



Published in final edited form as:

*J LGBT Health Res.* 2007 ; 3(2): 25–36.

## Suicidal ideation and Attempts in North American School-Based Surveys:

### Are Bisexual Youth at Increasing Risk?

Elizabeth M. Saewyc, PhD, RN, PHN<sup>1,2</sup>, Carol L. Skay, PhD<sup>3</sup>, Patricia Hynds<sup>1</sup>, Sandra Pettingell, PhD<sup>3</sup>, Linda H. Bearinger, PhD, MS, RN<sup>3</sup>, Michael D. Resnick, PhD<sup>4</sup>, and Elizabeth Reis, MS<sup>5</sup>

<sup>1</sup>University of British Columbia School of Nursing, Vancouver, Canada

<sup>2</sup>McCreary Centre Society, Vancouver, Canada

<sup>3</sup>University of Minnesota School of Nursing, Minneapolis, USA

<sup>4</sup>University of Minnesota Medical School, Minneapolis, USA

<sup>5</sup>Public Health-Seattle & King County, Seattle, USA

### Abstract

This study explored the prevalence, disparity, and cohort trends in suicidality among bisexual teens vs. heterosexual and gay/lesbian peers in 9 population-based high school surveys in Canada and the U.S. Multivariate logistic regressions were used to calculate age-adjusted odds ratios separately by gender; 95% confidence intervals tested cohort trends where surveys were repeated over multiple years. Results showed remarkable consistency: bisexual youth reported higher odds of recent suicidal ideation and attempts vs. heterosexual peers, with increasing odds in most surveys over the past decade. Results compared to gay and lesbian peers were mixed, with varying gender differences in prevalence and disparity trends in the different regions.

### Keywords

Sexual orientation; Suicide attempts; Bisexual; Gay; Lesbian; Adolescents; Population Surveys; School-based Surveys; Health Disparities

---

Suicide is the second leading cause of death among adolescents in Canada and the third leading cause of death among adolescents in the United States. More than 1700 adolescents aged 15 to 19 commit suicide each year in Canada and the United States (Public Health Agency of Canada, 2003; National Vital Statistics, 2005). Because research has shown that one of the stronger predictors of completed suicide is a previous suicide attempt (van Heeringen & Vincke, 2000), identifying sub-groups of adolescents at greater risk for suicide attempts can help direct intervention efforts.

Studies from around the world have found that gay, lesbian and bisexual (GLB) youth are at a significantly higher risk for suicidal ideation and attempts than their heterosexual peers. This increased risk has been documented in the Midwest (Remafedi, French, Story, Resnick & Blum, 1998) and East coast of the United States (Faulker & Cranston, 1998), as well as in New

Zealand (Fergusson, Horwood & Beautrais, 1999; Skegg, Nada-Raja, Dickson, Paul & Williams, 2003), Norway (Wichstrom & Hegna, 2003), Guam (Pinhey & Millman, 2004), and Turkey (Eskin, Kaynak-Demir & Demir, 2005). In the National Longitudinal Survey of Adolescent Health, a national probability sample of U.S. high school students, Russell and Joyner (2001) found that youth with same-sex attractions were more than twice as likely as those with only opposite-sex attractions to attempt suicide. These findings are not limited to adolescents; a national survey of adults in the U.S. also found men with same-gender sexual experience were more than five times as likely as men who reported having sexual experiences exclusively with women to have attempted suicide in their lifetime (Cochran & Mays, 2000).

Some experts estimate that the risk of suicidal behaviour faced by GLB youth is two to eight times greater than by heterosexual peers (Bagley & Tremblay, 2000). Generally, this increased risk is found among both boys and girls (Saewyc, Bearinger, Heinz, Blum, Resnick, 1998) but some studies have reported significant gender disparities (Pinhey et al., 2004; Wichstrom et al., 2003). A thorough review of the existing literature has previously been reported by D'Augelli, Hershberger and Pilkington (2001), and they concluded that GLB youth are at disproportionately higher risk for suicidality, but further exploration was needed into gender differences and the theorized pathways linking sexual orientation to suicidality. These studies, especially those using population-based samples, are compelling, but they do not include data from Canada, or the West coast of the United States, where ethnic distribution and cultural differences in attitudes about sexual orientation may alter the disparities identified elsewhere. Further, none of the studies reported to date have included data from the same region across different year cohorts, to identify changing trends over time.

As well, the majority of the studies have combined adolescents with gay/lesbian and bisexual orientations, or same-gender and both-gender attractions or behaviors, into a single category. Because population-based studies tend to include a higher proportion of bisexual youth than gay or lesbian youth (Remafedi, Resnick, Blum & Harris, 1992; Russell, 2005; Saewyc, Skay, Bearinger, Blum & Resnick, 1998) the results of studies that combine samples of GLB youth may disproportionately represent the experiences of bisexual youth. The few studies that have reported results specifically for bisexual youth separately from gay and lesbian teens suggest bisexual adolescents may be at an elevated risk for suicidality compared to their gay, lesbian and heterosexual peers. In their population-based sample of Vermont and Massachusetts high school students in 1997, for example, Robin and colleagues found that students who reported having sexual contact with both genders were significantly more likely to have made a suicide attempt that required medical attention in the preceding twelve months than their peers who reported exclusively opposite- or exclusively same-gender sexual contact (Robin, Brener, Donahue, Hack, Hale, & Goodenow, 2002). Similarly, in the Urban Men's Health Study of several cities across the U.S., Paul and colleagues found bisexual men were more likely than gay and heterosexual men to report planning and carrying out a suicide attempt (Paul et al., 2002). Of those who attempted suicide, bisexual men made more attempts, and a first attempt was more likely to occur before the age of 25. In their study of a convenience sample of 194 sexual minority youth, Hershberger, Pilkington & D'Augelli (1997) found that self-identified bisexual youth were more than five times as likely as gay or lesbian youth to attempt suicide more than once during their lifetime.

One of the theorized explanations for this association between sexual minority orientation and suicidality is exposure to increased social stigma, victimization and harassment. While a number of studies have documented greater harassment and victimization for gay, lesbian and bisexual adolescents (Russell, Franz & Driscoll 2001), some of the research has found bisexual youth may be more likely even than gay or lesbian peers to suffer from harassment at school (Robin, Brener, Donahue, et al., 2002; Saewyc, Singh, Reis & Flynn, 2000) and that youth who report higher levels of harassment also report higher levels of risky behaviours, including

suicide attempts (Saewyc, et al., 2000; Russell & Joyner, 2001, Goodenow, Szalacha, & Westheimer, 2006). Identifying with and being accepted by a community of peers may reduce stress and increase social support for adolescents as they develop their sexual identities. For bisexual youth, who may not feel as if they “fit in” with either their heterosexual or gay and lesbian peers, the effects of stigma may be compounded. For youth in school, having supportive school personnel and policies addressing anti-gay harassment may reduce both the amount of victimization and the odds of suicide involvement (Goodenow, Szalacha & Westheimer, 2006; Eisenberg & Resnick, 2006). A related explanation is that internalized homophobia is partially responsible for higher levels of depression, which predicts higher suicidality in GLB youth (Igartua, Gill & Montoro, 2003).

School environments are not the only source of support and rejection that may influence adolescents’ odds of suicide involvement, of course. Family environments have an important role in adolescent development, and researchers have also theorized that actual or expected parental and familial reactions to youths’ disclosures of their sexual identity may also play a role. It has been shown that the period of time when a young person discloses to family is when the risk of suicidality is particularly high (D’Augelli et. al., 2001; Igartua et. al., 2003). Similarly, a recent study has found strong family connectedness reduces the odds of suicide attempts among youth with recent same-gender or both-gender sexual partners (Eisenberg & Resnick, 2006).

To date, there have been no reported epidemiological studies tracking trends in suicide attempts among sexual minority populations. Since the experiences of sexual minority people have gained greater visibility in the North American mainstream media over recent years, one could expect stigma to have decreased, and likewise the risk of suicidal involvement for these young people. However, it is equally possible that this improved visibility could have increased anxiety and hostility among people and groups who hold negative attitudes and beliefs about sexual minority orientations. This increased anxiety could have spurred a “backlash” of hostile responses that may have actually created a more violent and overtly negative social environment for sexual minority youth. Political efforts in the United States and Canada to prevent further extension of basic rights for sexual minority people, and to repeal existing protections, tend to suggest a backlash is occurring, as do increasing rates of orientation-motivated hate crimes that have been documented in the U.S. in recent years (Federal Bureau of Investigations, 2004). Understanding changes in population risks over time can help identify the influences of changes in social climates, policies, and laws at the local, national, and international level.

## Purpose

As part of a larger study of bisexual youth health disparities, this study examined the potential disparity in suicidal ideation and attempts by orientation among students in several school-based surveys in Canada and the United States. We chose to focus our analysis on the risk of suicidality specifically among youth with a bisexual orientation, whether that orientation was measured by self-identity, romantic or sexual attraction to both genders, or both-gender sexual experience, and compare these adolescents to their heterosexual, mostly heterosexual, and gay or lesbian peers in these surveys. Based on the literature, we hypothesized that bisexual youth would face the highest risk of suicidal ideation and attempts compared to their gay, lesbian and heterosexual peers.

Because the surveys we used were gathered at different points in time over a seventeen-year period, and most of the surveys were repeated at least twice in the same regions, we also examined changes in disparities of suicidal ideation and attempts for bisexual youth where

possible. Given these potential competing social trends of greater visibility but potential backlash, we could not generate a directional hypothesis as to possible trends.

In summary, we sought to explore, separately by gender, the link between sexual orientation and suicidality in several distinct school-based populations across time. We hypothesized that (1) bisexual youth would be more likely than their peers to think about or attempt suicide and (2) that the strength of this association would change over time. Monitoring trends for this specific sub-group of youth, who may be especially vulnerable to suicidal involvement, can aid efforts to reduce a leading cause of death among youth in North America.

## Methods

The present study is a secondary analysis of 9 large-scale school-based surveys, administered to students in four geographic regions and one national survey in two countries between 1986 and 2003: the Minnesota Adolescent Health Survey of 1986 (MAHS86), plus the Minnesota Student Surveys of 1992 and 1998 (MN92 and MN98); the Seattle Adolescent Health Surveys of 1995 and 1999 (SE95 and SE99); the British Columbia Adolescent Health Surveys of 1992, 1998 and 2003 (BC92, BC98, BC03); and the National American Indian Adolescent Health Survey of 1990 (AI90), a survey of reservation-based schools in 10 of the 12 Indian Health Service Regions across the U.S.

Sexual orientation was measured in each survey by responses based either on gender of sexual partners in the past year (MN92, MN98), on a three-category self-identification with attraction definitions (SE95, SE99), or on a 5-category self-identification with attraction definitions (all other surveys). For example, in the Seattle surveys, the question asked whether students identified as “heterosexual--attracted to the opposite sex,” “bisexual--attracted to both sexes” “homosexual (gay or lesbian)—attracted to same sex” or “not sure.” The measures in MN92 and MN98 only ask about gender of sexual partners in the past 12 months, which means only recently sexually active adolescents are included; this is a weaker measure of orientation than the other surveys (Saewyc, Bauer, Skay, et al., 2004) but is the only one available in these cohorts during these years. In the MAHS86, AI90, and all three surveys from BC, respondents could choose “100% heterosexual (attracted to persons of the opposite sex),” “mostly heterosexual,” “bisexual (attracted to both males and females)” “mostly homosexual,” “100% homosexual (“gay/lesbian”; attracted to persons of the same sex),” or “Not sure.” Due to sample sizes and similarities of response, the mostly homosexual and 100% homosexual were combined in surveys where these were response options; however, the “mostly heterosexual” group was both larger than bisexual and gay/lesbian categories (ranging from 4% to 11%), and distinctly different from either 100% heterosexual or bisexual respondents in many of their demographic responses, so they are kept as a separate category. Unsure students and those who did not respond were excluded from the analysis. An in-depth analysis of unsure and missing responses and the specific wording of sexual orientation measures for all these surveys have been reported elsewhere (Saewyc, Bauer, Skay, et al., 2004).

For ease in presentation of these analyses, the groups are identified by four categories, regardless of type of measure (heterosexual, mostly heterosexual, bisexual, and gay or lesbian). However, since the original survey items do not capture equivalent orientation groups in every region, comparisons across regions should not be made (Saewyc, Bauer, Skay, et al., 2004). Table 1 describes the survey sampling methods, sample size, and brief demographic information.

All surveys measured suicidal ideation and attempts with the same two items. We used cross-tabulations to identify the prevalence of ideation and attempts, separately by gender, within each orientation group. Using logistic regression, we then calculated age-adjusted odds ratios

of recent suicide attempts, within each gender, for bisexual teens compared to each of the other orientations. Trends in disparity of adjusted suicide risk were tested using 95% confidence intervals of the adjusted odds ratios across surveys from the same regions.

We controlled for age in analyses, because of differing mean age among the orientation groups. Although studies have identified different rates of suicide attempts among different racial and ethnic groups in the U.S. and Canada, we did not control for ethnicity or race in these analyses for three reasons. First, in the BC surveys, the items assessing racial or ethnic background changed in each survey, and are not equivalent to the categories most often provided in U.S. surveys. As well, in Minnesota and BC surveys, respondents could choose more than one category of ethnicity, making it difficult to create useful groupings. Second, race or ethnicity are only loose proxies of cultural differences, or acculturation; for example, a student in BC may be a 7<sup>th</sup> generation Chinese whose family has lived in Vancouver since the 1800s, or may have just immigrated from Hong Kong after 1997, and these two would be included in the same ethnic category. The surveys do not have consistently similar or adequate measures of acculturation to control for that heterogeneity within ethnic categories. Finally, there is evidence that nearly all of the different ethnic groups within the school surveys have a history of negative attitudes and discrimination toward sexual minority orientations, and higher suicide attempt rates among sexual minority adolescents or young adults have been documented among populations in Europe (Wichstrom & Hegna, 2003; van Heeringen & Vincke, 2000), in Turkey (Eskin, Kaynak-Demir, & Demir, 2005), among European and Pacific Island populations such as found in New Zealand (Skegg et al., 2003; Fergusson et al., 1999); among Asian student populations outside of North America (Pinhey & Millman, 2004) as well as in the U.S. (Dawady, 2004;) and among multiple ethnic minority groups in the U.S. (Borowsky, Ireland & Resnick, 2001; Eisenberg & Resnick, 2006). Thus, ethnic background is unlikely to be a strong confounder for differences in suicide attempts by sexual orientation.

## Results

As shown in Table 1, two to six percent of youth in each survey indicated a gay, lesbian or bisexual orientation. Tables 2 and 3 describe the prevalence and age-adjusted odds ratios for suicidal ideation, while Tables 4 and 5 show the prevalence and age-adjusted odds ratios of suicide attempts. For both genders, the prevalence of suicidal ideation was generally higher than the prevalence of attempts. In each survey, heterosexual boys reported the lowest rates of suicidal ideation and attempts, and the prevalence of ideation and attempts among heterosexual girls was nearly twice that of heterosexual boys. In every survey except for AI90 girls, the prevalence of ideation and attempts among gay, lesbian and bisexual youth were higher than for heterosexual youth. It should be noted that differences in prevalence between regions may be due to the different sampling methods and age ranges of participants in surveys of the different regions, and so should not be compared directly.

### Suicidal Ideation

In half of the surveys, lesbian and bisexual girls reported a higher prevalence of suicidal ideation than gay and bisexual boys, and in 6 of the 9 surveys, bisexual girls reported a higher prevalence of suicidal ideation than bisexual boys (all except SE99, BC92, AI90). Suicidal ideation was reported by up to 73% of bisexual and 71% of lesbian girls, compared to 55% of heterosexual girls and 35% of mostly heterosexual girls in surveys with that category. Among boys, nearly 2 in 3 bisexual and gay boys reported suicidal ideation, compared to 1 in 3 heterosexual boys, and even lower prevalence for mostly heterosexual boys. In most surveys, bisexual boys reported significantly higher age-adjusted odds of suicidal ideation than heterosexual and mostly heterosexual boys, but varied compared to gay boys. For girls, in all but the three oldest surveys, bisexual girls reported significantly higher age-adjusted odds of

suicidal thoughts than heterosexual and mostly heterosexual girls. Bisexual girls had either similar odds or lower odds of suicidal ideation than same-aged lesbian girls in the same survey.

### **Suicide Attempts**

In most of the surveys, lesbian, gay, and bisexual youth reported higher rates of suicide attempts than heterosexual peers in that survey. In all but 1 of the 9 surveys, bisexual girls reported a higher prevalence of suicide attempts than bisexual boys (SE99). However, unlike all the other surveys, bisexual boys and girls in the National American Indian Adolescent Health Survey of 1990 were no more likely than heterosexual, gay or lesbian youth to attempt suicide. Among the other 8 surveys, bisexual girls were up to 5.2 times more likely to attempt suicide than same-age heterosexual and mostly heterosexual girls, and in earlier surveys, also more likely to report suicide attempts than lesbian girls. Bisexual boys were between 1.8 and 12.5 times more likely than same-age heterosexual and mostly heterosexual boys to attempt suicide, and in MN98 and BC03, they were slightly more likely to attempt suicide than gay boys as well.

### **American Indian Adolescents**

Unlike the other surveys, among students in the national survey of reservation-based American Indian adolescents, there were few significant differences by orientation in suicidal thinking and no differences in the prevalence of suicide attempts. In AI90, bisexual boys were twice as likely as their heterosexual and mostly heterosexual age-mates to report suicidal ideation. There were no differences for girls, and no differences in suicide attempts for boys or girls; this appears to be primarily due to equally high rates of suicide attempts among heterosexual American Indian students, which are generally higher than among heterosexual students in other surveys.

### **Gay and Lesbian vs. Heterosexual Comparisons**

Given the small and varied differences in suicidal ideation and attempts between bisexual students and their lesbian and gay counterparts, lesbian and gay students also report higher odds of suicide ideation and attempts compared to their heterosexual peers in most surveys (data not shown). The only exceptions were for lesbian vs. heterosexual girls in earlier surveys from Minnesota, where suicidal ideation was not significantly higher in MAHS86, and suicide attempts were not significantly higher in MN92.

### **Trends over Time**

In British Columbia, Seattle, and Minnesota, the same survey using the same sampling strategy were conducted in multiple years, providing an opportunity to compare cohorts across time. In BC there are three cohorts, allowing true trends, while Minnesota and Seattle only have two time points for comparison. Nevertheless, comparisons of cohorts from earlier and later in the 1990's can be useful, especially when included with the trends of other surveys.

For British Columbia, the age-adjusted odds of suicidal ideation among bisexual boys compared to their heterosexual peers more than doubled, from 1992 to 1998 (AORs 2.1 to 4.8) then was not significantly higher in 2003. Among bisexual girls, the adjusted odds of suicidal ideation compared to heterosexual girls nearly doubled in each successive survey, from 1992 (AOR= 0.9) to 1998 (AOR=2.7) to 2003 (AOR= 4.7). The gap in suicidal ideation risk among bisexual vs. mostly heterosexual girls also increased in BC, the only surveys with that measure and multiple cohorts.

The disparity in suicide attempts between BC bisexual and heterosexual boys widened between 1992 and 1998, but narrowed in 2003, although bisexual boys were still 4.4 times more likely to report suicide attempts than heterosexual peers the same age. The disparity in suicide

attempts between bisexual and mostly heterosexual boys also declined with each BC survey. However, the odds of suicide attempt among bisexual girls vs. heterosexual and mostly heterosexual girls rose significantly in each successive survey. These increases appear to be due in part to unchanged or declining rates of suicide attempts among heterosexual youth, with concurrent rising rates of attempts among bisexual youth.

Comparing British Columbia bisexual vs. gay boys' adjusted odds of suicide attempts revealed an unexpected trend. Bisexual boys were at a lower risk for suicide attempts than gay peers in 1992, but the gap narrowed in 1998, and their risk surpassed that of gay boys in 2003. While bisexual boys in British Columbia faced an increasing likelihood of both suicidal ideation and suicide attempts compared to gay peers, for bisexual vs. lesbian girls, there was a reverse trend for suicide attempts, with higher odds for bisexual girls in 1992, no differences in 1998, and lower odds for bisexual girls in 2003.

In Minnesota, the likelihood of suicide attempt among bisexual boys and girls compared to their heterosexual peers significantly increased from 1992 to 1998. Compared to gay and lesbian same age peers, Minnesota bisexual boys showed increasing odds of suicide attempts in later years, while bisexual girls showed decreasing odds compared to lesbian girls. Trends were not apparent for suicidal ideation among either boys or girls in Minnesota, except for rising odds of suicidal ideation for bisexual vs. gay boys in 1998 compared to 1992.

In Seattle, the disparity in suicidal ideation and attempts among bisexual vs. heterosexual boys appeared to increase dramatically from 1995 to 1999, but wide and overlapping confidence intervals suggest such trends should be viewed with caution. Bisexual boys were around three times more likely than heterosexual boys to think about suicide in 1995 and ten times more likely in 1999, but the 95% confidence intervals overlapped, indicating no significant difference in the odds. Similarly, bisexual boys had nearly 6 times the odds of heterosexual boys their age to attempt suicide in 1995, and almost 13 times the odds in 1999, but also with overlapping confidence intervals. Likewise, there were no significant differences in age-adjusted odds ratios for bisexual vs. heterosexual girls in Seattle, for either suicidal ideation or attempts, and no differences between bisexual and gay or lesbian peers at all.

## Discussion

In examining 8 population-based datasets of adolescent students from the Midwestern U.S. and the Pacific Northwest of the U.S. and Canada from the 1980s, the 1990s, and in the new millennium, and 1 national survey of American Indian adolescents in 1990, we found that, despite differing measures of sexual orientation and sampling strategies, gay, lesbian and bisexual youth were at a significantly increased risk of suicidal ideation and attempt compared to their heterosexual and mostly heterosexual peers in nearly all surveys. Sometimes, bisexual youth were also more likely than gay or lesbian youth to consider or attempt suicide, but more often both bisexual and lesbian/gay teens were at similar risk. In most surveys, nearly one-fourth to one-third of sexual minority youth reported suicide attempts, compared to approximately one-tenth or fewer heterosexual peers. Of concern, the disparity in suicide attempts compared to heterosexual and mostly heterosexual peers remains in surveys throughout the 1990s and into the new century, and in fact, appears to be widening for bisexual girls in British Columbia and Minnesota, and for bisexual boys in Minnesota, and possibly in Seattle. Bisexual boys in BC and Minnesota were also increasingly more likely to report suicide attempts vs. their gay peers, while lesbian girls showed increasing odds of attempts in both these regions compared to bisexual girls.

It is important to recognize that we cannot determine from these data the reason sexual minority youth are at greater risk of suicidal involvement than their heterosexual peers, because the

surveys do not ask about why teens attempted suicide. Similarly, because sexual orientation develops during adolescence, and these surveys are cross-sectional, not all adolescents who will identify as gay, lesbian or bisexual have done so in these surveys. It is possible that some of the suicidal heterosexual or mostly heterosexual teens are actually in the process of identifying as gay or bisexual but have not yet disclosed this, and so the disparity would actually be even higher. It is equally possible that non-suicidal heterosexually-attracted or identified teens may eventually identify as gay, lesbian or bisexual in later grades or during young adulthood, thus attenuating the disparities we have found between sexual minority and heterosexual youth. However, despite higher risk of suicide for sexual minority youth, it is not a universal risk: in most of the surveys, fewer than half of GLB youth reported either suicidal ideation or attempts.

It is interesting to note only the American Indian survey did not find disparities in suicidal ideation or attempts among sexual orientation groups. Previous studies of sexual minority youth using this dataset also found no difference in teen pregnancy rates by orientation, and higher prevalence of sexual minority and unsure adolescents among American Indian youth (Saewyc, Skay, Bearinger, et al., 1998a & 1998b). We suggested in those studies that cultural traditions of positive non-heterosexual roles among many American Indian tribes may have resulted in lower stigma for sexual minority American Indian adolescents on reservations, thus lowering their risk for poorer health outcomes compared to heterosexual peers. High and troubling rates of suicide attempts among American Indian youth, regardless of orientation, may be due to community-wide experiences of historical trauma and current racism that create ongoing survival risks for Native adolescents, especially women (Walters & Simoni, 2002).

These analyses also cannot explain the worsening trends in the disparity in suicide attempts, especially for bisexual girls and boys compared to heterosexual peers. Further exploration of other trends among sexual minority youth in these surveys, such as trends in common predictors of suicidal involvement, may help shed light on this widening disparity. Alternately, tracking changes over time in wider community attitudes and discourse about sexual minority populations, policies about bullying and harassment in school, or the increase or decline in availability of supportive GLB organizations such as gay-straight alliance clubs (GSAs) in schools might help explain these trends. A recent study in Massachusetts, for example, found that the presence of GSAs and anti-bullying policies, as well as supportive school personnel, were related to both lower victimization in the school and lower risk for suicide attempts among sexual minority youth (Goodenow, Szalacha & Westheimer, 2006). The study was cross-sectional, however, and did not track changes in policies or resources over time.

There are noted but varied gender differences in trends in suicidal ideation and attempts within the different surveys. Gender differences in suicide have been documented consistently in populations around the world, regardless of orientation. However, it is unclear why the disparity in suicide attempts appears to be widening for British Columbia lesbian and bisexual girls but narrowing for bisexual boys. Further studies should explore gender differences in risk factors for suicidality among sexual minority boys and girls, as well as qualitative studies of the different social meanings attributed to sexual minority orientations for boys and girls, to understand how their differing experiences may contribute to these differing trends.

## Strengths

Several factors strengthen our study's findings and usefulness. First, our results are based on several large-scale population-based studies set in demographically diverse regions across wide geographic areas in two countries, suggesting they can be generalized to a wider population of youth in school. Second, the surveys are repeated in the same regions multiple times, allowing us to identify trends in health disparities; to our knowledge, this has not been reported before, most likely because few repeating population-based surveys of adolescents



include measures of sexual orientation. Third, our datasets were large enough to analyze separately by gender and disaggregate bisexual youth from gay and lesbian peers. Finally, our datasets represent regions where the suicide risks of sexual minority youth have not, to date, been reported from population-based surveys, especially multiple cohorts across time.

### Limitations

As with all research, there are also some limitations to consider. First, these data rely on self-reports of both suicidal ideation and of sexual orientation, which may not completely correspond with youths' sexual orientation because sexual identity unfolds over adolescence, and self-labels and behaviour may change. Some researchers also have questioned the capacity of school-based surveys to accurately measure "true" suicide attempts, suggesting that students may often be reporting self-harm without a high level of lethality (Savin-Williams, 2001). Second, because the data were derived from school-based surveys, we are limited in our ability to generalize the results to youth who do not attend school, and some studies have suggested sexual minority youth may be less likely to be in school due to running away from home or being kicked out after disclosure to families (Murphy, Poon, Weigel & the McCreary Centre Society, 2001; Smith, Saewyc, Albert, et al., 2007). We were unable to control for ethnic background or socio-economic status in these surveys, which could potentially help explain trends in the suicide disparities over time. However, other studies have identified disparities in suicide for sexual minority youth in ethnic minority populations in North America, as well as elsewhere in the world, so controlling for ethnicity may have had minimal effect in this study.

These data cannot be used to compare prevalence rates across regions, because the surveys differed in sampling frame, age of respondents, and measurement of sexual orientation. However, the consistency of the relationship between sexual orientation and suicidality across differing surveys and differing measures indicates that this finding is robust. School-based population studies remain an effective tool for monitoring and surveillance of adolescent health indicators and risk. Because high school is compulsory in most regions, it also provides a more diverse population with respect to socio-economic status, ethnicity, and other demographic characteristics than either clinic-based or university-based samples can. Thus, to the extent school surveys include measures of sexual orientation, they provide more representative information on a stigmatized population than venue-based samples do.

### Recommendations for Research and Practice

Further research should focus on specific risk and protective factors affecting the likelihood of suicidal involvement among GLB youth, and on tracking changes in levels of these risk and protective factors over time. At present, few studies have explored protective factors in the lives of GLB youth (Eisenberg & Resnick, 2006; Saewyc, Skay, Bearinger & Resnick, 2005), and even fewer have examined their specific relationship to suicide attempts (Eisenberg & Resnick, 2007). What evidence exists to date suggests sexual minority youth have lower levels of protective factors such as supportive families and safe school environments, and this does help explain higher rates of suicide attempts (Eisenberg & Resnick; Goodenow et al., 2006). However, these are only some of the potential risk and protective factors that could influence suicide risk. Longitudinal and qualitative studies may be most effective at identifying specific causal pathways to suicidality for this population, in order to develop effective population-based interventions. Sexual orientation measures should be included in all population-based surveys, and where cohort trends are possible, monitoring trends over time should be encouraged. Analyses should disaggregate bisexual from gay or lesbian youth where possible. All youth should be regularly screened for suicide risk factors, and sexual minority youth should be supported through key periods that may place them at higher risk for suicide

attempts, such as disclosure of their sexual orientation to family, or experiencing harassment and victimization (D'Augelli et al., 2001).

## Conclusion

Gay, lesbian, and bisexual youth in the United States and Canada are at higher risk for suicidal ideation and attempts than their heterosexual peers, and this health disparity appears to have been increasing over the past decade, especially for bisexual adolescents. Interventions and policies to reduce emotional distress, depression, and suicidality among sexual minority youth should be a priority, in order to influence one of the leading causes of mortality among young people in North America.

## Acknowledgments

These analyses were supported by: grant# R01 MH-6258601 from the National Institute of Mental Health, National Institutes of Health (Saewyc, original PI; Skay, second PI), a Michael Smith Foundation for Health Research Career Scholar award (Saewyc, PI), and by a grant from the Institute for Gay and Lesbian Strategic Studies/Williams Institute/the Ford Foundation. Preliminary results for a portion of the analyses were presented at the 2004 annual meeting of the Society for Adolescent Medicine, St. Louis, MO. Thanks to Pamela Hillard, Seattle School District, for access to the Seattle Adolescent Health Surveys, Dr. Robert Blum, University of Minnesota, for access to the 1986 Minnesota Adolescent Health Survey, to the Minnesota Department of Education for access to the Minnesota Student Surveys, and to the McCreary Centre Society for access to the BC Adolescent Health Surveys. Thanks also to Yuko Homma, doctoral student, for some of the statistical analyses. The Institutional Review Board of the University of Minnesota reviewed this project, as did the Behavioural Research Ethics Board of the University of British Columbia.

## References

- Bagley C, Tremblay P. Elevated rates of suicidal behavior in gay, lesbian, and bisexual youth. *Crisis: The Journal of Crisis Intervention and Suicide Prevention* 2000;21:111–117.
- Borowsky I, Ireland M, Resnick M. Adolescent suicide attempts: Risks and protectors. *Pediatrics* 2001;107:485–493. [PubMed: 11230587]
- Cochran SD, Mays VM. Life prevalence of suicide symptoms and affective disorders among men reporting same-sex sexual partners: Results from NHANES III. *American Journal of Public Health* 2000;90:573–578. [PubMed: 10754972]
- D'Augelli AR, Hershberger SL, Pilkington NW. Suicidality patterns and sexual orientation-related factors among lesbian, gay, and bisexual youths. *Suicide & Life-Threatening Behavior* 2001;31:250–264. [PubMed: 11577911]
- Dawady, R. Unpublished masters thesis, University of Minnesota School of Nursing. Dec. 2004 2004 Sexual orientation and suicidal behavior among Asian adolescents in Minnesota.. [E. Saewyc, supervisor]
- Eisenberg ME, Resnick MD. Suicidality among gay, lesbian and bisexual adolescents: The role of protective factors. *Journal of Adolescent Health* 2006;39:662–668. [PubMed: 17046502]
- Eskin M, Kaynak-Demir H, Demir S. Same-sex sexual orientation, childhood sexual abuse, and suicidal behavior in university students in Turkey. *Archives of Sexual Behavior* 2005;34:185–195. [PubMed: 15803252]
- Faulkner AH, Cranston K. Correlates of same-sex sexual behavior in a random sample of Massachusetts high school students. *American Journal of Public Health* 1998;88:262–266. [PubMed: 9491018]
- Federal Bureau of Investigations. Hate crime statistics 2003. Federal Bureau of Investigations, U.S. Department of Justice; Washington DC: 2004. At <http://www.fbi.gov/ucr/ucr.htm#hate>
- Fergusson DM, Horwood LJ, Beautrais AL. Is sexual orientation related to mental health problems and suicidality in young people? *Archives of General Psychiatry* 1999;56:91:876–880. 933–939. [PubMed: 10530626]
- Goodenow C, Szalacha L, Westheimer K. School support groups, other school factors, and the safety of sexual minority adolescents. *Psychology in the Schools* 2006;43(5):573–589.
- Hershberger SL, Pilkington NW, D'Augelli AR. Predictors of suicide attempts among gay, lesbian and bisexual youth. *Journal of Adolescent Research* 1997;12:477–497.

- Igartua KJ, Gill K, Montoro R. Internalized homophobia: a factor in depression, anxiety, and suicide in the gay and lesbian population. *Canadian Journal of Community Mental Health* 2003;22:15–30. [PubMed: 15868835]
- Murphy, A.; Poon, C.; Weigel, M.; the McCreary Centre Society. No place to call home: A profile of street youth in British Columbia. The McCreary Centre Society; Burnaby, BC, Canada: 2001. Available at <http://www.mcs.bc.ca>
- National Vital Statistics. Deaths, percentage of total deaths, and death rates for the 10 leading causes of death in selected age groups, by race and sex: United States. *National Vital Statistics Reports* 2005;53:13.
- Paul JP, Catania J, Pollack L, Moskowitz J, Canchola J, Mills T. Suicide attempts among gay and bisexual men: Lifetime prevalence and antecedents. *American Journal of Public Health* 2002;92:1338–1345. [PubMed: 12144994]
- Pinhey TK, Millman SR. Asian/Pacific islander adolescent sexual orientation and suicide risk in Guam. *American Journal of Public Health* 2004;94:1204–1206. [PubMed: 15226144]
- Public Health Agency of Canada. Leading causes of death and hospitalization in Canada. 2003 [February 1, 2006]. Retrieved from: [http://www.phac-aspc.gc.ca/publicat/icdpcd97/mrt\\_mf\\_e.html](http://www.phac-aspc.gc.ca/publicat/icdpcd97/mrt_mf_e.html)
- Remafedi G, French S, Story M, Resnick MD, Blum R. The relationship between suicide risk and sexual orientation: Results of a population-based study. *American Journal of Public Health* 1998;88:57–60. [PubMed: 9584034]
- Remafedi G, Resnick MD, Blum R, Harris L. Demography of sexual orientation in adolescents. *Pediatrics* 1992;89:714–721. [PubMed: 1557267]
- Robin L, Brener ND, Donahue SF, Hack T, Hale K, Goodenow C. Associations between health risk behaviors and opposite-, same-, and both-sex sexual partners in representative samples of Vermont and Massachusetts high school students. *Archives of Pediatric Adolescent Medicine* 2002;156:349–355.
- Russell, S. Substance use and abuse and mental health among sexual-minority youths: Evidence from Add Health.. In: Omoto, AM.; Kurtzman, HS., editors. *Sexual orientation and mental health: Examining identity and development in lesbian, gay and bisexual people*. American Psychological Association; Washington DC: 2005.
- Russell ST, Franz BT, Driscoll AK. Same-sex romantic attraction and experiences of violence in adolescence. *American Journal of Public Health* 2001;91:903–906. [PubMed: 11392932]
- Russell ST, Joyner K. Adolescent sexual orientation and suicide risk: Evidence from a national study. *American Journal of Public Health* 2001;91:1276–1281. [PubMed: 11499118]
- Saewyc EM, Bauer GR, Skay CL, Bearinger LH, Resnick MD, Reis E, et al. Measuring sexual orientation in adolescent health surveys: Evaluation of eight school-based surveys. *Journal of Adolescent Health* 2004;35(4)
- Saewyc EM, Bearinger LH, Heinz PA, Blum RW, Resnick MD. Gender differences in health and risk behaviors among bisexual and homosexual adolescents. *Journal of Adolescent Health* 1998;23:181–188. [PubMed: 9730361]
- Saewyc EM, Singh N, Reis E, Flynn T. The intersections of racial, gender and orientation harassment in school and health risk behaviors among adolescents. [abstract]. *Journal of Adolescent Health* 2000;26:148.
- Saewyc EM, Skay CL, Bearinger LH, Blum RW, Resnick MD. Demographics of sexual orientation among American-Indian adolescents. *American Journal of Orthopsychiatry* 1998a;68:590–600. [PubMed: 9809118]
- Saewyc EM, Skay CL, Bearinger LH, Blum RW, Resnick MD. Sexual orientation, sexual behaviors, and pregnancy among American Indian adolescents. *Journal of Adolescent Health* 1998b;23:238–247. [PubMed: 9763160]
- Saewyc EM, Skay CL, Bearinger LH, Resnick MD. The prevalence of protective factors in the lives of bisexual adolescents in the U.S. and Canada. [abstract]. *Journal of Adolescent Health* 2005;36(2): 136–137.
- Savin-Williams RC. Suicide attempts among sexual-minority youths : Population and measurement issues. *Journal of Consulting and Clinical Psychology* 2001;69:983. [PubMed: 11777125]

- Skegg K, Nada-Raja S, Dickson N, Paul C, Williams S. Sexual orientation and self-harm in men and women. *American Journal of Psychiatry* 2003;160
- Smith, A.; Saewyc, E.; Albert, M.; MacKay, L.; Northcott, M.; the McCreary Centre Society. *Against the odds: A profile of marginalized and street-involved youth in BC*. The McCreary Centre Society; Vancouver, BC: 2007.
- van Heeringen C, Vincke J. Suicidal acts and ideation in homosexual and bisexual young people: A study of prevalence and risk factors. *Social Psychiatry and Psychiatric Epidemiology* 2000;35:494–499. [PubMed: 11197924]
- Walters K, Simoni J. Reconceptualizing Native women's health: An “indigenist” stress-coping model. *American Journal of Public Health* 2002;92:520–524. [PubMed: 11919043]
- Wichstrom L, Hegna K. Sexual orientation and suicide attempt: A longitudinal study of the general Norwegian adolescent population. *Journal of Abnormal Psychology* 2003;112:144–151. [PubMed: 12653422]

Sampling and Measurement in Each of the 9 Datasets

Table 1

Survey	Sampling	N	Grade s	% Female	Orientation Measure	~% GLB
BC03	stratified cluster (weighted) *	265,132	7 - 12	50.4%	attraction / label	5%
BC98	stratified cluster (weighted) *	278,683	7 - 12	52.7%	attraction / label	3%
BC92	stratified cluster (weighted) *	239,403	7 - 12	50.5%	attraction / label	3%
SE99	city-wide census	7,794	9 - 12	51.4%	attraction / label	4%
SE95	city-wide census	7,431	9 - 12	50.9%	attraction / label	4%
MN98	state-wide census	22,029	9 & 12	49.3%	sex partners past year (sexually active only)	9%
MN92	state-wide census	24,978	9 & 12	47.7%	sex partners past year (sexually active only)	7%
A190	national non-probability	7,013	7 - 12	47.3%	attraction / label	3%
MAHS86	stratified cluster	27,128	7 - 12	52.3%	attraction / label	2%

\* Classrooms were sampled within grade strata in health regions to be representative of all students enrolled in that grade throughout the province and in each health region; the data were weighted by Statistics Canada to adjust for the complex sampling strategy, differential response rates and probabilities of selection, and to provide population estimates based on actual enrollment.

**Table 2**  
Prevalence of Suicidal ideation among Boys and Girls in Each Orientation Group across 9 Studies (%)

	Girls				Boys			
	Bi	Het	MoHet	L	Bi	Het	MoHet	G
BC03	51.8	18.8	33.8	62.9	38.2	10.2	19.3	26.3
BC98	37.3	17.6	27.0	36.5	32.1	9.1	21.1	35.4
BC92	20.3	21.5	21.2	32.5	21.3	11.3	11.1	50.1
SE99	51.1	22.2	N/A	45.8	60.5	12.7	N/A	57.5
SE95	37.9	20.0	N/A	34.6	34.3	13.9	N/A	28.3
MIN98	72.5	55.1	N/A	70.6	48.7	34.5	N/A	39.8
MIN92	46.9	35.1	N/A	43.5	39.2	23.4	N/A	37.4
A190	36.5	31.5	27.4	50.0	40.8	23.1	24.0	47.4
MAHS86	37.0	32.7	35.4	33.3	26.7	18.6	24.0	38.2

**Table 3**

Age-Adjusted Odds Ratios for Suicidal Ideation among Boys and Girls across 9 Studies

	Girls			Boys		
	Bi v. Het (95% CI)	Bi v. MoHet (95% CI)	Bi v. L (95% CI)	Bi v. Het (95% CI)	Bi v. MoHet (95% CI)	Bi v. G (95% CI)
BC03	4.7 (4.5-5.1)	2.1(2.0-2.3)	0.6(0.5-0.8)	5.4 (4.8-6.0)	2.6 (2.2-3.0)	1.7 (1.4-2.1)
BC98	2.7 (2.5-2.9)	1.6 (1.5-1.8)	NS	4.8 (4.3-5.4)	1.8 (1.6-2.1)	NS
BC92	NS	NS	0.5 (0.4-0.7)	2.1 (1.9-2.4)	2.2 (1.9-2.5)	0.3 (0.2-0.3)
SE99	3.7 (2.7-4.9)	N/A	NS	10.4 (6.7-16.3)	N/A	NS
SE95	2.5 (1.8-3.5)	N/A	NS	3.3 (2.2-5.1)	N/A	NS
MN98	1.9 (1.5-2.4)	N/A	NS	1.7 (1.6-2.0)	N/A	1.4 <sup>‡</sup> (1.0-1.9)
MN92	1.4 (1.1-1.8) <sup>‡</sup>	N/A	NS	2.0 (1.8-2.3)	N/A	NS
AI90	NS	NS	NS	2.3 (1.4-3.7)	2.2 <sup>‡</sup> (1.2-3.8)	NS
MAHS86	NS	NS	NS	1.6 <sup>‡</sup> (1.0-2.5)	NS	NS

All p=<.001 except where noted

NS= Not Significant; N/A= Not Applicable

<sup>‡</sup> p<.01.

<sup>‡</sup> p<.05

**Table 4**

Prevalence of Suicide Attempts among Boys and Girls in Each Orientation Group across 9 studies (%)

	Girls					Boys				
	Bi	Het	MoHet	L	Bi	Het	MoHet	G		
BC03	30.4	8.2	17.2	38.0	12.8	3.3	7.4	8.8		
BC98	26.4	8.6	12.0	24.5	17.8	3.1	8.3	21.9		
BC92	18.8	9.7	11.7	12.8	11.5	3.6	3.2	44.4		
SE99	30.7	7.9	N/A	16.0	37.2	4.5	N/A	38.5		
SE95	22.0	8.6	N/A	20.8	22.7	4.9	N/A	15.4		
MIN98	47.1	24.9	N/A	43.1	29.1	11.3	N/A	19.9		
MIN92	38.5	29.3	N/A	17.8	26.4	13.2	N/A	21.4		
A190	24.5	25.4	23.0	26.1	16.9	12.6	15.0	30.0		
MAHS86	20.6	15.3	18.8	20.0	28.2	6.9	9.2	27.9		



Table 5

Age-Adjusted Odds Ratios for Suicide Attempts among Boys and Girls across 9 Studies

	Girls			Boys		
	Bi v. Het (95% CI)	Bi v. MoHet (95% CI)	Bi v. L (95% CI)	Bi v. Het (95% CI)	Bi v. MoHet (95% CI)	Bi v. G (95% CI)
BC03	5.0 (4.7-5.4)	5.0 (4.7-5.4)	0.7 <sup>†</sup> (0.6-0.9)	4.4 (3.7-5.2)	1.8 (1.5-2.2)	1.5 <sup>†</sup> (1.1-2.0)
BC98	3.8 (3.5-4.2)	2.6 (2.4-2.9)	NS	6.8 (6.0-7.8)	2.4 (2.0-2.8)	0.8 <sup>†</sup> (0.6-0.9)
BC92	2.1 (1.9-2.4)	1.7 (1.5-2.0)	1.5 <sup>†</sup> (1.0-2.3)	3.5 (3.0-4.0)	3.9 (3.2-4.8)	0.2 (0.1-0.2)
SE99	5.2 (3.7-7.3)	N/A	NS	12.5 (7.8-19.9)	N/A	NS
SE95	3.1 (2.1-4.6)	N/A	NS	5.8 (3.4-9.7)	N/A	NS
MIN98	2.3 (1.9-2.9)	N/A	NS	3.0 (2.7-3.5)	N/A	1.6 <sup>‡</sup> (1.1-2.4)
MIN92	1.3 <sup>‡</sup> (1.0-1.7)	N/A	3.1 <sup>†</sup> (1.4-7.1)	2.3 (2.0-2.6)	N/A	NS
AI90	NS	NS	NS	NS	NS	NS
MAHS86	1.5 <sup>†</sup> (1.0-2.3)	NS	NS	5.3 (3.5-8.1)	3.8 (2.4-6.1)	NS

All p<=.001 except where noted

NS= Not Significant; N/A= Not Applicable

<sup>†</sup> p<=.01.

<sup>‡</sup> p<=.05