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## Suicidality and sexual orientation: Characteristics of symptom severity, disclosure, and timing across the life course

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### Abstract

This investigation explored suicide-related characteristics and help-seeking behavior by sexual orientation. Population-based data are from the California Quality of Life Surveys, which included 1,478 sexual minority (lesbian, gay, bisexual, and homosexually experienced individuals) and 3,465 heterosexual individuals. Bisexual women had nearly 6-fold increased risk of lifetime suicide attempts than heterosexual women (RR=5.88, 95% CI: 3.89–8.90), and homosexually experienced men had almost 7 times higher risk of lifetime suicide attempts than heterosexual men (RR=6.93, 95% CI: 3.65–13.15). Sexual minority men and women were more likely than heterosexual men and women to have disclosed suicide attempts to a medical professional (RR=1.48 and RR=1.44, respectively). Among persons who ever attempted suicide, sexual minority women had a younger age of index attempt than heterosexual women (15.9 versus 19.6 years of age, respectively). Health care professionals should be aware of suicidal risk heterogeneity among sexual minority individuals, including vulnerable points of risk and evidenced-based treatments.

### Keywords

mental disorders; gay; lesbian; bisexual; sexual minority; suicide

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## Introduction

Individuals reporting markers of sexual minority status, including histories of same-sex sexual partners (S. D. Cochran & Mays, 2000; de Graaf, Sandfort, & ten Have, 2006; Wichstrom & Hegna, 2003) or self-identification as lesbian, gay, or bisexual (LGB) (J. R. Blosnich & Bossarte, 2012; Russell & Joyner, 2001; Silenzio, Pena, Duberstein, Cerel, & Knox, 2007), are at greater risk than their heterosexual counterparts for suicidal ideation and suicide attempts. Despite the robust evidence for this association between sexual minority status and greater vulnerability for suicide ideation or attempts (Plöderl, et al., 2014), there remains several less-explored topics. This includes investigation of possible sexual orientation-linked differences in characteristics of suicidal symptomatology (e.g., age of attempt, severity of attempt). In addition, identifying with greater specificity the heterogeneity of risk within the sexual minority population could create more efficient use of screening and targeted prevention efforts in order to reduce suicide related morbidity and mortality in this vulnerable population.

One emerging question is whether the actual risk for suicide-related morbidity among sexual minority individuals is concentrated in adolescence and young adulthood, a time when many individuals are first developing a sense of their sexual orientation (Corliss, Cochran, Mays, Greenland, & Seeman, 2009; Paul, et al., 2002; Russell & Toomey, 2012). The majority of studies investigating sexual orientation differences in suicide attempt histories have used samples of adolescents and younger adults (J. R. Blosnich & Bossarte, 2012; Garofalo, Wolf, Wissow, Woods, & Goodman, 1999; Silenzio, et al., 2007). This age group, in general, is often identified as being most at risk for suicide attempts (R.C. Kessler, Berglund, Borges, Nock, & Wang, 2005). But even in studies of adults who vary in sexual orientation, there is some tentative evidence that excess suicide-related morbidity among sexual minorities may be concentrated during younger ages associated with timing of coming out (S. D. Cochran & Mays, 2000; Corliss, et al., 2009). Indeed, studies of sexual minority youth show that the process of coming out is a special time of stress and risk for suicide attempts (A. R. D'Augelli, et al., 2005; Anthony R D'Augelli, Grossman, & Starks, 2006; Dragowski, Halkitis, Grossman, & D'Augelli, 2011). Family rejection of a minority sexual orientation (Ryan, Huebner, Diaz, & Sanchez, 2009) and gender non-conformity have both been linked to suicidal behavior among sexual minority youth (Friedman, Koeske, Silvestre, Korr, & Sites, 2006; M Plöderl & Fartacek, 2009). Nevertheless, there is a lack of research investigating whether the increased lifetime risk in LGB adults is linked to adolescent development or if the elevated risk of suicidal behavior persists throughout the lifespan.

There has been minimal investigation into the heterogeneity of risk within different sexual minority subpopulations. To date, sample size limitations have forced the majority of studies to operationalize sexual orientation as a dichotomous construct (heterosexual vs. not heterosexual), although recent studies of psychiatric morbidity (S. D. Cochran, Mays, Alegria, Ortega, & Takeuchi, 2007), substance use (Drabble, Midanik, & Trocki, 2005; I. H. Meyer, Dietrich, & Schwartz, 2008), and personality disorders (Bolton & Sareen, 2011) have underscored the heterogeneity in prevalence of psychopathology among lesbians, gay men, and bisexuals (Matthews, Blosnich, Farmer, & Adams, 2013). For example, using data

from the National Epidemiologic Survey on Alcohol and Related Conditions, Bolton and Sareen reported that gay and bisexual men separately had similar elevated odds of suicide attempt when compared with heterosexual men. Conversely, when comparing lesbian and bisexual women separately with heterosexual women, bisexual women had much higher comparative odds than lesbian women (Bolton & Sareen, 2011). Consequently, disaggregation of sexual minorities at a minimum into homosexual and bisexual groups would greatly aid in targeting of interventions for specific subpopulations with the most risk.

Finally, the severity of suicide attempts among sexual minority populations is not well understood. Only a few studies have attempted to identify the severity of suicide-related morbidity in sexual minority persons who have attempted suicide (A. R. D'Augelli, et al., 2005; Jiang, Perry, & Hesser, 2010; Savin-Williams, 2001). Some studies have suggested that LGB individuals may have a higher propensity either for reporting suicide attempts or for construing self-harm behaviors as suicide attempts (A. R. D'Augelli, et al., 2005; Savin-Williams, 2001). If this is the case, this would have the effect of biasing estimated attempt rates upwards and exaggerating sexual orientation-related differences, but it is unclear whether this concern is valid. For example, Plöderl, Kralovec, and Fartacek found that sexual minority individuals were more likely to receive medical treatment for a suicide attempt and were more likely to report intentions to die than heterosexuals (M. Plöderl, Kralovec, & Fartacek, 2010). In addition, results from the Rhode Island Youth Risk Behavior Survey showed that sexual minority youth were more likely than heterosexual youth to report receiving medical attention for their attempts (Jiang, et al., 2010). Efforts to reconcile these differences are important in assisting primary care providers to better screen, identify and address serious mental illness and engage patients in health promoting behaviors to enhance psychological well-being.

In the present study, we use information available on self-reported suicidal ideation and suicide attempts from the second and third waves of the California Quality of Life Survey (Cal-QOL), a population-based mental health survey that over-sampled individuals with sexual minority orientation (Calzo, Antonucci, Mays, & Cochran, 2011). We use these data to investigate disaggregated sexual orientation-related differences in recent and lifetime reports of suicidal thoughts and attempts. We also stratify analyses by gender in order to investigate anticipated differences among men and women (M. K. Nock, et al., 2008). Based on existing literature (King, et al., 2008), we hypothesize that suicidal risk will be elevated in sexual minority individuals as compared to heterosexuals; particularly we hypothesize that bisexual individuals will have the greatest prevalence of suicidal ideation and attempt. In addition, we capitalize on the extensive assessment of suicide histories in the Cal-QOL to investigate possible sexual orientation-related differences in the timing and severity of these lifetime suicide attempts. For instance, we hypothesize that sexual minority men and women, on average, will report younger ages of index suicide attempt than their heterosexual peers.

## Methods

Data for the current study come from the 2008–2009 and 2012–2013 California Quality of Life Surveys (Cal-QOL II & Cal-QOL III), both of which were follow-back studies linked to

the 2007 and 2011–2012 California Health Interview Surveys (CHIS), respectively. Across the two CHIS surveys, more than 90,000 Californians, age 18 and older, were interviewed via random digit dialing (RDD) techniques. The CHIS interview was conducted in several languages with the majority of adult interviews completed in either English or Spanish (98%). Survey respondents were asked for permission to be recontacted for additional studies and those between 18 and 70 years of age were asked their sexual orientation identity and the genders of their sexual partners in the year prior to their participation. From 56,621 individuals meeting eligibility requirements for Cal-QOL participation, 9,238 individuals were selected for potential interview using stratified methods. In one stratum, all those who self-reported a sexual minority orientation or any same-sex partners in the year prior to interview were sampled with certainty ( $n = 2,562$ ). In a second stratum, 6,676 remaining eligible participants were selected proportional to their representation in the California population, with oversampling for African Americans. Out of 5,000 potentially eligible Cal-QOL II participants, 2,815 (57%) were successfully interviewed between August, 2008 and January, 2009, in either English or Spanish. Similarly, out of 4,238 potentially eligible Cal-QOL III participants, 2,449 (58%) were interviewed between January 2012 and February 2013 in either English or Spanish. In both waves, participants were administered a fully structured computer-assisted telephone interview (CATI) by trained interviewers. A small number of respondents ( $n = 321$ ) received a shortened version of the instrument that did not include the suicide symptom module and are excluded from the current study. This resulted in a final sample size of 4,943 for the combined datasets; respondents ranged from 18 to 72 years of age.

### **Suicide-related morbidity**

Suicidal ideation, attempts, and treatment seeking were assessed using an adaptation of the suicide module from the World Health Organization Composite Diagnostic Interview (WHO-CIDI) (R. C. Kessler, et al., 2004; R. C. Kessler & Ustun, 2004). CIDI-based questions, developed for face-to-face interviewing and flashcards, were modified to conform to requirements of a CATI-based instrument administered by telephone using minor wording changes drawn from the Canadian Community Health Survey - Mental Health and Well-Being (CCHS cycle 1.2)(Gravel & Béland, 2005). The Cal-QOL interviews assessed both lifetime and past 12 month occurrences of suicidal ideation. Also assessed were lifetime occurrences of suicide attempt. If any suicide attempt was reported, respondents were then asked their number of lifetime attempts and age at first attempt. Number of suicide attempts was top coded at four or more attempts. If there was more than one attempt reported, respondents were also asked their age at their last attempt. Duration of suicidal risk was estimated by calculating the number of years between age at first attempt and last attempt. For those individuals reporting a single attempt or identical ages for first and last attempt, the duration was estimated as 1 month for analytic reasons. Additional questions assessed whether respondents had ever received medical attention for any suicide attempt, including hospitalization, and whether they had ever disclosed any attempt to a doctor or other health professional.

## Individual characteristics

**Sexual orientation**—Individuals were asked their sexual orientation identity and the genders of their sexual partners since age 18 years. Using the sexual orientation identity question, we categorized individuals as self-identified lesbian/gay, bisexual, or heterosexual. Using the question about sexual partners since the age of 18, we examined any person who did not self-identify as LGB but reported any same-sex sexual partners since age 18 years. These individuals were classified as homosexually experienced women who have had sex with women (WSW) or men who have had sex with men (MSM) (Susan D Cochran & Mays, 2007), with approximately 97% explicitly identified as heterosexual. The final sample (n = 4,943) included 326 lesbian women, 310 bisexual women, 86 WSW, 1,854 exclusively heterosexual women, 549 gay men, 158 bisexual men, 49 MSM, and 1,611 exclusively heterosexual men.

**Demographics**—The Cal-QOLs also measured several demographic characteristics, including age, gender, race/ethnicity, educational attainment, relationship status, veteran status, nativity (U.S. born vs. foreign born), and annual family income. For analytic purposes, we recoded age into approximately ten year intervals; race/ethnicity into 4 groups (Hispanic/Latino, non-Hispanic white, non-Hispanic Black, and non-Hispanic other); educational attainment into four categories (high school degree or less, some college, college degree, and post-graduate studies); relationship status into two categories (currently married or cohabiting vs. not partnered); and family income into two groups (below 300% of year adjusted federal poverty limit vs. 300% or above).

**Current mental health status**—All respondents were administered the Kessler-10 (K-10) distress scale (R.C. Kessler, et al., 2002) assessing recent (past 30 days) psychological distress which we coded into 3 categories (none, mild, or moderate/severe) (Andrews & Slade, 2001) and the Composite International Diagnostic Interview Short Form (CIDI-SF) module for past year major depression (R.C. Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998). The CIDI-SF identifies individuals at high probability for meeting DSM-III-R criteria for major depression. Both the K-10 and CIDI-SF scales have been widely used in population-based surveys as brief and valid assessments of mental health (Ronald C Kessler, et al., 2003; Pez, et al., 2010).

## Statistical Analysis

Data were analyzed using SAS version 9.2 (SAS Institute, 2002–2008) (SAS Institute, 2010) and SUDAAN 11.0 (Research Triangle Institute, 2012). All analyses were weighted to adjust for selection probability, nonresponse and post-stratification to the California population. In the first set of analyses, we examined prevalence of demographic characteristics. To test for statistically significant differences among demographic characteristics and reduce the number of statistical tests conducted, we investigated associations between demographic characteristics and sexual orientation using sex-stratified multinomial logistic regression methods to regress sexual orientation on all demographic variables and survey cycle simultaneously. In the second set of analyses, we employed sex-stratified generalized linear model (GLM) methods using the binomial distribution and the link log function to estimate prevalence risk ratios (RRs) and 95% confidence intervals (CI)

comparing past 30 days distress, past year depression, lifetime and past 12 months prevalence of suicidal thoughts, and lifetime suicide attempts by sexual orientation (Spiegelman & Hertzmark, 2005). We report the point prevalence of each dependent variable as illustrative and did not conduct crude bivariate tests of prevalence, relying rather on the more rigorous multivariable results to evaluate statistical significance. Analyses were adjusted for survey cycle, age, race/ethnicity, educational attainment, relationship status, foreign birth, family income, and veteran status. All of these demographic characteristics have been previously shown to be associated with sexual orientation and suicidal behavior (John R. Blosnich, Bossarte, & Silenzio, 2012; S. D. Cochran, et al., 2007; M. K. Nock, et al., 2008; Pena, et al., 2008).

Finally, in the third set of analyses, we investigated possible sexual orientation-related differences in the characteristics of suicide symptoms among those reporting a positive history of at least one attempt. This included markers of the seriousness of attempts reported, number of attempts, age at first attempt, and duration between first and last attempts, again using sex-stratified GLM methods. Due to sample size limitations, all three sexual minority groups were collapsed into one group for these final analyses. Analyses were also adjusted for survey cycle, age, race/ethnicity, and foreign birth. In regards to multinomial and logistic regression analyses, we report prevalence RRs with their 95% CIs adjusted for possible demographic confounding. For multiple regression analyses, we report adjusted estimates of slope and their 95% CI's linking sexual orientation and the outcome of interest.

## Results

### Characteristics of the sample

Approximately 5.1% (CI: 4.6%–5.7%) of the weighted sample were classified as sexual minorities. Among women, 1.3% (CI: 1.1%–1.6%) identified as lesbian, 1.7% (CI: 1.4%–2.0%) as bisexual, and 2.4% (CI: 1.8%–3.2%) as WSW. Among men, 2.3% (CI: 2.0%–2.7%) identified as gay, 1.0% (CI: 0.7%–1.2%) as bisexual, and 1.5% (CI: 1.1%–2.2%) MSM. Among women, sexual orientation was significantly associated with age, race/ethnicity, foreign birth, educational attainment and relationship status (see Table 1). Among men, sexual orientation was similarly associated with age, race/ethnicity, educational attainment, and relationship status, but not foreign birth. In addition, gay and bisexual men were significantly less likely to be military veterans as compared to other men.

### Prevalence of mental health and suicide-related morbidity

Consistent with prior studies, (King, et al., 2008; Ilan H Meyer, 2003) minority sexual orientation was strongly related to both higher levels of past month depressive distress and past year prevalence of major depression (see Table 2).

**Women**—Although lesbians were no more likely than heterosexual women to evidence recent moderate or severe psychological distress, they were significantly more likely to meet criteria for past-year major depression (aRR=1.90, 95%CI: 1.25–2.89). Both bisexual

women and WSW, as compared to heterosexual women, were more likely to evidence both recent psychological distress and meet criteria for past year major depression.

Among women, 15.9% (CI: 14.1%–17.8%) reported positive lifetime histories of suicidal ideation and 5.1% (CI: 4.0%–6.3%) reported at least one suicide attempt at some point in the past. Lesbians and WSW were more than twice as likely and bisexual women more than three times as likely as heterosexual women to report lifetime serious suicidal ideation. This elevated risk was also observed in suicide attempts. Lesbians and WSW evidenced twice the risk of reporting a lifetime suicide attempt compared to heterosexual women. Bisexual women had a five-fold increase in risk of a lifetime suicide attempt when compared with heterosexual women. However, neither lesbians nor WSW evidenced higher risk of past-year suicidal ideation than heterosexual women. Nevertheless bisexual women were over 3.5 times more likely than heterosexual women to report past-year suicidal ideation.

**Men**—Levels of recent psychological distress were somewhat elevated for gay and bisexual men and MSM as compared to heterosexual men (see Table 3). For example, 15.1% of bisexual men reported moderate/severe distress in the past 30 days compared to 5.8% of heterosexual men. Further, risks for meeting criteria for past-year major depression were higher among gay men (aRR=1.65, 95% CI: 1.12–2.45) and MSM (aRR=2.87, 95% CI: 1.48–5.60) than heterosexual men.

Among all men, 15.4% (CI: 13.5%–17.4%) reported positive lifetime histories of suicidal ideation with 4.6% (CI: 3.6%–5.9%) reporting at least one suicide attempt. Similar elevated risks of suicidal symptoms associated with sexual minority status were seen among men as were evident among women. These positive reports were more common among sexual minority men as compared to heterosexual men. Gay men were 2.2 times, bisexual men 2.9 times and MSM 4 times more likely than heterosexual men to report positive lifetime histories of suicidal ideation. Similarly, gay men were 1.9 times, bisexual men 2.7 times and MSM nearly 7 times more likely than heterosexual men to have made at least one suicide attempt during their lifetimes. While gay and bisexual men did not have higher risks of past-year suicidal ideation, MSM had 7.8 times the risk of heterosexual men to report this past-year suicidal ideation.

### Characteristics of suicide attempts among attempters

Among persons who reported at least one lifetime suicide attempt, sexual minority individuals differed from heterosexual persons in terms of disclosure of an attempt to a medical provider and in age of first attempt (among women).

**Women**—Approximately 1/5 of sexual minority women who had ever attempted suicide reported that they experienced suicidal ideation in the past year, but this did not differ significantly from heterosexual women (Table 4). The number of attempts reported was also similar between sexual minority and heterosexual women. Many of these reported attempts were serious enough to receive medical treatment. Over 40% of sexual minority female attempters reported being hospitalized overnight for any attempt, a prevalence that was higher than (but not statistically different from) heterosexual women (32.5%). However, sexual minority women were significantly more likely to report having told a medical

professional about their attempt (aRR=1.44, 95% CI: 1.04–2.00). Although sexual minority women reported a significantly younger age of first suicide attempt than heterosexual women (15.9 years vs. 19.6 years,  $p=0.004$ ), they did not differ in the duration of time between first and last attempt.

**Men**—Somewhat similar findings were observed among men. One-third of sexual minority men who had ever attempted suicide reported suicidal ideation in the past year, and this did not differ significantly from past-year suicidal ideation reported by heterosexual men who had also ever attempted suicide. The number of attempts reported and whether any attempts were medically treated did not differ between sexual minority and heterosexual men. However, sexual minority men were significantly more likely than heterosexual men to report that they had told a medical professional about at least one attempt (aRR=1.48, 95% CI: 1.02–2.12). Unlike the difference observed among women in age at first attempt, there was no evidence of sexual orientation differences among men. Nor was there evidence of differences in age at last attempt or duration of time between first and last attempt among sexual minority and heterosexual men.

## Discussion

Estimates from the National Comorbidity Survey-Replication (NCS-R) suggest that about 14% of Americans will report having ever thought seriously about killing themselves and that about 4.5% will report that they have attempted suicide at some point in their lives (Cogle, Keough, Riccardi, & Sachs-Ericsson, 2009). In the current study, we observed rates similar to NCS estimates, with nearly 16% of the overall Cal-QOL sample reporting a history of suicidal ideation and 4.8% reporting an attempt. Further, we observed elevated risks of lifetime suicidal ideation and attempts among all sexual minority groups when compared to exclusively heterosexual women and men. This finding, too, is consistent with previous studies (King, et al., 2008), although the more extensive measurement of suicide-related symptoms in the Cal-QOLs provides greater clarity on suicide-related histories among sexual minority individual.

A critical question in the field is whether the excess suicide-related morbidity observed among lesbians, gay men, bisexuals and MSM/WSW is confined to younger ages when many sexual minority individuals are first learning how to navigate a stigmatized identity (Russell & Toomey, 2012). We noted somewhat mixed support for that perspective based on our present findings. For example, results from our analyses of the sub-group of suicide attempters revealed that sexual minority women had a significantly younger age of index attempt than heterosexual women. However, our findings among men who ever attempted suicide seem to contradict this view. The reported age at first attempt among sexual minority men ( $M=25.1$  years) did not differ significantly from heterosexual men ( $M=23.2$  years), and research suggests that this age (i.e., mid-twenties) is an age generally older than when most sexual minority men come out (Calzo, et al., 2011). To our knowledge, the only other study of differences in index age of suicide attempt was conducted among males only who were observed from adolescence through their late twenties (see Russell et al 2012). Here Russell et al. found that suicide-related behavior among sexual minority males occurred mostly in adolescence and not adulthood, although most of adulthood (the sample average age was 28



years) was not observed. Similar observations for women are not yet available. Although our findings among women are consistent with the observations of the Russell & Toomey (Russell & Toomey, 2012) study, our results among men are not. The discordance in findings among men may result from different operationalization of sexual minority status, as Russell & Toomey defined sexual minority status by same-sex romantic attraction. Additional studies are needed with longer follow-up to the ADD Health cohort and broader definitions of sexual minority status should be employed to clarify timing of suicide-related vulnerability in this high-risk population.

Our findings also extend understanding of attempt severity and help seeking behaviors associated with suicide in the sexual minority population. Although the difference between sexual minority and heterosexual attempters in suicide attempts requiring hospitalization was not statistically significant, nearly 60% of sexual minority men and just over 50% of sexual minority women attempters indicated receiving medical treatment for an attempt. Moreover, significantly greater proportions of sexual minority than heterosexual individuals reported telling a health professional about an attempt. Although the broader literature suggests that many individuals may report minor suicidal gestures as suicide attempts (R.C. Kessler, et al., 2005; M.K. Nock & Kessler, 2006), results from the current study, as well as from the National Comorbidity Survey (R. C. Kessler, Borges, & Walters, 1999), indicate that self-reported suicide attempts in health surveys likely represent a more serious subset of suicide attempts. Furthermore, some researchers suggest that sexual minority individuals have a lower threshold than heterosexuals for construing gestures as representing actual suicide attempts (Savin-Williams, 2001) (e.g., self-damaging behavior that does not result in injury or necessitate medical attention). Our results do not seem to support this assertion given that, among suicide attempters, there were no sexual orientation differences in several indicators of severity, such as the number of reported attempts, being medically treated for an attempt, or being hospitalized for any attempt. These similarities suggest that sexual minority individuals who report attempting suicide are, indeed, reporting serious attempts that rise to the level of formal medical treatment.

Our findings also raise additional treatment-related questions. Currently, the U.S. Preventive Services Task Force does not recommend screening for suicide risk in primary care (United States Preventive Services Task Force, 2014). Despite the lack of screening in healthcare settings for suicide-related risk (Feldman, et al., 2007; Ting, et al., 2012), 70% of sexual minority women and 78% of sexual minority men in the current study reported disclosing their suicide attempt to a medical professional. It is unclear whether healthcare providers are well-prepared for and able to respond to suicidal disclosures from patients. It is also unknown whether sexual minority individuals are referred to or access evidence-based treatments for suicidal behavior. Further research is needed to examine whether evidence-based treatments developed primarily with heterosexual populations are similarly efficacious in LGB populations. For example, studies of mental health interventions for other psychological problems demonstrate increased effectiveness when treatment regimens are culturally tailored for LGB populations (Jaffe, Shoptaw, Stein, Reback, & Rotheram-Fuller, 2007). Tailored treatment of suicide-related concerns that incorporates risk factors disproportionately experienced by LGB individuals (e.g., minority stress, stigma) may enhance effectiveness.

Some limitations in the current study warrant consideration. First, although representative of California, these results may not generalize to the United States as a whole, and the response rates (<60%) may have limited the representativeness of the sample. Second, participants retrospectively reported suicide-related events and feelings that may have occurred many years earlier; these reports are vulnerable to recall bias that could result in either under and overestimates of attempts. Third, the Cal-QOL interviews did not assess the severity of all reported attempts, only whether *any* attempt resulted in medical attention or hospitalization. Thus we are unable to estimate what proportion of reported attempts received medical care or assess other characteristics of attempt severity (e.g., an attempt resulting in injuries but the individual did not seek medical care). Fourth, because of the small number of individuals reporting any attempts, we could not provide estimates for sexual minority subgroups, and estimates from these particular analyses may be somewhat unstable due to limited statistical power. Fifth, our operationalization of WSW and MSM groups could not examine potential heterogeneity among these individuals, such as individuals who only had one same-sex sexual encounter since the age of 18 but who currently engage only in opposite-sex sexual relationships versus individuals who currently engage in same-sex sexual behavior but do not self-identify as LGB. Finally, we could not account for potential cohort effect factors that have occurred among sexual minority individuals and may have impacted mental health, such as the impact of AIDS deaths among a generation of gay men in the 1980s and 1990s (Rosenfeld, Bartlam, & Smith, 2012) or the shift in societal norms and acceptance LGB Americans have experienced (Martin & D'Augelli, 2009).

Among the many potential ways to improve the science about sexual orientation-related disparities in suicide risk, we focus on three in light of the findings. First, the inclusion of multiple domains of sexual orientation in federal health surveys can facilitate large sample sizes of respondents to gain evidence to confirm these findings and generate nationally representative estimates (Sell & Holliday, 2014). Second, suicide risk is a complex phenomenon that often is closely associated with social contextual factors (e.g., violence, stigma, rejection). Future research should strive to operationalize social determinants for more nuanced understanding of the modifiable risk factors contributing to sexual orientation-related suicide risk disparities, since sexual orientation, per se, is not construed as a causative factor for suicide. Third, research about resiliency among sexual minority populations continues to develop (Herrick, Stall, Goldhammer, Egan, & Mayer, 2014). Learning how sexual minority individuals negotiate and overcome periods of stress could play a crucial role in prevention and intervention development.

There are limited suicide prevention and intervention efforts for the LGB community at large (Haas et al., 2011), and our results highlight additional important considerations for intervention development. For example, sexual minority subpopulations with highest risk for current suicide-related morbidity (i.e., MSM and bisexual women) are also subpopulations least likely to be reached by interventions targeted specifically toward lesbians and gay men. For example, the MSM respondents in our study were men who did not self-identify as sexual minority, and may often not be involved in “gay spaces” where health prevention efforts may be aimed (Leibel, Lee, Goldstein, & Ranney, 2011). As we learned from HIV intervention research, homosexually-experienced men who do not identify as part of the gay

community are more difficult to reach through interventions targeted at gay and bisexual men (Goldbaum, et al., 1998; Rietmeijer, Wolitski, Fishbein, Corby, & Cohn, 1998; Siegel, Schrimshaw, Lekas, & Parsons, 2008). Similarly, we also observed a higher risk among bisexual women, who, although they self-identify as sexual minority, may also feel less connected to the visible lesbian/gay community (Balsam & Mohr, 2007). As interventionists begin to target reducing suicide risk among sexual minority populations, these heterogeneities of risk likely require artfully developed approaches to target effectively the highest risk individuals in this vulnerable population. Moreover, the relatively young ages of attempt among sexual minority populations, particularly among sexual minority women, further underscores early prevention and accessible intervention for suicide risk. For example, addressing modifiable risk factors within the social context of sexual minority youth, such as family acceptance (Ryan, et al., 2009) and school-based policies (Hatzenbuehler & Keyes, 2013) to prevent harassment and violence, are potential areas that could begin to address risk factors for self-directed violence.

A consensus group of experts convened by the American Foundation for Suicide Prevention, the Suicide Prevention Resource Center, and the Gay and Lesbian Medical Association highlighted the need for both training of LGB-identified mental health providers and development of suicide prevention interventions tailored for LGB individuals and communities (Haas, et al., 2011). Our study underscores that the majority of sexual minority individuals who have attempted suicide are likely to reveal these attempts to their medical providers. We need to ensure that the medical community is appropriately trained, informed about particularly vulnerable points of suicide risk by the scientific literature, and guided by evidenced-based approaches to effectively address suicide-related concerns raised by sexual minority individuals.

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**Table 1**  
 Respondent characteristics in California Quality of Life Surveys 2008–2009/2012–2013, by gender and sexual orientation

Characteristic	Women					Men		
	Lesbian (n=326) % (SE)	Bisexual (n=310) % (SE)	WSW <sup>1</sup> (n=86) % (SE)	Heterosexual (n=1,854) % (SE)	Gay (n=549) % (SE)	Bisexual (n=158) % (SE)	MSM <sup>1</sup> (n=49) % (SE)	Heterosexual (n=1,611) % (SE)
Age (M, SE) <sup>2,3</sup>	42.2 (1.4)	34.6 (0.9)	45.1 (1.8)	42.9 (0.4)	43.0 (0.9)	41.0 (1.9)	47.2 (3.2)	41.3 (0.4)
Race/ethnicity <sup>2,3</sup>								
White	65.2 (4.9)	58.9 (4.6)	70.9 (7.0)	48.8 (1.4)	64.5 (3.5)	54.9 (6.1)	76.3 (9.1)	51.6 (1.5)
Black	11.0 (3.3)	13.1 (3.3)	11.0 (3.1)	7.3 (0.5)	4.3 (1.7)	4.6 (1.8)	4.8 (2.4)	6.5 (0.5)
Hispanic	12.3 (3.4)	20.4 (4.0)	12.8 (6.2)	31.7 (1.3)	21.7 (3.2)	26.1 (5.5)	5.1 (4.2)	30.1 (1.4)
Other	11.5 (3.8)	7.7 (2.5)	5.4 (3.6)	12.1 (1.0)	9.5 (2.1)	14.5 (5.6)	13.8 (8.5)	11.8 (1.1)
Foreign born <sup>2</sup>	6.6 (2.3)	13.5 (3.3)	13.9 (5.5)	30.2 (1.3)	17.7 (2.7)	29.8 (6.0)	17.2 (8.0)	29.4 (1.4)
Education <sup>2,3</sup>								
High School	21.7 (4.5)	25.4 (3.9)	19.3 (6.3)	32.6 (1.3)	19.0 (3.1)	38.2 (5.9)	36.1 (9.9)	35.4 (1.4)
Some college	26.4 (4.3)	32.6 (4.4)	29.3 (6.9)	25.9 (1.2)	23.8 (2.8)	23.0 (5.1)	14.2 (6.0)	25.6 (1.3)
College degree	19.6 (3.3)	22.6 (3.8)	35.4 (7.4)	23.3 (1.2)	31.6 (3.2)	21.0 (4.8)	24.0 (8.8)	22.9 (1.2)
Post graduate	32.2 (4.3)	19.5 (3.5)	16.0 (5.5)	18.2 (1.0)	25.5 (2.7)	17.8 (4.4)	25.7 (8.9)	16.1 (1.0)
Married/cohabiting <sup>2,3</sup>	45.9 (4.7)	47.2 (4.6)	54.3 (7.6)	60.4 (1.3)	36.5 (3.3)	22.3 (4.7)	68.4 (8.5)	62.3 (1.4)
Family income <300%								
FPL	36.2 (5.0)	53.2 (4.5)	39.5 (7.6)	43.8 (1.4)	31.9 (3.3)	54.8 (5.8)	39.7 (9.7)	38.3 (1.5)
Military veteran <sup>3</sup>	3.1 (1.3)	2.3 (1.7)	2.2 (1.9)	1.6 (0.4)	9.5 (1.8)	9.4 (2.7)	26.6 (9.6)	14.3 (1.0)

Note: FPL=federal poverty level; weighted percentages, means, and standard errors (SE) shown

<sup>1</sup> MSM/WSW indicates homosexually-experienced individuals nearly all of whom identify as heterosexual.

<sup>2</sup> p<.05 in demographic characteristic among women in multinomial regression adjusted for survey cycle.

<sup>3</sup> p<.05 in demographic characteristic among men in multinomial regression adjusted for survey cycle

**Table 2**  
Prevalence and adjusted risk ratios of mental health indicators and suicide-related symptoms among women, by sexual orientation, California Quality of Life Surveys 2008–2009/2012–2013

	Lesbian		Bisexual		WSW <sup>1</sup>		Heterosexual <sup>2</sup>	
	% (SE)	aRR (95%CI)	% (SE)	aRR (95%CI)	% (SE)	aRR (95%CI)	% (SE)	aRR (95%CI)
<u>Mental Health Indicators</u>								
Past 30 days distress								
None	82.3 (3.7)	0.94 (0.86–1.04)	68.2 (4.3)	0.81 (0.72–0.90)*	72.4 (6.6)	0.83 (0.68–1.01)	84.8 (1.0)	
Mild	8.4 (2.7)	1.26 (0.91–1.74)	14.3 (3.0)	1.79 (1.48–2.18)*	11.7 (4.4)	1.71 (1.21–2.41)*	7.9 (0.7)	
Moderate/severe	9.2 (2.8)	1.48 (0.83–2.63)	17.4 (3.7)	2.53 (1.66–3.86)*	15.9 (5.5)	2.32 (1.17–4.59)*	7.2 (0.7)	
Past year major depression	24.2 (4.4)	1.90 (1.25–2.89)*	32.4 (4.3)	2.39 (1.74–3.28)*	35.3 (7.5)	2.88 (1.85–4.47)*	11.6 (0.9)	
<u>Suicide-related Symptoms</u>								
Past year suicidal ideation	3.9 (1.2)	1.03 (0.49–2.14)	14.1 (3.3)	3.86 (2.14–6.97)*	6.7 (3.8)	1.99 (0.67–5.90)	3.2 (0.5)	
Lifetime suicidal ideation	33.3 (4.5)	2.02 (1.49–2.75)*	48.5 (4.6)	3.07 (2.41–3.91)*	34.9 (7.3)	2.22 (1.41–3.48)*	14.6 (0.9)	
Lifetime suicide attempt	12.8 (3.2)	2.38 (1.33–4.26)*	28.4 (4.2)	5.88 (3.89–8.90)*	13.1 (4.5)	2.84 (1.37–5.87)*	4.3 (0.6)	

Note: Weighted percents and standard errors shown; all multivariable models adjusted for survey cycle, age, race/ethnicity, foreign birth, education, partnership status, family income, and veteran status. aRR = adjusted risk ratio.

<sup>1</sup>WSW indicates homosexually-experienced women nearly all of whom identify as heterosexual

<sup>2</sup>Referent category for multivariate analyses

\* p<0.05 in comparisons by sexual orientation (e.g., lesbian women vs. heterosexual women)



**Table 3**  
Prevalence and adjusted risk ratios of mental health indicators and suicide-related symptoms among men, by sexual orientation, California Quality of Life Surveys 2008–2009/2012–2013

Mental Health Indicators	Gay		Bisexual		MSM <sup>1</sup>		Heterosexual <sup>2</sup>	
	% (SE)	aRR (95%CI)	% (SE)	aRR (95%CI)	% (SE)	aRR (95%CI)	% (SE)	aRR (95%CI)
Past 30 days distress								
None	80.6 (2.8)	0.93 (0.86–1.01)	70.0 (5.8)	0.90 (0.81–1.00)	74.8 (8.6)	0.82 (0.64–1.06)	86.8 (1.0)	
Mild	11.2 (2.4)	1.37 (1.02–1.83)*	14.9 (4.3)	1.55 (1.12–2.15)*	10.5 (5.1)	1.88 (1.16–3.03)*	7.4 (0.8)	
Moderate/severe	8.2 (1.9)	1.41 (0.80–2.48)	15.1 (4.9)	1.65 (0.83–3.28)	14.7 (7.6)	2.70 (1.02–7.13)*	5.8 (0.7)	
Past year major depression	18.2 (2.7)	1.65 (1.12–2.45)*	12.6 (3.8)	1.00 (0.52–1.91)	24.8 (8.6)	2.87 (1.48–5.60)*	8.8 (0.8)	
Suicide-related Symptoms								
Past year suicidal ideation	7.1 (1.8)	1.67 (0.88–3.19)	7.2 (2.5)	1.43 (0.67–3.13)	30.8 (9.7)	7.81 (3.62–16.84)*	3.4 (0.5)	
Lifetime suicidal ideation	31.2 (3.0)	2.20 (1.70–2.84)*	43.8 (6.0)	2.94 (2.13–4.06)*	58.3 (9.6)	3.95 (2.72–5.74)*	14.1 (1.0)	
Lifetime suicide attempt	9.0 (1.5)	1.89 (1.18–3.05)*	14.2 (3.7)	2.70 (1.44–5.06)*	28.9 (9.7)	6.93 (3.65–13.15)*	4.0 (0.6)	

Note: Weighted percentages and standard errors shown; all multivariable models adjusted for survey year, age, race/ethnicity, foreign birth, education, partnership status, family income, and veteran status. aRR = adjusted risk ratio.

<sup>1</sup>MSW indicates homosexually-experienced men nearly all of whom identify as heterosexual.

<sup>2</sup>Referent category for multivariate analyses.

\* p<0.05 in comparisons gender by sexual orientation (e.g., gay men vs. heterosexual men)

**Table 4**

Characteristics of suicide attempt-related histories among individuals reporting at least one lifetime suicide attempt, by gender and sexual orientation, California Quality of Life Surveys 2008–2009/2012–2013

Characteristics of suicide symptoms	Women			Men			Estimated sexual orientation effect <sup>2</sup>
	Sexual Minority <sup>1</sup> (n=134)	Heterosexual (n=81)	Estimated sexual orientation effect <sup>2</sup>	Sexual Minority <sup>1</sup> (n=99)	Heterosexual (n=62)	Estimated sexual orientation effect <sup>2</sup>	
Markers of symptom severity	% (SE)	% (SE)	aRR (95%CI)	% (SE)	% (SE)	aRR (95%CI)	
Past 12 months ideation	20.3 (5.1)	13.9 (5.1)	1.54 (0.68, 3.47)	37.0 (12.0)	29.4 (6.6)	1.13 (0.50, 2.56)	
Number of lifetime attempts							
1	43.3 (7.5)	50.8 (6.7)	1.41 (0.59, 3.37)	56.9 (11.7)	52.9 (7.4)	0.47 (0.12, 1.77)	
2–3	39.6 (7.6)	34.9 (6.2)	1.00 (0.58, 1.72)	36.4 (11.6)	33.5 (7.0)	1.32 (0.73, 2.41)	
4 or more	17.1 (6.0)	14.3 (5.0)	0.89 (0.58, 1.38)	6.7 (2.9)	13.7 (4.8)	0.94 (0.60, 1.48)	
Ever medically treated for an attempt	51.8 (7.7)	56.0 (7.0)	0.83 (0.55, 1.27)	59.7 (12.3)	45.2 (7.1)	1.23 (0.69, 2.20)	
Ever hospitalized for any attempt	41.2 (7.4)	32.5 (6.1)	1.24 (0.78, 1.99)	51.2 (12.0)	29.7 (6.5)	1.66 (0.85, 3.22)	
Ever told medical provider about an attempt	70.4 (7.0)	45.0 (6.8)	1.44 (1.04, 2.00)*	77.9 (7.6)	48.3 (7.4)	1.48 (1.02, 2.12)*	
Timing of attempts	M (SE)	M (SE)	$\beta$ (95%CI)	M (SE)	M (SE)	$\beta$ (95%CI)	
Age first attempt, y	15.9 (0.7)	19.6 (0.7)	-2.73 (-4.59, -0.86)*	25.1 (3.3)	23.2 (1.6)	-2.83 (-9.93, 3.57)	
Age most recent attempt, y	19.6 (1.2)	23.5 (1.0)	-1.94 (-4.72, 0.84)	27.9 (3.1)	26.3 (1.5)	-2.73 (-9.46, 3.79)	
Duration between first and last attempts, y <sup>3</sup>	3.8 (0.8)	4.0 (1.0)	0.78 (-1.38, 2.94)	2.9 (0.9)	3.2 (0.9)	0.35 (-1.88, 2.58)	

Note: Weighted percentages, means, and standard errors shown. M= mean; SE = standard error; y = years.

<sup>1</sup> Sexual minority includes all with lesbian, gay, bisexual self-identification or reports of same-sex sexual partners (WSW/MSM).

<sup>2</sup> Sexual orientation effect evaluated separately by gender using multivariable logistic and multinomial (aRR= adjusted risk ratio for sexual orientation effect reported) or linear regression (adj.  $\beta$  = adjusted beta estimate for sexual orientation effect reported) models adjusted for survey year, age, race/ethnicity, foreign birth.

<sup>3</sup> If only one attempt was made or attempts occurred within the same reported age, duration was classified as 1 month.

\* =p<0.05