women across detailed sexual orientation groups.

Methods

Data and Sample

Data from this study come from the Behavioral Risk Factor Surveillance System (BRFSS), a nationally representative survey of adult men and women organized by the CDC (2015) and conducted by individual states. BRFSS queries participants about a variety of health-related factors, including socioeconomic and demographic characteristics, health behaviors and status, and access to and use of health care. Households are selected by BRFSS through a disproportionate stratified sample design, with one individual adult member randomly selected to be surveyed for each household (CDC 2016b).

Our analysis uses data from BRFSS's core component and optional module questions. BRFSS requires that states ask certain questions, which make up the core component questionnaire. Additional questions can be included through one of two routes: (1) states may ask questions they write themselves, or (2) they may opt to include questions from one of a variety of topical modules available through the national BRFSS. Between 2011 and 2015, 40 states (see Table A1, online appendix) included a sexual orientation question, added through one of these two routes.[1] Our analytic sample includes all states that asked about sexual orientation during this period, which includes 107 state-years of data and a sample of 1,025,992 adults. We limit this sample to (1) men and women who identify as heterosexual, gay/lesbian, or bisexual (excluding those who are missing on sexual orientation or identify their sexuality as "other"; remaining $N = 885{,}690$);[2] and (2) respondents who are not missing on the dependent variables ($N = 883{,}277$ for self-rated health, $N = 882{,}993$ for cardiovascular disease). Our final analytic sample includes 5,724 lesbian women; 6,895 gay men; 6,321 bisexual women; 3,483 bisexual men; and a large sample (863,266) of heterosexual adults.

[1] In 2014, BRFSS began offering an optional module on sexual orientation; prior to this date, all questions on sexual orientation were added independently by states.

[2] In total, 135,919 people declined to answer or responded that they did not know their sexual orientation, and 4,383 identified their sexual orientation as "other."

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Measures

Poor-to-fair self-rated health is defined as 1 = poor or fair health, and 0 = good, very good, or excellent health. Dichotomizing self-rated health is common in the literature and remains an accurate predictor of morbidity and mortality (Manor et al. 2000). Similar to other studies (e.g., Blosnich et al. 2014), *cardiovascular disease* is measured as 1 = has had a heart attack or a stroke, or has been diagnosed with coronary heart disease, and 0 = has not experienced or been diagnosed with any of these conditions.

Sexual orientation measures whether someone identifies as heterosexual, gay or lesbian, or bisexual. Although the exact wording varies slightly on state-written sexual orientation questions, it was most often asked as, "Do you consider yourself to be: 1) heterosexual/straight, 2) lesbian or gay, 3) bisexual?" Some respondents volunteered that their sexual orientation could be categorized as other, stated that they did not know, or refused to answer; as mentioned earlier, these cases were excluded from the analytic sample. *Marital status* is measured as currently married, part of an unmarried couple, formerly married (widowed, divorced, or separated), or never married.[3],[4] We combine sexual orientation and marital status into one measure with 12 categories: heterosexual married, gay/lesbian married, bisexual married, heterosexual unmarried couple, gay/lesbian unmarried couple, bisexual unmarried couple, heterosexual formerly married, gay/lesbian formerly married, bisexual formerly married, heterosexual never married, gay/lesbian never married, and bisexual never married (see Table 1 for sample sizes). As Demaio and colleagues (2013) discussed, qualitative work examining how persons in same-sex relationships answer marital status questions has found that very few of these adults report as "married" unless they are legally wed. This suggests that although there may indeed be variability within the "married" category for sexual minority adults (Carpenter and Gates 2008), there is also considerable similarity in how persons choose to identify.[5]

We stratify all analyses by *gender*. Demographic control measures include *age at interview*, *race/ethnicity* (non-Hispanic White, non-Hispanic Black, Hispanic, other), and *number of children under age 18 in household* (0 to 5+). Socioeconomic measures include *education* (less than high school, completed grade 12 or GED, some college, college or more), *annual household income* (less than $25,000; $25,000–$49,999; $50,000–$74,999; more than $75,000), and *employment* (1 = currently employed, 0 = no).

Health behavior measures include whether the respondent had a *checkup in the past year* (1 = yes, 0 = no), *exercised in the past month* (1 = yes, 0 = no), is a *current smoker* (1 = yes, 0

[3]Because the BRFSS does not include a full household roster and the phrasing of the question includes the term "unmarried couple" rather than "cohabiting couple," we do not assume that all respondents who are part of an unmarried couple are also cohabitating.
[4]Although studies examining how relationships relate to health status for sexual minority adults have used household roster information to indirectly identify adults living with a same-sex partner (e.g., Denney et al. 2013), the household roster information available in the BRFSS is more limited. It does identify the number and gender of adults living in the household with the respondent but not the relationship to the respondent. Thus, we rely on self-reported marital status to measure relationship status of respondents.
[5]In analyses not shown, we explored limiting our sample to respondents in states with marriage equality, but implementing this restriction biased our sample to states with more positive LGB climate. It also reduced our sample size substantially, by 43% (including a 38% reduction of lesbian and gay respondents and a 36% reduction in bisexual respondents), limiting our ability to analyze the 12 sexual orientation × marital status × gender groups discussed in this article. For these reasons (and because adults can cross state lines to get married), we do not restrict our sample to the state-years of data when marriage equality had been legally implemented.

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= no), and is *overweight or obese* (1 = body mass index ≥ 25, 0 = < 25). For psychological distress, we include the number of poor mental health days a person experienced in the past month.

Finally, previous scholarship has shown that same-sex couples in states with marriage equality had better health than same-sex couples in states without marriage equality (Kail et al. 2015). As such, all models control for *marriage equality*, a dichotomous measure marking whether same-sex marriage was legal in that state during June of the year of the survey.[6]

Analytic Plan

Item nonresponse for measures in our sample is small (2.9%), with the exception of income, for which 14.7% of cases were missing. We perform multiple imputation to deal with item nonresponse, maximize the sample, and avoid biasing the data (Allison 2002). In keeping with best practices, respondents who are missing on the dependent variable are included while creating the imputed data but then excluded from the analysis (Von Hippel 2007). Similarly, those missing on sexual orientation are included in the imputation model but not in the analyses. The multiply imputed data set is created using the *mi impute chain* command in Stata 14.0 and includes 10 imputations.[7]

We begin with descriptive analyses that present gender-stratified weighted percentages for each health outcome and independent predictor, comparing gay, lesbian, and bisexual adults with heterosexual adults within each marital status category. We then run a series of gender-stratified logistic regression models to assess the extent to which observed relationships between marital status-by-sexual orientation and physical health are confounded by demographic characteristics, socioeconomic status, health behaviors, and mental health. Importantly, the marital status by sexual orientation indicator is included as a combined characteristic in the logistic regressions and predicted probability output that follows (see the online appendix for the regression output). That is, we are not testing interaction terms between marital status and sexual orientation. To control for differences in LGB climate across the 40 states in our analytic sample, we also adjust for marriage equality (i.e., whether in a given state-year of data, that same-sex marriage was legal) in all models. Models are weighted, and we adjust for the complex survey design using Stata *svy* commands. To evaluate differences within gender and marital status but *across* sexual orientation (e.g., comparing never-married lesbian and bisexual women with never-married heterosexual women), we use the results of these logistic regressions to calculate predicted probabilities and significance tests for the average difference in probabilities across the marital status–by–sexual orientation categories.[8] We create predicted probabilities using all observed data for hypothetical populations of all heterosexual married men, all heterosexual married women, and so on. We then conduct pairwise comparisons of the difference in probabilities (the average marginal effects) for Group 1 (e.g., heterosexual married men) versus Group 2 (e.g.,

[6]We chose June because it is in the middle of the year and allows us to capture marriage equality resulting from the Obergefell U.S. Supreme Court decision.
[7]All dependent and independent variables are used in the multiple imputation by chained equations (MICE) procedure.
[8]We randomly select and extract an imputed data set, performing all predicted probabilities and pairwise comparisons accordingly. For sensitivity, we replicated this process on multiple randomly selected imputed data sets. Results were nearly identical in every case.

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gay married men) for all possible combinations. We repeat this process to test the differences within gender and sexual orientation but across marital status (e.g., comparing lesbian women who are unmarried with lesbian women who are married). For ease of presentation, we graph these results as figures.

Results

Table 1 presents sample characteristics, stratified by marital status, gender, and sexual orientation. Panel A shows weighted percentages for women, and panel B shows weighted percentages for men. Overall, Table 1 shows that factors associated with both health harm and advantage do not distribute evenly across the sample. For example, across marital status groups, gay men and lesbian women are socioeconomically advantaged relative to heterosexual and bisexual adults: gay and lesbian adults report more completed schooling and higher household incomes. Table 1 also demonstrates consistent disadvantage for bisexual adults in terms of poor mental health; regardless of marital status, bisexual men and women report a substantially higher number of poor mental health days in the last month than either heterosexual or gay/lesbian men and women. The number of poor mental health days is highest among bisexual women, especially among bisexual women who are not married. This contrasts with heterosexual married men, who report the lowest number of poorer mental health days of any group. Another important finding is that marriage is associated with health advantages for gay/lesbian and bisexual adults, similar to findings for heterosexuals.

Table 2 describes the associations among sexual orientation, marital status, and each health measure for women and men. Significance tests are included to assess, among men and women, whether health status differences exist between sexual minority and heterosexual adults *within each marital status group* (e.g., between bisexual married women and heterosexual married women) and between married and nonmarried adults *within each sexual orientation category* (e.g., between married and never-married gay men).

Comparisons Within Marital Status

We begin by discussing comparisons within each marital status group, contrasting sexual minority to heterosexual adults. Looking first at the columns in Table 2 for married adults, we see similarity in health status between heterosexual men and gay men, as well as between heterosexual and lesbian women, for both poor-to-fair SRH and CVD. Differences in health outcomes between married heterosexual and bisexual adults are gender-specific. Among men, we see no significant differences in rates for each outcome between those who identify as gay, bisexual, or heterosexual. For women, married bisexual adults report a higher rate of poor-to-fair SRH than married heterosexual women (19.4% vs. 13.9%).

Next, for unmarried couple adults, Table 2 shows some differences in health between gay/lesbian and heterosexual adults. Among men, rates for CVD are higher among gay than heterosexual men (11.7% vs. 5.7%), yet rates for poor-to-fair self-rated health are lower for lesbian women than heterosexual women (14.5% vs 19.2%). There are no significant differences in SRH across sexual orientation groups for unmarried couple adults.

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Turning next to the formerly married, we see little difference across groups. Relative to their formerly married heterosexual counterparts, gay men, lesbian women, and bisexual men, have prevalence rates that are not significantly different for either health condition. The only contrast that is significantly different is for poor-to-fair health among bisexual women, who report worse health at a higher rate than heterosexual women (35.1% vs. 26.4%).

Finally, among the never married, we see the strongest evidence of a significant difference between heterosexual and sexual minority adults. In particular, differences between gay/lesbian and heterosexual adults are quite strong; for both outcomes, rates are significantly higher among gay and lesbian adults. For bisexual adults, a significantly higher proportion (men and women) report fair-to-poor SRH.

Comparisons Within Sexual Orientation

Looking first among the heterosexual population, Table 2 shows similar patterns for men and women. Most striking is the consistently poorer health of formerly married heterosexual adults, who report significantly higher rates of both health outcomes than heterosexual married adults. Also, rates of CVD are significantly higher among married heterosexual men and women relative to both unmarried couple and never-married heterosexual adults. However, heterosexual married adults report a significantly lower rate of poor-to-fair SRH relative to heterosexual unmarried couple adults but a significantly higher rate of poor-to-fair SRH relative to never-married heterosexual men.

Turning to gay/lesbian adults, we again see that the formerly married report consistently worse health than the married. Table 2 also shows more similarity between married and unmarried couples for gay men and lesbian women than for heterosexual men and women; contrasts for both health outcomes are not significant. For never-married gay/lesbian adults, contrasts are gender- and condition-specific. Poor-to-fair SRH rates are higher among never-married men and women: never-married lesbian women report nearly double the rate of poor-to-fair SRH than married lesbian women (23.7% vs. 12.6%). For CVD, the contrast is not significant for lesbian women, but married gay men do report a significantly higher rate of CVD than never-married gay men (9.2% vs. 6.4%).

Finally, the columns for bisexual adults again show that the formerly married consistently report worse health than the married, and contrasts for all health conditions are significant. In addition (and consistent with findings for gay/lesbian adults), for both men and women, health status contrasts between married and unmarried couple adults are similar and not significant. And for the never married, although we see similarity in SRH relative to married bisexual men and women, married bisexual men report CVD conditions at a significantly higher rate than never-married bisexual men.

Logistic Regression Models: Predicted Probabilities and Pairwise Comparisons

To streamline a voluminous amount of information, and more generally to ease comparisons (1) within marital status and across sexual orientation and (2) across marital status and

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within sexual orientation, we present our multivariate findings as predicted probabilities and significant pairwise comparisons in Figs. 1, 2, 3, and 4. In these figures, we graph the probabilities associated with each group and then note the groups in which a significant pairwise comparison ($p \leq .05$) exists either within marital status and across sexual orientation or across marital status and within sexual orientation. If there are no significant differences within these comparisons, then there are no groups denoted above the column. Figures 1–4 show predicted probabilities calculated from models that (1) adjust for only demographic characteristics (see Model 1 in Tables A2–A5, online appendix) and (2) adjust for all control measures (see Model 5 in Tables A2–A5, online appendix).[9]

Poor-to-Fair Self-rated Health

We begin by discussing pairwise comparisons drawn from models predicting poor-to-fair SRH. Figure 1 displays predicted probabilities of men having poor-to-fair SRH across sexual orientation and marital status. Regarding pairwise comparisons across marital status but within sexual orientation, significant differences consistently appear among heterosexual men. In baseline models, heterosexual married men have the lowest probability, and formerly married men have the highest probability, of poor-to-fair SRH relative compared with every other marital status group. However, these differences are attenuated with controls, and the adjusted model also shows that a slight, significant health advantage emerges for never-married heterosexual men relative to all other marital status groups. Turning to sexual minority men, we find that unmarried couple, formerly married, and never-married gay and bisexual men have higher predicted probabilities of poor-to-fair SRH than their married counterparts in baseline models, but these contrasts are reduced to nonsignificance after adjustment for controls.

Looking across sexual orientation but within marital status, bisexual men are disadvantaged compared with heterosexual and gay men among the never married. Bisexual men who are part of an unmarried couple also show significantly higher probabilities of poor-to-fair SRH compared with unmarried couple gay men. However, all contrasts become nonsignificant after adjustment for controls; thus, all else being equal, the probability of poor-to-fair SRH among men in different sexual orientation groups is similar regardless of their marital status.

For women, Fig. 2 shows that baseline models considering differences within sexual orientation and across marital status indicate that among heterosexual and bisexual women, being married is associated with the lowest probability of poor-to-fair SRH. For lesbian women, baseline models show similarity between married and unmarried couple women: the probability of poor-to-fair SRH is significantly higher among formerly and never-married lesbian women. However, after adjustment for all controls, patterns change substantially. Among lesbian and bisexual women, all marital status contrasts become nonsignificant. Among heterosexual women, however, never-married women have a significantly lower probability (.10) of poor-to-fair SRH than formerly married (.12) and married women (.12).

[9]The sexual orientation and marital status categories are a single variable, not an interaction.

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Regarding pairwise comparisons within marital status and across sexual orientation, bisexual women are substantially disadvantaged compared with heterosexual and lesbian women in nearly all marital status groups in baseline models. Except for the never married, lesbian and heterosexual women fare similarly within marital status. Formerly married bisexual women continue to be disadvantaged relative to heterosexual women even in the fully adjusted models. The fully adjusted model also shows that heterosexual never-married women have a significantly lower probability (.10) of poor-to-fair SRH than either lesbian (.15) or bisexual never-married women (.14). However, for unmarried couple and married women, all contrasts become nonsignificant with adjustment for controls.

Cardiovascular Disease

Findings for CVD are shown in Fig. 3 (for men) and Fig. 4 (for women). For men, pairwise comparisons across marital status but within sexual orientation show the most evidence of significant variation among heterosexual men. Models show that their probability of CVD is lowest among married and never-married men relative to formerly married and unmarried couple men. Once controls are added, however, differences are substantially attenuated and show similarity in the probability of CVD between married, unmarried couple, and formerly married heterosexual men as well as a significantly lower probability among never-married heterosexual men. For gay men, baseline models show that unmarried couple and formerly married men have higher odds of CVD compared with married men, but this attenuates to nonsignificance in the fully adjusted models. Interestingly, significant differences between unmarried couple gay men (.086) and never-married gay men (.048) emerge in the adjusted models. For bisexual men, we see less variation, although in the baseline model, the probability of CVD is higher among formerly married than currently married bisexual men.

Turning to comparisons within marital status and across sexual orientation for men, neither the baseline nor the fully adjusted models show evidence of significant variation based on sexual orientation across any marital status. It appears that the associations of sexual orientation with CVD remain statistically similar for men across marital status groups.

Finally, we discuss the role of marital status and sexual orientation in predicting CVD among women (see Fig. 4). Looking first at pairwise comparisons across marital status but within sexual orientation, the baseline model shows that married women have the lowest probability of CVD, and formerly married heterosexual women have the highest probability. In the fully adjusted model, married heterosexual women retain a slight advantage over formerly married women, but their probability of poor-to-fair SRH is now slightly higher than that of never-married women. Among lesbian and bisexual women, baseline models show that formerly married women have a higher probability of CVD than either married or unmarried couple women; however, these contrasts are reduced to nonsignificance in the fully adjusted model with one exception: bisexual formerly married women maintain a slight health disadvantage compared with bisexual unmarried couple women.

Within marital status and across sexual orientation, only bisexual formerly married women fare significantly worse compared with heterosexual formerly married women. All other within–marital status comparisons are nonsignificant.

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Conclusions

To date, relatively little scholarship has considered how sexual orientation, gender, and marital status are jointly associated with health status. Our findings reveal several important conclusions. First, regarding health benefits associated with marriage, findings for sexual minorities indicate some evidence of health advantage among the married compared with both formerly and never-married people. For self-rated health, baseline models show that the best health status occurred among married gay/lesbian and bisexual adults. For CVD, the pattern is not as strong but still shows better health among married relative to formerly married sexual minority adults. In each instance, however, this marital advantage is removed with adjustment for controls. Previous literature argued that marriage's health benefit arises from finances, social control, and social connectedness (Carr and Springer 2010). After adjusting for aspects of socioeconomic status, health behaviors, and poor mental health, we find that few differences in health status remain across marital status groups for men and women, regardless of sexual orientation. In this way, marital status seems to confer the same benefits to lesbian, gay, and bisexual men and women as it does heterosexual adults, fulfilling predictions by Cherlin (2013) and partially confirming research by Wienke and Hill (2009) and Reczek et al. (2017).

In addition, heterosexual never-married adults have significantly lower probabilities of poor health and CVD even after adjustment for controls. Never-married people have trended toward being healthier in recent years, likely due in part to their increasing income (Liu and Umberson 2008). It is also possible that as people wait longer to get married (U.S. Census Bureau 2018), those who are never married may be less likely to be stigmatized or viewed as failing in some manner, and therefore exhibit fewer health differences compared with heterosexual adults. Our results confirm this trend: heterosexual married people do not have better self-rated health in fully adjusted models compared with other marital status groups, and never-married men and women maintain a significant health advantage after adjustment for controls.

Why never-married heterosexual adults—but not gay, lesbian, or bisexual adults—would hold this health advantage is unclear. Following an additional suggestion made by Liu and Umberson (2008), perhaps the meaning of being never married has changed alongside never marrieds' greater access to social networks and resources. This may counteract the general trend of never-married people having a health advantage within the LGB community by relatively increasing the health benefit of marriage. Access to legal marriage may also have decreased the need for gay community life (Ocobock 2018). This may inordinately influence the social connectedness of LGB people not currently in relationships, thereby reducing their health relative to sexual minorities in relationships.

Another key finding is that the health benefits associated with intimate relationships appear less dependent on legal marriage among sexual minorities. This is shown in both the descriptive statistics and in baseline regression models, which show more similarity between married and unmarried couple adults among sexual minorities than among heterosexuals. Peplau and Fingerhut (2007) noted that the majority of gay and lesbian couples are in dual-earner relationships and place importance on power equality in their relationships.

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Unmarried gay and lesbian couples are often the recipients of cooperative health behavior work, with both participants influencing each other's health. This is in contrast to heterosexual marriages, in which mostly women engage in improving their partner's health (Reczek and Umberson 2012). This would potentially confer health benefits associated with marriage for heterosexual men to unmarried queer couples, and thus less of a health difference among sexual minority adults compared with differences with heterosexual adults. At the same time, the inherent messiness of defining marital status for a population that has historically been denied legal marriage may also contribute to the heightened similarity in health status between sexual minorities in married and unmarried couple relationships. For instance, heterosexual unmarried couples may be unmarried because they are not yet ready for marriage, yet gay, lesbian, and bisexual unmarried couples may be unmarried due to lack of marriage equality. This would make identifying as an unmarried couple qualitatively different for sexual minority and heterosexual adults.

Our findings also indicate a persistent health disadvantage for bisexual compared with heterosexual adults, particularly among bisexual women who are formerly married. In baseline models for men and women, bisexual adults are most frequently disadvantaged within their marital status. Although this is attenuated completely for men in adjusted models, formerly and never-married bisexual women continue to be disadvantaged compared with heterosexual women in predicting self-rated health, as are formerly married bisexual women compared with heterosexual women for CVD. Bisexual adults in our sample are disadvantaged on key health promoting indicators included in this study (e.g., socioeconomic status), and they likely experience conditions unique to their sexual identity that harm their health and are not examined, including stigma and discrimination arising from their status as minorities within the minority (Herek et al. 2007). That our study shows elevated and distinctive health vulnerability among bisexual women who are formerly married ties directly to predictions from intersectional scholarship, where the risk and harm associated with holding multiple disadvantaged statuses has long been articulated (Bowleg 2012; Hill Collins and Bilge 2016; Hancock 2016). Research has shown that women's health is worse than men's health after exiting marriage due to their more tenuous financial status (Christakis and Allison 2006). Because bisexual women are an economically vulnerable group, exiting marriage and becoming even more economically vulnerable may explain at least part of the stronger negative association between health and marital status seen for this group. More generally, this reflects intersectional arguments wherein health and well-being are simultaneously shaped by multiple forms of identity (Bowleg 2012; Collins 2000).

Additionally, our findings show that sexual orientation has similar associations with health across marital status among men. For CVD, none of the contrasts across sexual orientation and within marital status are significant in either baseline and fully adjusted models. For self-rated health, no contrasts are significant after adjustment for controls. This finding is similar to that of recent work by Reczek and colleagues (2017), which examined how marital status and sexual orientation related to self-rated health among adults in the National Health Interview Survey and found more evidence of difference among women. Elwood and colleagues (2017) similarly found greater differences in the association between marriage and health among women.

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In many ways, findings from our regression models support Cherlin's (2013) prediction: health status among those in similar marital status groups is similar regardless of sexual orientation (e.g., marriage and relationships are associated with better health, and exiting marriage is associated with worse health for everyone). By and large, these findings indicate that the health benefits associated with marriage and relationships do not appear dependent on the different-sex nature of the relationship. Interestingly, the similar associations of relationship status on health across sexual orientation continue to exist regardless of whether we control for state-level marriage equality in sensitivity models. Although marriage equality is a significant predictor of health (see Tables A2, A3, and A5 in the online appendix), it does not fundamentally alter the association between relationships and health. This suggests that what matters for health is not only the broader environment but also the personal relationships formed within those contexts.

Although an important step in studying marriage benefits to health, our study brings with it several limitations. First, we use cross-sectional data, preventing us from studying transitions into or out of marriage and other relationship statuses as well as disentangling social causation versus selection (although studies suggest that both are operating; see Carr and Springer 2010). Second, we do not know the gender of the respondent's partner. It is possible that there are differential associations for health, for example, among bisexual people depending on the gender of their partner, but we are unable to test this. Third, we include data collected before the *Obergefell* U.S. Supreme Court decision, which made marriage equality federal law in 2015. Although we control for marriage equality in a state, the emotional and legal significance of *Obergefell* as well as the widespread availability and recognition of gay marriage could result in different health patterns than those documented here. Fourth, we have data from only the 40 states that chose to ask about sexual orientation. It may be that LGB people living in states that chose to ask about sexual orientation experience less minority stress than those in states that did not ask about it. This would make our results more conservative.

There are many paths for future research. Much remains unknown about mechanisms connecting marital status to health, especially among sexual minorities. Some work has suggested that socioeconomic status operates as a key driver of health differences for persons living in different-sex and same-sex relationships (e.g., Denney et al. 2013), which aligns with a broader array of scholarship documenting socioeconomic status as a fundamental cause of health variability across sociodemographic groups (Link and Phelan 1995). In this study, we identify intricate similarity and difference, but much work remains to identify specific mechanisms linking sexual orientation, marital status, and health outcomes among men and women. Additionally, research evaluating a wider array of health conditions is warranted, as is work detailing the mechanisms linking sexual orientation and specific health outcomes. Such work could help explain, for instance, why the associations between marital status and sexual orientation are different for heart disease and self-rated health among men and women. Finally, the study took place during a period of changing legal and cultural norms surrounding gay marriage. Future research should examine how the relationship between health and marital status differs for LGB adults in the years following *Obergefell* versus during the time of transition.

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For decades, research on marriage and health has found that relationship status is an important predictor of health. Our study set out to understand whether sexual orientation complicates the relationship between marital status and health, and we show that to a certain extent, it does. Comparing sexual minorities with heterosexual adults, we find some evidence of similarity. For example, exiting marriage is detrimental, and currently being a member of an intact marriage is an advantage to health for the majority of adults. At the same time, important distinctions need to be better understood. For example, formerly married heterosexual adults have worse health than married heterosexual adults, but that association is not as clear for gay and lesbian adults—perhaps because of the distinct reasons why sexual majority and minority adults exit a union. In an era of increasing diversity among—and changing attitudes toward—partnership and family types, attempts to understand the links between families and health must employ diverse data sources and methods in working toward better health and longer lives for all.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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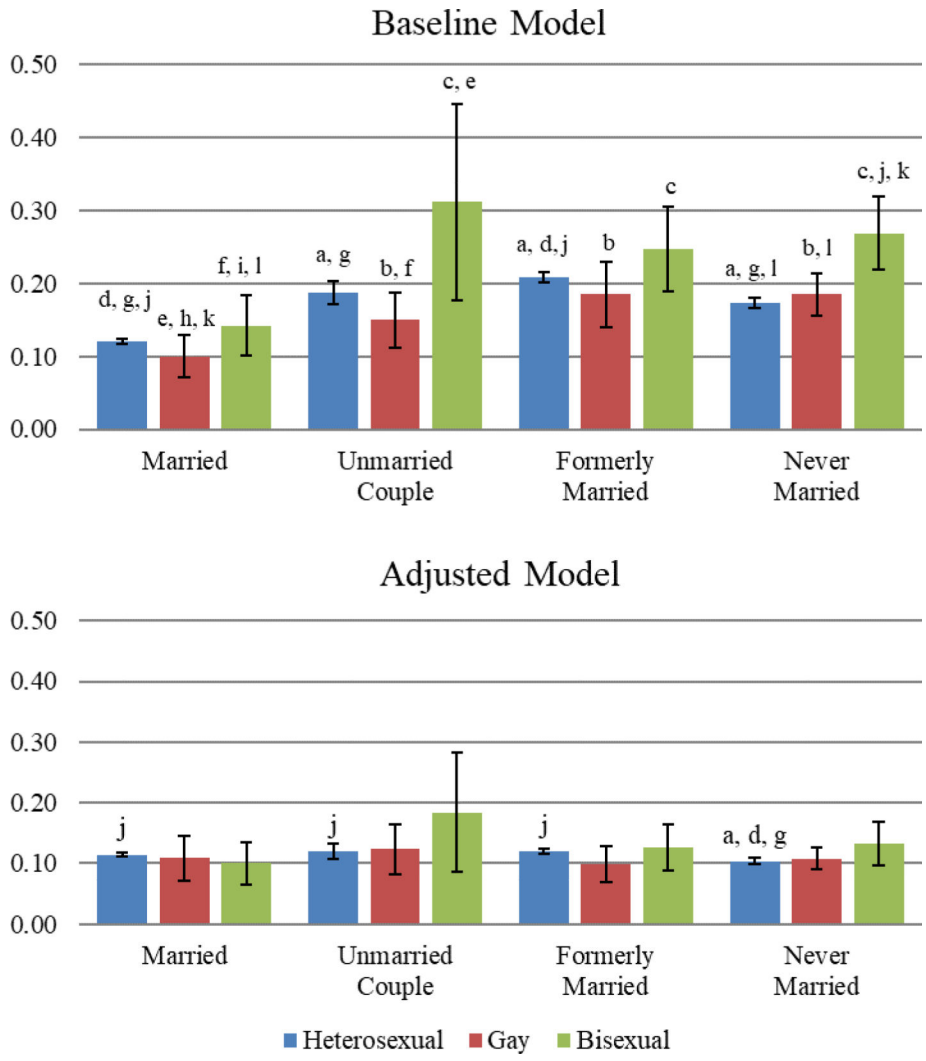

Figure 1: Predicted Probability of Poor-to-Fair Self-Rated Health Among Men

Notes: Baseline model adjusts for demographic controls (based on Model 1 of Appendix Table 2). Adjusted model includes demographic, socioeconomic, health behaviors, mental health, and marriage equality controls (based on Model 5 of Appendix Table 2). Columns represent the predicted probability of poor-to-fair self-rated health for each group. Letters above each column represent significant comparisons ($p<.05$) within sexual orientation group or within marital status group. Bars represent 95% confidence intervals.

a = Heterosexual married
b = Gay/lesbian married
c = Bisexual married
d = Heterosexual unmarried couple
e = Gay/lesbian unmarried couple
f = Bisexual unmarried couple
g = Heterosexual formerly married
h = Gay/lesbian formerly married
i = Bisexual formerly married

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j = Heterosexual never married
k = Gay/lesbian never married
l = Bisexual never married

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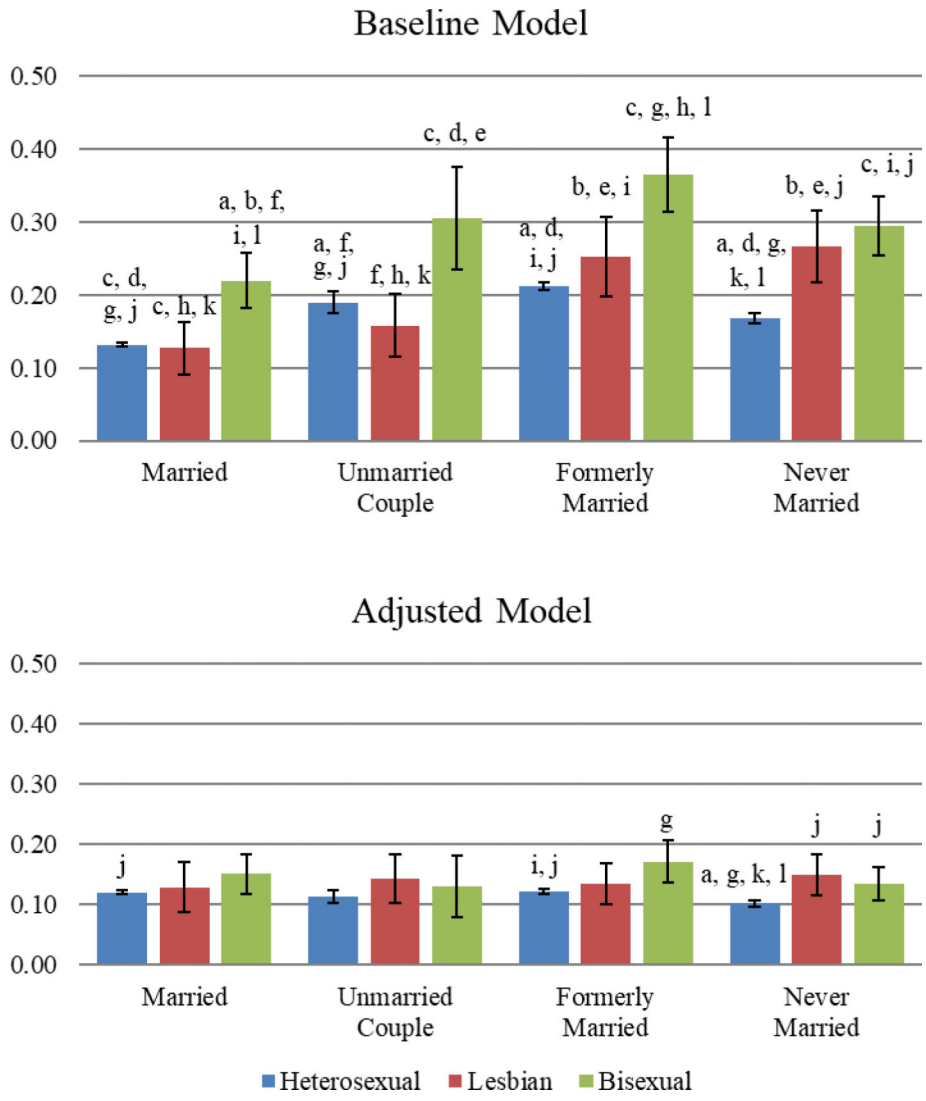

Figure 2: Predicted Probability of Poor-to-Fair Self-Rated Health Among Women

Notes: Baseline model adjusts for demographic controls (based on Model 1 of Appendix Table 3). Adjusted model includes demographic, socioeconomic, health behaviors, mental health, and marriage equality controls (based on Model 5 of Appendix Table 3). Columns represent the predicted probability of poor-to-fair self-rated health for each group. Letters above each column represent significant comparisons ($p<.05$) within sexual orientation group or within marital status group. Bars represent 95% confidence intervals.

a = Heterosexual married
b = Gay/lesbian married
c = Bisexual married
d = Heterosexual unmarried couple
e = Gay/lesbian unmarried couple
f = Bisexual unmarried couple
g = Heterosexual formerly married
h = Gay/lesbian formerly married

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i = Bisexual formerly married
j = Heterosexual never married
k = Gay/lesbian never married
l = Bisexual never married

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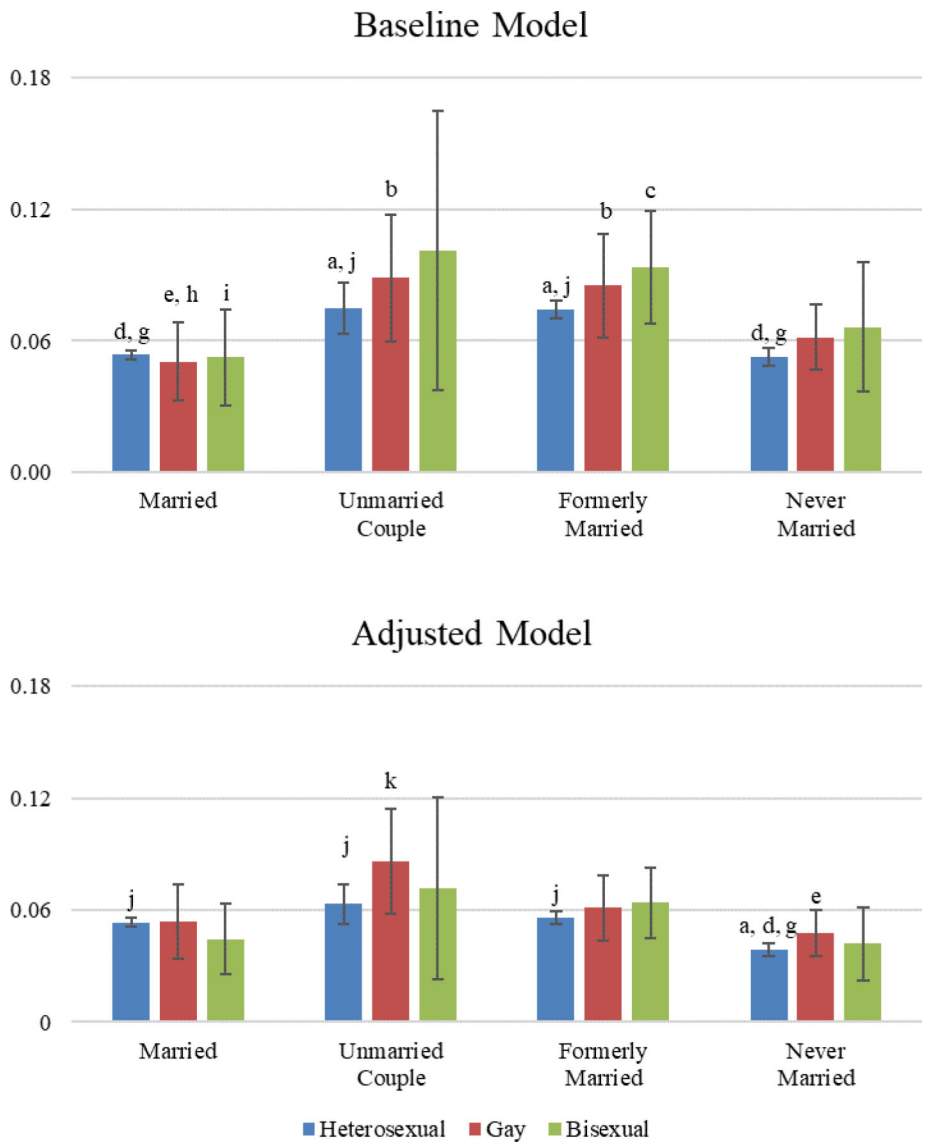

Figure 3: Predicted Probability of Cardiovascular Disease Among Men

Notes: Baseline model adjusts for demographic controls (based on Model 1 of Appendix Table 4). Adjusted model includes demographic, socioeconomic, health behaviors, mental health, and marriage equality controls (based on Model 5 of Appendix Table 4). Columns represent the predicted probability of poor-to-fair self-rated health for each group. Letters above each column represent significant comparisons ($p<.05$) within sexual orientation group or within marital status group. Bars represent 95% confidence intervals.

a = Heterosexual married
b = Gay/lesbian married
c = Bisexual married
d = Heterosexual unmarried couple
e = Gay/lesbian unmarried couple
f = Bisexual unmarried couple
g = Heterosexual formerly married

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h = Gay/lesbian formerly married
i = Bisexual formerly married
j = Heterosexual never married
k = Gay/lesbian never married
l = Bisexual never married

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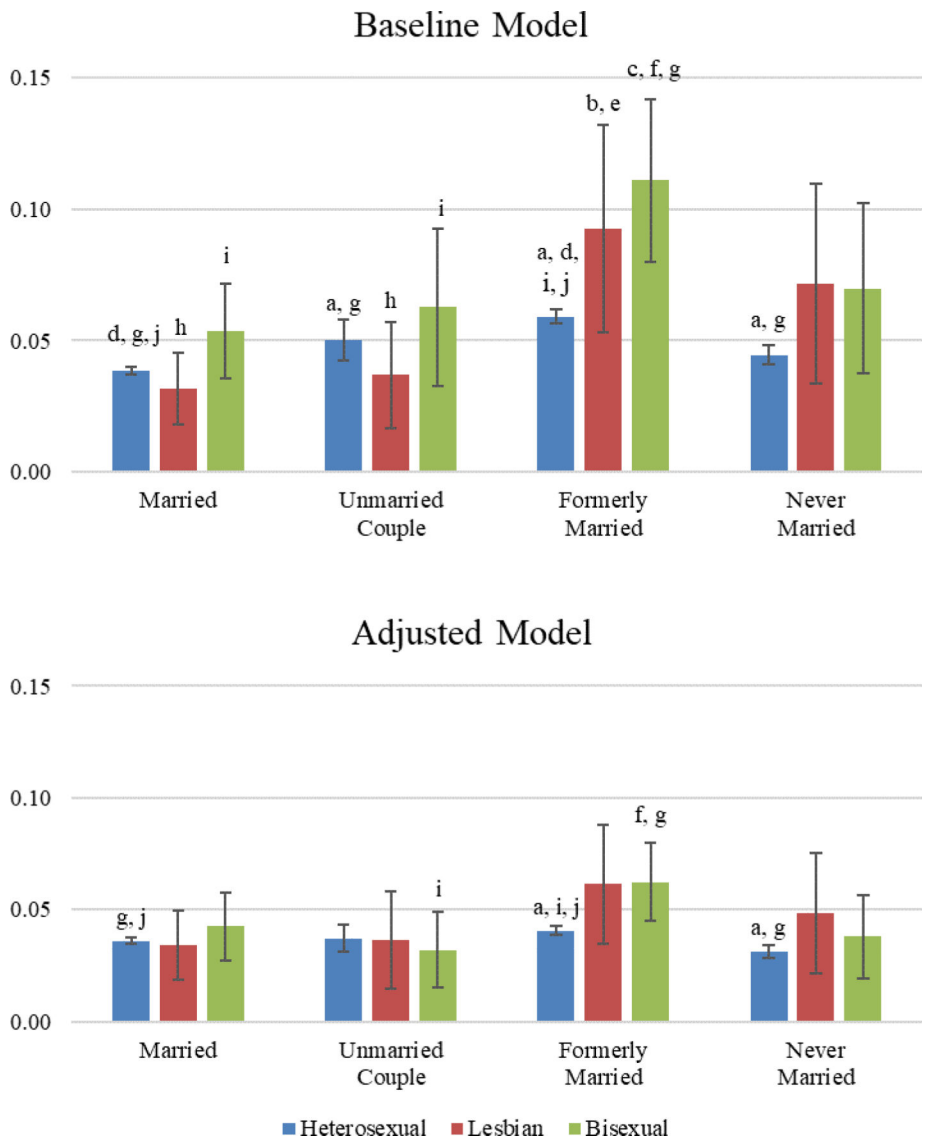

Figure 4: Predicted Probability of Cardiovascular Disease Among Women

Notes: Baseline model adjusts for demographic controls (based on Model 1 of Appendix Table 5). Adjusted model includes demographic, socioeconomic, health behaviors, mental health, and marriage equality controls (based on Model 5 of Appendix Table 5). Columns represent the predicted probability of poor-to-fair self-rated health for each group. Letters above each column represent significant comparisons ($p<.05$) within sexual orientation group or within marital status group. Bars represent 95% confidence intervals.

a = Heterosexual married
b = Gay/lesbian married
c = Bisexual married
d = Heterosexual unmarried couple
e = Gay/lesbian unmarried couple
f = Bisexual unmarried couple
g = Heterosexual formerly married

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h = Gay/lesbian formerly married
i = Bisexual formerly married
j = Heterosexual never married
k = Gay/lesbian never married
l = Bisexual never married

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Table 1

Sample characteristics, by sexual orientation and marital status among women and men

	Heterosexual				Gay/Lesbian				Bisexual			
	Married	**Unmarried Couple**	**Formerly Married**	**Never Married**	**Married**	**Unmarried Couple**	**Formerly Married**	**Never Married**	**Married**	**Unmarried Couple**	**Formerly Married**	**Never Married**
A. Women												
Age	50.3	35.6	60.2	31.9	47.4	45.4	50.0	36.1	39.7	30.7	45.0	26.5
	(14.3)	(15.5)	(13.3)	(17.8)	(13.3)	(13.2)	(13.8)	(16.8)	(15.4)	(13.8)	(17.2)	(14.2)
Race/ethnicity												
White	74.0	50.9	70.6	51.3	72.2	78.5	66.1	55.7	69.0	64.3	69.6	55.4
Black	5.0	6.5	11.5	18.8	5.7	4.7	9.3	17.2	4.3	6.1	9.2	17.3
Hispanic	13.2	37.3	12.0	18.5	11.3	7.4	9.5	18.6	14.7	17.9	12.2	16.0
Other	7.9	5.3	5.9	11.4	10.9	9.5	15.1	8.5	12.0	11.7	9.1	11.3
Number of children	0.9	1.2	0.5	0.7	0.8	0.5	0.6	0.5	1.1	0.8	0.8	0.7
	(1.2)	(1.2)	(0.7)	(1.0)	(1.0)	(0.8)	(0.9)	(0.7)	(1.2)	(1.1)	(1.0)	(1.01)
Education												
Less than high school	9.7	27.6	16.4	12.8	5.4	2.1	12.9	10.4	11.8	14.8	17.3	19.7
Completed grade 12 or GED	24.6	22.1	30.5	28.1	16.0	14.9	22.5	27.4	18.5	24.1	23.7	28.7
Some college	32.3	30.2	33.8	37.2	26.3	32.0	39.9	38.9	35.3	39.9	38.5	37.2
College and higher	33.4	20.0	19.3	21.9	52.3	51.0	24.7	23.2	34.4	21.2	20.5	14.4
Employed	53.5	51.6	38.4	52.5	67.2	67.4	55.4	54.8	56.4	47.5	45.3	44.5
Income												
<$25,000	15.7	47.5	51.2	45.6	14.2	17.9	45.1	46.2	27.4	47.4	60.0	56.7
$25,000–49,999	23.3	23.7	28.5	25.9	14.6	18.2	23.3	27.3	23.2	25.0	21.8	22.1
$50,000–74,999	18.7	11.3	10.6	12.5	14.8	15.5	11.3	9.8	15.5	10.7	9.2	7.0
$75,000+	42.3	17.5	9.7	16.1	56.4	48.4	20.3	16.7	33.9	16.9	9.0	14.2
Check-up in past year	73.6	62.1	77.5	67.6	71.7	68.9	73.2	64.1	64.8	52.9	68.4	62.8

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	Heterosexual				Gay/Lesbian				Bisexual			
	Married	**Unmarried Couple**	**Formerly Married**	**Never Married**	**Married**	**Unmarried Couple**	**Formerly Married**	**Never Married**	**Married**	**Unmarried Couple**	**Formerly Married**	**Never Married**
Exercised in past month	78.2	74.4	68.0	78.6	80.8	83.1	68.3	79.3	80.0	80.9	71.1	79.9
Overweight or obese	57.8	58.9	62.5	50.6	61.5	66.8	60.3	58.0	60.7	55.2	67.4	55.6
Current smoker	10.7	20.3	19.5	17.8	13.3	19.2	30.1	30.7	23.1	36.9	41.9	29.6
Days of poor mental health	3.3	4.8	5.0	5.1	4.3	5.5	7.0	7.6	7.2	10.9	9.7	9.0
	(6.9)	(8.4)	(8.7)	(8.6)	(7.5)	(8.3)	(9.8)	(9.9)	(9.8)	(10.7)	(11.4)	(10.3)
Marriage equality in state	54.8	51.2	55.6	56.7	60.2	43.7	45.7	51.8	60.6	56.2	56.5	64.5
Sample size	259,776	11,731	174,773	58,511	1,290	1,316	1,076	2,042	1,879	639	1,636	2,167
B. Men												
Age	51.9	36.1	55.6	30.9	50.4	46.2	53.7	38.7	53.3	34.9	53.0	31.5
	(14.5)	(15.9)	(13.6)	(16.9)	(13.4)	(13.2)	(13.0)	(16.8)	(15.9)	(14.8)	(14.9)	(18.6)
Race/ethnicity												
White	72.3	51.8	69.2	57.0	76.2	77.5	74.2	62.9	62.9	68.5	68.9	61.0
Black	6.2	7.5	12.3	11.9	3.6	6.9	9.6	9.3	3.9	5.0	10.9	11.6
Hispanic	13.5	35.1	12.7	19.5	9.8	12.1	10.5	19.0	12.5	18.9	14.7	13.3
Other	8.0	5.6	5.8	11.5	10.3	3.5	5.7	8.8	20.7	7.6	5.5	14.1
Number of children	0.9	1.0	0.4	0.5	0.3	0.1	0.3	0.2	0.6	0.8	0.4	0.3
	(1.1)	(1.15)	(0.7)	(0.8)	(0.8)	(0.5)	(0.6)	(0.5)	(1.0)	(1.1)	(0.7)	(0.7)
Education												
Less than high school	11.9	28.0	18.9	14.6	6.3	5.7	7.2	9.4	14.0	15.4	21.8	12.2
Completed grade 12 or GED	25.6	29.0	31.9	35.1	15.5	15.1	24.9	24.6	25.6	28.4	20.7	31.2
Some college	28.1	27.3	31.2	32.8	26.2	34.0	33.0	35.2	25.3	31.2	36.8	37.9
College and higher	34.3	15.7	18.0	17.5	52.0	45.1	35.0	30.8	35.0	25.1	20.6	18.7
Employed	68.2	74.1	50.1	58.6	69.2	70.2	53.8	56.8	61.5	74.6	47.2	53.7
Income												
<$25,000	13.8	40.3	41.2	39.7	9.5	15.9	37.7	35.8	23.4	38.4	49.6	42.3

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	Heterosexual				Gay/Lesbian				Bisexual			
	Married	**Unmarried Couple**	**Formerly Married**	**Never Married**	**Married**	**Unmarried Couple**	**Formerly Married**	**Never Married**	**Married**	**Unmarried Couple**	**Formerly Married**	**Never Married**
$25,000–49,999	22.6	26.6	29.0	26.9	14.7	19.9	26.3	25.6	21.2	21.5	23.5	25.1
$50,000–74,999	18.1	13.0	14.0	13.4	15.0	16.2	13.4	16.1	19.2	12.2	12.6	12.1
$75,000+	45.5	20.1	15.7	20.0	60.8	48.0	22.5	22.5	36.2	27.9	14.3	20.4
Check-up in past year	68.7	44.9	66.7	53.1	75.0	69.4	76.6	61.5	69.9	59.6	66.1	57.7
Exercised in past month	78.7	76.6	70.8	81.9	85.0	80.3	74.8	76.2	77.1	79.7	68.5	80.8
Overweight or obese	76.8	67.9	73.1	55.8	63.8	64.1	68.7	57.2	70.0	62.7	68.6	55.0
Current smoker	13.1	30.8	28.6	23.9	17.2	23.6	31.6	28.0	17.5	25.0	29.4	26.7
Days of poor mental health	2.3	3.9	4.4	3.8	3.1	5.2	6.4	5.4	4.5	9.3	6.4	7.2
	(5.9)	(7.7)	(8.6)	(7.8)	(6.7)	(7.5)	(10.0)	(8.7)	(8.0)	(10.3)	(9.5)	(9.7)
Marriage equality in state	54.8	50.1	56.1	56.1	66.6	43.3	53.8	50.8	61.9	60.2	59.9	59.6
Sample size	217,351	9,554	72,957	58,573	1,010	1,178	784	3,923	1,075	183	822	1,403

Note: Standard deviations are shown in parentheses.

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Table 2

Weighted percentages for self-rated health and cardiovascular disease, by sexual orientation and marital status among women and men

	Heterosexual				Gay/Lesbian				Bisexual			
	Married	**Unmarried Couple**	**Formerly Married**	**Never Married**	**Married**	**Unmarried Couple**	**Formerly Married**	**Never Married**	**Married**	**Unmarried Couple**	**Formerly Married**	**Never Married**
A. Women												
Poor-to-fair SRH	13.9	19.2	26.4	14.3	12.6	14.5	25.8	23.7	19.4	24.5	35.1	22.4
		+++	*+++*			***	*+++*	***, *+++*	***		***, *+++*	***
Cardiovascular disease	5.6	3.5	13.8	2.8	4.0	3.8	12.8	5.6	4.6	3.9	12.8	2.7
		+++	*+++*	*+++*			*+++*	**			*+++*	
B. Men												
Poor-to-fair SRH	14.7	18.0	26.7	13.2	11.3	15.4	22.5	16.9	17.9	25.1	30.1	20.2
		+++	*+++*	*+++*			*+++*	**, *+*			*++*	***
Cardiovascular disease	10.6	5.7	17.3	3.2	9.2	11.7	16.6	6.4	11.8	6.6	18.4	4.5
		+++	*+++*	*+++*		***	*++*	***			*+*	*+++*

Significance tests relative to heterosexual adults within same gender and marital status:

* $p < .05$

** $p < .01$

*** $p < .001$

Significance tests relative to marrieds within same gender and sexual orientation:

+ $p < .05$

++ $p < .01$

+++ $p < .001$