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Suicidality and sexual orientation among men in Switzerland: Findings from 3 probability surveys

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ABSTRACT

Few population-based surveys in Europe have examined the link between suicidality and sexual orientation. The objective of this study was to assess the prevalences of and risk for suicidality by sexual orientation, especially among adolescent and young adult men. Data came from three probability-based surveys in Switzerland from 2002: 1) Geneva Gay Men's Health Survey (GGMHS) with 571 gay/bisexual men, 2) Swiss Multicenter Adolescent Survey on Health (SMASH) with 7,428 16–20 year olds, and 3) Swiss Recruit Survey (ch-x) with 22,415 new recruits. In GGMHS, suicidal ideation (12 months/lifetime) was reported by 22%/55%, suicide plans 12%/38%, and suicide attempts 4%/19%. While lifetime prevalences and ratios are similar across age groups, men under 25 years reported the highest 12-month prevalences for suicidal ideation (35.4%) and suicide attempts (11.5%) and the lowest attempt ratios (1:1.5 for attempt to plan and 1:3.1 for attempt to ideation). The lifetime prevalence of suicide attempts among homo/bisexual men aged 16–20 years varies from 5.1% in ch-x to 14.1% in SMASH to 22.0% in GGMHS. Compared to their heterosexual counterparts, significantly more homo/bisexual men reported 12-month suicidal ideation, plans, and attempts (OR = 2.09–2.26) and lifetime suicidal ideation (OR = 2.15) and suicide attempts (OR = 4.68–5.36). Prevalences and ratios vary among gay men by age and among young men by both sexual orientation and study population. Lifetime prevalences and ratios of non-fatal suicidal behaviors appear constant across age groups as is the increased risk of suicidality among young homo/bisexual men.

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1. Introduction

1.1. Prevalence of suicidality in the general population

In Europe, rates of suicide vary strongly between regions—highest in the east and lowest in the south (Chishti et al., 2003)—and are correlated with rates of suicide attempts, especially among young men (Hawton et al., 1998). Although suicidality—i.e., suicidal ideation, suicide plans, and suicide attempts—is not regularly assessed in most countries, multi-national studies have presented compelling discrepancies across countries and by sex and age group (Nock et al., 2008; Kovess-Masfety et al., 2011). According to studies in western and northern Europe, the prevalence of suicidal ideation in the male

general population is 3–14% lifetime (Weissman et al., 1999; Nock et al., 2008) or 2–7% in the past year (Hintikka et al., 1998; Kjølner and Helweg-Larsen 2000), whereas the prevalence of suicide attempts is 1–4% lifetime (Weissman et al., 1999; Nock et al., 2008; McManus et al., 2009) or 0.5–1% in the past year (Hintikka et al., 1998; McManus et al., 2009).

Generally, suicidality has been assessed more frequently in adolescent health surveys which have also yielded much higher prevalence estimates: in Europe, the mean prevalence of suicide attempts is 6.9% lifetime or 2.0% in the past year (Evans et al., 2005). Switzerland has one of the higher rates of completed suicides and occupies an intermediate position in attempted suicides (Bille-Brahe, 1999), yet population data on suicidality exist only for adolescents. According to the 1992 Swiss Multicenter Adolescent Survey on Health (SMASH), 26% of 15–20 year old students reported suicidal thoughts, 15% suicidal plans, and 3% suicide attempts in the past year (Rey Gex et al., 1998). According to the 1993 Swiss Recruit Survey of 20 year olds, 49.1% reported lifetime suicidal ideation and 2.3% suicide attempts (Mohler-Kuo et al., 2006).

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1.2. Prevalence of suicidality among gay men

Compelling evidence for higher risk of suicidal behaviors associated with homosexuality have come from a Christchurch (New Zealand) birth cohort (OR = 5.4 for lifetime suicidal ideation and OR = 3.0–6.2 for lifetime suicide attempts) (Fergusson et al., 1999; Skegg et al., 2003), a US male twin registry (OR = 4.1 for lifetime suicidal ideation and OR = 6.5 for lifetime suicide attempts) (Herrell et al., 1999), a Danish national population registry (OR = 1.9–8.2 for suicide incidence) (Mathy et al., 2011), several national health surveys in Europe and North America (OR = 1.9–7.7 for lifetime suicidal ideation and OR = 2.2–10.2 for lifetime suicide attempts among men and/or men and women combined) (Cochran and Mays, 2000; Gilman et al., 2001; de Graaf et al., 2006; Jouvin et al., 2007; Brennan et al., 2010; Bolton and Sareen, 2011; Chakraborty et al., 2011), and several national/regional adolescent health surveys in Europe and North America (OR = 4.3–6.7 for lifetime suicide attempts among male and/or male and female secondary school students combined) (Remafedi et al., 1998; Wichstrøm and Hegna, 2003) (NB: An excellent overview of findings on suicidality in the past 12 months by sexual orientation among high school students in the various Youth Risk Behavior Surveys is presented in Kann et al., 2011).

Reviews of studies examining suicidality among sexual minorities point out discrepancies by country/region, sex, and age group (Russell and Toomey, 2010; Haas et al., 2011), albeit with some noteworthy distinctions. Both fatal and non-fatal suicidality appear to be more pronounced among gay/bisexual men than women (Haas et al., 2011). Although suicidality among sexual minorities also appears to be especially elevated during adolescence (Russell and Toomey, 2010), prevalences of lifetime suicidality remain high among sexual minority adults whereas they fall among general population adults.

National health surveys with representative samples of self-reported gay/bisexual men in western Europe have yielded lifetime prevalences of 33–40% for suicidal ideation (Statens Folkhälsoinstitut, 2005; de Graaf et al., 2006) and 10–15% for suicide attempts (Statens Folkhälsoinstitut, 2005; de Graaf et al., 2006; Jouvin et al., 2007) as well as 12-month prevalence of 13% for suicidal ideation (Jouvin et al., 2007). A national survey among secondary school students in Norway reported a lifetime prevalence of 15.4% for suicide attempts among male and female homo/bisexual respondents (Wichstrøm and Hegna, 2003).

Studies with convenience samples of gay men in western Europe have found lifetime prevalences of 47% for suicidal ideation (Warner et al., 2004) and 15–25% for suicide attempts (Cochand and Bovet, 1998; Hegna et al., 1999; Warner et al., 2004; Mayock et al., 2009). Studies with convenience samples of young gay men (between 15–16 and 24–27 years) in western Europe have yielded lifetime prevalences of 71% for suicidal ideation (McNamee, 2006) and 12–27% for suicide attempts (van Heeringen and Vincke, 2000; Cochand et al., 2000; Hanner, 2002; McNamee, 2006; Hegna and Wichstrøm, 2007). Using convenience samples of gay men in French-speaking Switzerland, Cochand and colleagues have reported lifetime prevalences of 23% for suicide attempts among gay men (Cochand and Bovet, 1998) and 24% among young gay men aged 16–25 years (Cochand et al., 2000). In brief, the prevalences reported in convenience samples appear to be higher than those in probability samples. For an exhaustive overview of studies in Europe and internationally, please consult the website by Ramsey and Tremblay (2011).

This growing body of evidence has not always influenced public health action—or even mention—of sexual minorities in suicide prevention programs and strategies. As in most places, sexual minorities are largely invisible in suicide prevention efforts in Switzerland, and one reason may be the dearth of Swiss data. Given

the relative paucity of population data on suicidality in Europe generally, for sexual minorities in Europe specifically, and for sexual minority adolescents in Europe in particular (to date, only one publication from Norway), this paper contributes to the evidence base by presenting findings for the key forms of suicidality from three distinct probability samples of men in Switzerland.

As the afore-mentioned findings all point to increased risk of suicidality among gay men and young gay men, our working hypothesis is that the three samples will also yield higher prevalences and risk for suicidality in this group. However, given the wide ranges in OR and prevalences reported in the literature, we wish to situate the actual levels—bolstered due to possible homogeneity across samples—for this group in Switzerland. Most studies collect and present data for only one or two forms of suicidality along a single time frame. Since differences by region, time frame, sex, and age also appear to be relevant among sexual minorities, we wanted to explore possible differences in time frame, age, and sampling design by directly comparing data on three forms of suicidality, across two time frames, from three different samples. The two nation-wide adolescent samples complement the gay male community sample by including young men who have not yet presented at meeting points. In turn, the gay male community sample complements the adolescent surveys with data on suicidality post-adolescence and the inclusion of gay-specific variables. Through their juxtaposition, we explore in a direct and explicit way whether a coherent picture for higher prevalences and risk among sexual minority men emerges.

2. Data & methods

2.1. Study samples and measures of sexual orientation and suicidality

The first Geneva Gay Men's Health Survey (GGMHS) was a comprehensive health interview survey conducted in 2002 among gay men in Geneva, using time-space sampling at both physical venues and virtual meeting points (for a detailed description of the methods, see Wang, Häusermann, Vounatsou et al., 2007). All 571 participants were either self-identified gay/bisexual men or other men who have sex with men. No age limits were imposed, and the final sample had a mean and median age of 35 years (range 14–83). Participants filled out anonymous self-completed questionnaires on the computer in French. Mental health was an important domain. In addition to major depression (and 4 other disorders) measured using the CIDI-SF (Kessler et al., 1998), 12-month and lifetime suicidality were measured using Paykel's 5 items covering life weariness ("Have you ever felt that life was not worth living?"), death wishes ("Have you ever wished you were dead? – for instance, that you could go to sleep and not wake up?"), suicidal ideation ("Have you ever thought of taking your life, even if you would not really do it?"), suicide plans ("Have you ever reached the point where you seriously considered taking your life or perhaps made plans how you would go about doing it?"), and suicide attempt ("Have you ever made an attempt to take your life?") (Paykel et al., 1974).

The second Swiss Multicenter Adolescent Survey on Health (SMASH) was conducted in 2002 among 7428 adolescents (4044 males and 3384 females) aged 16–20 years in post-compulsory schooling, using a two-stage cluster sampling of schools in 19 of 26 cantons (for a detailed description of the methods, see Jeannin et al., 2005). Participants filled out anonymous self-completed paper questionnaires in German, French, or Italian. Sexual orientation was assessed by a single question on sexual attraction from the Minnesota Adolescent Health Survey ("Which of the following best describes your feelings? I am only attracted to people of my

own sex and will only be sexual with persons of the same sex. I am strongly attracted to people of the same sex, and most of my sexual experiences will be with persons the same sex as mine. I am equally attracted to men and women and would like to be sexual with both. I am strongly attracted to persons of the opposite sex, and most of my sexual experience will be with persons of the opposite sex. I am only attracted to persons of the opposite sex and will only be sexual with persons of the opposite sex. Not sure"). Suicidality in the past 12 months was assessed by 5 questions covering suicidal ideation ("Have you ever thought about suicide?"), suicide plans ("Were there times when you would have wanted to commit suicide/kill yourself?", "Would you have committed suicide/killed yourself if given a chance?", and "Have you thought about the methods you could use to commit suicide/kill yourself?"), and suicide attempt ("Have you attempted suicide?"). There was one question on lifetime suicide attempt ("Have you ever attempted suicide?").

The second Swiss Recruit Survey (ch-x) on health was a survey conducted among 22,415 new recruits (22,191 males and 224 females) for the Swiss armed forces (mostly aged 20 yrs) at the recruit schools in 2002–3 (for a detailed description of the methods, see Wydler, 2011). Military service is compulsory for Swiss men and voluntary for Swiss women, and 50% of all recruits were selected with a 100% participation rate. Participants filled out anonymous self-completed paper questionnaires in German, French, or Italian. Sexual orientation was assessed with a single question on sexual attraction with an eleven-point scale ("Do you feel more sexually attracted to women or to men? I feel... 1 "attracted to men", 6 "attracted to both", and 11 "attracted to women"). Lifetime suicidality was assessed with a single question covering both ideation and attempt ("There are many people who have thought about suicide. Have you ever thought that it will be better to end your life? I have already made a suicide attempt. Yes, I have already thought seriously about it. Yes, I have had such a thought. No, none of these statements apply to me.").

Only the male respondents in SMASH and the male recruits in ch-x were considered for this paper. In SMASH 2002, the male school respondents could be classified as follows: 72.5% only heterosexual, 23.3% mostly heterosexual, 0.8% equally bisexual, 0.4% mostly homosexual, 0.4% only homosexual, and 2.6% non-response. In ch-x 2002/03, the male military recruit respondents could be classified as follows: 91.7% only heterosexual, 5.3% mostly heterosexual, 0.9% equally bisexual, 0% mostly homosexual, 0.7% only homosexual, and 1.2% non-response. Given comparable prevalences for suicidality, the categories "equally bisexual", "mostly homosexual", and "only homosexual" were collapsed into a single category "homo/bisexual" for both clarity and improved statistical power. With the exception of lifetime suicide ideation, "mostly heterosexual" young men and non-responders to the question on sexual orientation reported prevalences of suicidality comparable to their "only heterosexual" counterparts. For clarity and conciseness, only the findings for "only heterosexual" (72.5% in SMASH and 91.7% in ch-x) and "homo/bisexual" (1.6% in SMASH and 1.6% in ch-x) young men will be reported.

2.2. Statistical analysis

Data analysis was performed separately for each of the 3 datasets using SPSS 17 for Mac OS X (Chicago, IL, USA). The point prevalences for suicidal ideation, suicide plans, and suicide attempts were the key indicators. The 95% confidence intervals (CI) reflect the different sizes between groups and surveys. Ratios between the prevalences of three suicidal behaviors offer a convenient and useful indication of severity. Odds ratios (OR) are presented without adjustment for covariates, given the different measures and selection of measures used in the 3 surveys.

3. Results

3.1. Suicidality among gay men in the Geneva region

Table 1 shows the lifetime and 12-month prevalences of five suicide behaviors among men from the Geneva Gay Men's Health Survey (GGMHS). Overall, 69.8% of the respondents reported any of the five suicide behaviors in their lifetime and 32.5% in the past 12 months. Among those reporting at least one behavior, 87.1% reported more than one in their lifetime and 68.6% in the past 12 months. Although life weariness, death wishes, and suicidal ideation were equally prevalent at just over 50% lifetime and 20% in the past 12 months, suicidal ideation was more prevalent than suicide plans (38.7% lifetime, 12.4% past year) which was in turn more prevalent than suicide attempts (18.6% lifetime, 3.6% past year).

The mean and median age of first suicide attempt is 20 years, with the first quartile at 15 years and the third quartile at 24 years. With the exception of men 55 years and over, the lifetime prevalences for suicidal ideation, plans, and attempts are similar across all age groups as are the lifetime ratios—i.e., every second person reporting a suicide plan and every third person reporting suicidal ideation also reported a suicide attempt. In contrast, the 12-month prevalences and ratios for suicidal ideation, plans, and attempts exhibit strong age-group effects as evidenced in Table 2. Men under 25 years reported the highest prevalences (35.4% thought about suicide and 11.5% attempted suicide) and the lowest attempt ratios (1:1.5 for attempt to plan and 1:3.1 for attempt to ideation) in the past 12 months. Indeed, the 12-month attempt ratios differ dramatically across age groups (from 1:1.5–8.9 for attempt to plan and 1:3.1–13.7 for attempt to ideation).

Given the highest 12-month prevalences of suicidality in the under-25 age group (and that three-quarters of all lifetime suicide attempts debut in this age group), we supplement these findings with data on suicidality from two youth health surveys. Taking the target age group in SMASH of 16–20 year olds, suicidality and sexual orientation for this age group can be compared for males recruited from gay venues in GGMHS, schools in SMASH, and military recruit schools in ch-x.

3.2. Suicidality among adolescent/young men in Switzerland by sexual orientation

Table 3 presents an overview of lifetime and 12-month suicidality among men 16–20 years by sexual orientation in each of the three studies (NB: SMASH and ch-x did not assess all forms of suicidality along both time frames). Although the lifetime prevalence of suicidal ideation is comparable for homo/bisexual men in both GGMHS and ch-x at just above 60%, the lifetime prevalence of suicide attempts among homo/bisexual men rises from 5.1% in ch-x to 14.1% in SMASH to 22.0% in GGMHS. The lifetime prevalence of suicide attempts among the reference populations of heterosexual men is twice as high in SMASH than in ch-x (3.0% vs. 1.3%, $p < 0.05$).

Table 1

Lifetime and 12-month prevalence of suicidality among gay men in GGMHS, 2002 ($N = 571$).

	Lifetime	<12 months
Any suicide symptom	69.8	32.5
Life weariness	53.4	21.6
Death wishes	58.4	21.6
Suicidal ideation	55.4	21.9
Suicide plans	38.7	12.4
Suicide attempts	18.6	3.6

Table 2
12-month prevalence and ratios of suicidality by age group, among gay men in GGMHS, 2002.

	n	Prevalence, %			Ratio		
		Suicidal ideation	Suicide plans	Suicide attempts	Attempt: plan	Attempt: ideation	Plan: ideation
<25 years	96	35.4	17.6	11.5	1:1.5	1:3.1	1:2.0
25–34 years	173	20.8	10.4	2.3	1:4.5	1:9.0	1:2.0
35–44 years	194	20.6	13.4	1.5	1:8.9	1:13.7	1:1.5
45–54 years	67	14.9	9.3	3.0	1:3.1	1:5.0	1:1.6
≥55 years	28	7.1	8.7	0.0	–	–	1:0.8
Total	558	21.9	12.4	3.6	1:3.4	1:6.1	1:1.8

Looking at 12-month prevalences of suicidality among homo/bisexual men in GGMHS and SMASH, the prevalences for suicide plans are comparable, yet suicidal ideation and suicide attempt are both considerably more prevalent in GGMHS. The fact that the 12-month prevalences for both suicidal ideation and suicide plans are essentially the same among both heterosexual and homo/bisexual men in SMASH point to methodological considerations such as question formulation or data entry/programming error.

The ratios between the different suicidal behaviors presented in Table 4 reveal additional information. The ratio of lifetime suicide attempt to ideation is almost 3 times higher among homo/bisexual men (1:12) than their heterosexual counterparts (1:33.9) in ch-x. The ratios of all three 12-month suicidal behaviors are highly comparable between the two groups in SMASH, but the same methodological considerations may apply. Where comparisons are possible, the ratios among homo/bisexual men in GGMHS are considerably higher than those in the two youth health surveys: 1 out of every 3 men in GGMHS who ideate also attempts suicide (both lifetime and in the past 12 months).

The differences in various suicidal behaviors between young homo/bisexual and heterosexually attracted men are quantified with odds ratios (OR) in Table 5. Compared to heterosexual men as the reference group, significantly more homo/bisexual men reported 12-month suicidal ideation, plans, and attempts (OR = 2.26, 2.18, and 2.09, respectively) and lifetime suicidal ideation (OR = 2.15). Despite significantly different prevalences, the OR for lifetime suicide attempts among homo/bisexual men are similar between SMASH (OR = 5.36) and ch-x (OR = 4.68).

Table 3
Lifetime and 12-month prevalence of suicidality among men 16–20 years by sexual orientation in ch-x, SMASH, and GGMHS, 2002.

	n	Lifetime		<12 months	
		%	95% CI	%	95% CI
Suicidal ideation					
Heterosexual men (ch-x)	17072	44.1	(43.4–44.8)	NA	NA
Heterosexual men (SMASH)	2901	NA	NA	15.5	(14.2–16.8)
Homo/bisexual men (ch-x)	296	61.1	(55.5–66.7)	NA	NA
Homo/bisexual men (SMASH)	65	NA	NA	29.2	(18.1–40.3)
Homo/bisexual men (GGMHS)	41	63.4	(48.7–78.1)	48.8	(33.5–64.1)
Suicide plans					
Heterosexual men (ch-x)	NA	NA	NA	NA	NA
Heterosexual men (SMASH)	2896	NA	NA	16.6	(15.2–18.0)
Homo/bisexual men (ch-x)	NA	NA	NA	NA	NA
Homo/bisexual men (SMASH)	66	NA	NA	30.3	(19.2–41.4)
Homo/bisexual men (GGMHS)	28	46.4	(27.9–64.9)	25.0	(9.0–41.0)
Suicide attempts					
Heterosexual men (ch-x)	17072	1.3	(1.1–1.5)	NA	NA
Heterosexual men (SMASH)	2903	3.0	(2.4–3.6)	1.5	(1.1–1.9)
Homo/bisexual men (ch-x)	296	5.1	(2.6–7.6)	NA	NA
Homo/bisexual men (SMASH)	64	14.1	(5.6–22.6)	3.1	(–1.1–7.3)
Homo/bisexual men (GGMHS)	41	22.0	(9.3–34.7)	17.1	(5.6–28.6)

NA = not available.

4. Discussion

Despite mounting evidence of higher risk of suicidality among sexual minorities, this issue has often been met with skepticism or inattention in Switzerland and elsewhere. This paper presents findings from 3 distinct surveys which all point to higher prevalences and risk of lifetime and 12-month suicidal ideation, suicide plans, and suicide attempts among gay and other homo/bisexually attracted men in Switzerland.

Despite heterogeneity in prevalence values for some indicators between surveys, the odds ratios (OR) for increased risk are remarkably clear and uniform: OR \approx 5 for lifetime suicide attempts and OR \approx 2 for all other forms of suicidality measured. While the convergent odds ratios and the divergent prevalences evidenced in the 3 surveys generally fall within the ranges shown in the literature, they also serve to remind the reader that the findings must be interpreted against some important methodological considerations.

4.1. Limitations

First, while all 3 studies employ probability sampling in 2002, each draws its sample from a distinct base population.

- The first Geneva Gay Men's Health Survey (GGMHS) drew its sample from all physical and virtual meeting points for gay-identified and/or homosexually active men in the Geneva area. As such, the sample does not include men who do not access the meeting points, such as men who are not yet socially active with other gay men or sexually active with other men.
- The second Swiss Multicenter Adolescent Survey on Health (SMASH) drew its sample of 16–20 year olds in post-compulsory schooling. Although representative of students and apprentices, an estimated 20% of this age group are either attending another form of training or have entered the job market (Jeannin et al., 2005). Samples of adult gay men consistently demonstrate higher education, so while a school-based sample is likely to capture many future gay men, the most vulnerable segment among both homosexuals and heterosexuals is likely to have dropped out (Delbos-Piot et al., 1995).
- The second Swiss Recruit Survey (ch-x) drew its sample from new recruits of the Swiss army. Non-Swiss citizens (22% of the resident population) were excluded from the survey, as were Swiss men with health exemptions and those opting for civil service. A significant proportion of Swiss gay men avoid compulsory military service through those means.

While GGMHS excludes many young men who have not yet had their first contact with gay meeting points, SMASH and especially ch-x may have a bias toward healthier respondents which accounts in part for the significantly lower prevalences of suicidality among both homo/bisexual and heterosexual respondents in ch-x

Table 4

Lifetime and 12-month ratios of suicidality among men 16–20 years by sexual orientation in ch-x, SMASH, and GGMHS, 2002.

	n	Lifetime			<12 months		
		Attempt plan	Attempt: ideation	Plan: ideation	Attempt: plan	Attempt: ideation	Plan: ideation
Heterosexual men (ch-x)	17072	NA	1:33.9	NA	NA	NA	NA
Heterosexual men (SMASH)	2903	NA	NA	NA	1:10.9	1:10.2	1:0.9
Homo/bisexual men (ch-x)	296	NA	1:12	NA	NA	NA	NA
Homo/bisexual men (SMASH)	66	NA	NA	NA	1:9.8	1:9.4	1:1
Homo/bisexual men (GGMHS)	41	1:2.1	1:2.9	1:1.4	1:1.5	1:2.9	1:2

NA = not available.

compared to both SMASH and GGMHS, and indeed most published studies to date.

Second, sexual orientation was assessed differently in each survey. Homo/bisexual identity and/or homo/bisexual behavior constituted eligibility criteria for GGMHS which did not have a heterosexual comparison group. While the two youth health surveys permit comparisons against control groups, sexual attraction was measured on a 5-point scale in SMASH and an 11-point scale in ch-x. While 1.6% of respondents reported homo- or bisexual attraction, there were large differences between the two studies among men who reported “mostly heterosexual” and “only heterosexual” attraction, the comparison group. Given the stigmatization of homosexuality, men do not always report homosexual attraction or activity until they have largely completed the process of coming to terms with a stigmatized identity. The median age for initial disclosure of homosexual orientation in GGMHS is 21 years which means that less than half of the men in the 16–20 year age group have reached that point. In a nation-wide school-based survey on sexuality, 1.7% of the male respondents self-identified as homo/bisexual and 3.9% reported homo/bisexual attraction (Narring et al., 2003), confirming likely under-estimation of homosexual respondents in SMASH and ch-x. The discrepancy may be due to the subject matter (focus on sexuality vs. general health and well-being) or mode of data collection (computer self-administered interview vs. self-completed paper questionnaire) (Turner et al., 1998).

Third, suicidality was assessed with a different battery of questions in each survey. Only GGMHS implemented an internationally validated battery of questions on suicidality, whereas SMASH and ch-x radically adapted their questions from existing instruments.

Table 5

Lifetime and 12-month odds ratios (OR) of suicidality among men 16–20 years by sexual orientation in ch-x and SMASH, 2002.

	ch-x		SMASH	
	OR	95% CI	OR	95% CI
Lifetime				
Suicidal ideation				
Heterosexual men	1.00		NA	NA
Homo/bisexual men	2.15	(1.72–2.67)	NA	NA
Suicide plans				
Heterosexual men	NA	NA	NA	NA
Homo/bisexual men	NA	NA	NA	NA
Suicide attempts				
Heterosexual men	1.00		1.00	
Homo/bisexual men	4.68	(3.06–7.15)	5.36	(2.57–11.2)
<12 months				
Suicidal ideation				
Heterosexual men	NA	NA	1.00	
Homo/bisexual men	NA	NA	2.26	(1.31–3.89)
Suicide plans				
Heterosexual men	NA	NA	1.00	
Homo/bisexual men	NA	NA	2.18	(1.28–3.72)
Suicide attempts				
Heterosexual men	NA	NA	1.00	
Homo/bisexual men	NA	NA	2.09	(0.50–8.81)

NA = not available.

Translations also differed in their inclusion of the term “suicide”. While all surveys assessed more than one suicide behavior, only GGMHS assessed all three suicidal behaviors at two time intervals (lifetime and in the past 12 months).

Finally, it is important to note that 20 years is the mean and median age reported for the first suicide attempt among gay men in GGMHS. Therefore, the age group of 16–20 years covered by the three-study comparison in this paper actually precludes half of all gay men attempting suicide for the first time. In accordance with studies among both the general and gay male populations, GGMHS finds the highest 12-month prevalences of suicidality and the lowest 12-month ratios of suicide attempts to plans and ideation in the youngest age group. GGMHS also replicates the age discrepancy between the general and gay male populations with high lifetime prevalences of suicidality across all age groups well into middle age.

As seen in cross-sample/country comparisons (Bertolote et al., 2005), suicidal ideation may not be indicative of suicide plans or attempts in a constant way across groups. Although lifetime prevalences of suicidality were comparable across age groups, young gay men not only reported higher prevalences of all forms of suicidality in the past 12 months than their older counterparts, but twice as many ideators (i.e., 1 out of 3) attempted suicide. Homo/bisexual men aged 16–20 years in GGMHS not only reported higher prevalence of suicidal attempts but also 3–4-times lower attempt-to-ideation ratios than their counterparts in SMASH and ch-x, suggesting greater severity of suicidal ideation. In turn, attempt-to-ideation ratios among young homo/bisexual men were 1–3-times lower than their heterosexual counterparts. Besides demonstrating a certain degree of heterogeneity between the various forms of suicidality, these findings further underscore higher levels of suicidality among young homo/bisexual men, particularly in GGMHS.

4.2. Timing of gay developmental milestones and onset of suicide attempts

Addressing the multiple risk factors for increased suicidality among gay men lies beyond the scope of the current paper. Several excellent overviews (Kulkin et al., 2000; Saewyc, 2007; Haas et al., 2011) review the evidence for both higher prevalence of common causes such as previous suicide attempt and major depression as well as causes unique to sexual minorities such as coming out and gender (role) non-conformity.

To better contextualize the different prevalences in suicide attempts among the young homo/bisexual men in the 3 surveys, a life-course approach juxtaposes the onset of psychiatric morbidity and suicidality against gay developmental milestones (measured only in GGMHS). Previously, we noted that the onset of major depression (median age = 16 years) lies between the first homosexual attraction (median age = 12 years) and the first homosexual encounter (median age = 18 years) (Wang, Häusermann, Ajdacic-Gross et al., 2007). We now add the first suicide attempt (median age = 20 years) lies between the first homosexual encounter (median age = 18 years) and first coming out (median age = 21

years). This sequence appears to suggest that the circumstances and stress encountered at each milestone may trigger depression and/or suicidality among some gay men.

Indeed, in-depth studies have noted the association of age at initial suicide attempt with age at first homosexual encounter (Wichstrøm and Hegna, 2003) and coming out (Remafedi et al., 1991) rather than chronological age per se. Studies have also shown that younger age at onset for any or all gay developmental milestones are associated with greater social and health risks (D'Augelli et al., 1998; Kulkin et al., 2000; Friedman et al., 2008). Given its sampling procedure, GGMHS includes young men who are not only more likely to have had already hit those gay developmental milestones but also hit them at a younger age overall. These factors may account in part for the higher prevalences of suicidality found in GGMHS and other random and non-random gay community samples.

4.3. Conclusions

In summary, the prevalences of suicidality and their ratios differ among gay men by both age and time frame and among young men by both sexual orientation and study population. Although increased risk of suicidality is especially pronounced among young homo/bisexual men, it remains elevated among gay men through middle age. Among gay men, homogenous lifetime prevalences and ratios across all age groups contrast with variable 12-month prevalences and ratios which are most discrepant in the youngest age group. Here, prevalences grow increasingly discrepant as one moves from suicidal ideation to suicide attempts and are most pronounced in GGMHS, the group which has already gone through various gay developmental milestones.

These findings underscore two important take-home messages. Firstly, a certain homogeneity gives way to increasing heterogeneity as the time frame becomes more recent and as the form of suicidality becomes more severe. As such, different indicators of suicidality, time frames, and samples complement each other in providing a more complete picture. Secondly, point prevalence estimates of suicidality among the most vulnerable group—i.e., homo/bisexual men in their late teens and early twenties—should be interpreted with particular caution, since they appear to be particularly sensitive to sampling young men who have reached certain developmental milestones and/or demonstrate greater vulnerability to more severe forms of suicidality.

Against this differentiated picture of suicidality among gay men, the lifetime prevalences and ratios of suicidal behaviors are constant across age groups as is the increased 2–5-fold risk of suicidality among young homo/bisexual men vs their heterosexual counterparts, at levels concordant with meta-analyses of international population-based studies (King et al., 2008; Marshal et al., 2011). As such, these findings constitute further evidence on the importance of sexual orientation and suicidality. Additional European research and monitoring on this issue would be particularly welcome, given possible regional differences and the modest evidence base to date. More urgently, we hope such findings will motivate key stakeholders to support measures addressing suicidality among sexual minorities. Gay organizations need to continue their efforts in raising awareness about this issue both inside the gay community as well as among policy and professional stakeholders. Suicide prevention and mental health programs need to address the relevance of sexual orientation in their work.

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Contributors

Jen Wang designed the Geneva Gay Men's Health Survey (GGMHS), performed the literature review, designed the statistical analysis, analyzed the data from GGMHS, and wrote the manuscript. Michael Häusermann participated in the design of the Geneva Gay Men's Health Survey, led the data collection, and contributed to the discussion of the results. Hans Wydler designed the Swiss Recruit Survey (ch-x) and performed the statistical analysis with that dataset. Meichun Mohler-Kuo performed the statistical analysis with the Swiss Multicenter Adolescent Survey on Health (SMASH). Mitchell Weiss contributed to the protocol and advised with his expertise at all steps. All authors contributed to and have approved the final manuscript.

Conflicts of interest

None.

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References

- Bertolote JM, Fleischmann A, DeLeo D, Bolhari J, Botega N, De Silva D, et al. Suicide attempts, plans, and ideation in culturally diverse sites: WHO SUPRE-MISS community survey. *Psychological Medicine* 2005;35:1457–65.
- Bille-Brahe U, editor. WHO/EURO multicentre study on parasuicide: facts and figures. Copenhagen: WHO Regional Office for Europe; 1999.
- Brennan DJ, Ross LE, Dobinson C, Veldhuizen S, Steele LS. Men's sexual orientation and health in Canada. *Canadian Journal of Public Health* 2010;101(3):255–8.
- Bolton S-L, Sareen J. Sexual orientation and its relation to mental disorders and suicide attempts: findings from a nationally representative sample. *Canadian Journal of Psychiatry* 2011;56(1):35–43.
- Chakraborty A, McManus S, Brugha TS, Begginton P, King M. Mental health of the non-heterosexual population of England. *British Journal of Psychiatry* 2011;198:143–8.
- Chishti P, Stone DH, Corcoran P, Williamson E, Petridou E, EUROSAVE Working Group. Suicide mortality in the European Union. *European Journal of Public Health* 2003;13(2):108–14.
- Cochand P, Bovet P. HIV infection and suicide risk: an epidemiological inquiry among male homosexuals in Switzerland. *Social Psychiatry and Psychiatric Epidemiology* 1998;33(5):230–4.
- Cochand P, Moret P, Singy P. Incidence du développement de l'identité sexuelle sur les risques de contamination par le VIH chez les homosexuels et bisexuels de 25 ans et moins en Suisse romande. Lausanne: Institut universitaire de médecine sociale et préventive; 2000.
- Cochran SD, Mays VM. Lifetime 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(4):573–8.
- D'Augelli AR, Herschberger SL, Pilkington NW. Lesbian, gay, and bisexual youth and their families: disclosure of sexual orientation and its consequences. *American Journal of Orthopsychiatry* 1998;68(3):361–71.
- de Graaf R, Sandfort TGM, ten Have M. Suicidality and sexual orientation: differences between men and women in a general population-based sample from the Netherlands. *Archives of Sexual Behavior* 2006;35(3):253–62.
- Delbos-Piot I, Narring F, Michaud P-A. La santé des jeunes hors du système de formation: comparaison entre jeunes hors formation et en formation dans le cadre de l'enquête sur la santé et les styles de vie des 15-20 ans en Suisse Romande. *Santé Publique* 1995;1:59–72.

- Evans E, Hawton K, Rodham K, Deeks J. The prevalence of suicidal phenomena in adolescents: a systematic review of population-based studies. *Suicide and Life-Threatening Behavior* 2005;36:239–50.
- Fergusson DM, Horwood LJ, Beautrais AL. Is sexual orientation related to mental health problems and suicidality in young people? *Archives of General Psychiatry* 1999;56:876–80.
- Friedman MS, Marshal MP, Stall R, Cheong JW, Wright ER. Gay-related development, early abuse and adult health outcomes among gay males. *AIDS and Behaviour* 2008;12:891–902.
- Gilman ST, Cochran SD, Mays VM, Hughes M, Ostrow D, Kessler RC. Risk of psychiatric disorders among individuals reporting same-sex sexual partners in the National Comorbidity Survey. *American Journal of Public Health* 2001;91:933–9.
- Haas AP, Eliason M, Mays VM, Mathy RM, Cochran SD, D'Augelli AR, et al. Suicide and suicide risk in lesbian, gay, bisexual, and transgender populations: review and recommendations. *Journal of Homosexuality* 2011;58(1):10–51.
- Hanner H. (2002). *Psykisk hälsa och ohälsa hos ungdomar 16–24 år som attraheras av personer av sitt eget kön: En enkätundersökning*. PhD thesis. Stockholm: Stockholm University.
- Hawton K, Arensman E, Wasserman D, Hultén A, Bille-Brahe U, Bjerke T, et al. The relationship between attempted suicide and suicide rates among young people in Europe. *Journal of Epidemiology and Community Health* 1998;52:191–4.
- Hegna K, Kristiansen HW, Moseng BU. Levekår og livskvalitet blant lesbiske kvinner og homofile menn. Rapport 1/99. Oslo: Norsk institutt for forskning om oppvekst, velferd og aldring (NOVA); 1999.
- Hegna K, Wichstrøm L. Suicide attempts among Norwegian gay, lesbian and bisexual youths general and specific risk factors. *Acta Sociologica* 2007;50(1):21–37.
- Herrell R, Goldberg J, True WR, Ramakrishnan V, Lyons M, Eisen S, et al. Sexual orientation and suicidality: a co-twin control study in adult men. *Archives of General Psychiatry* 1999;56:867–74.
- Hintikka J, Viinamäki H, Tanskanen A, Kontula O, Koskela K. Suicidal ideation and parasuicide in the Finnish general population. *Acta Psychiatrica Scandinavica* 1998;98(1):23–7.
- Jeannin A, Narring F, Tschumper A, Bonivento LI, Addor V, Butikofer A, et al. Self-reported health needs and use of primary health care services by adolescents enrolled in post-mandatory schools or vocational training programmes in Switzerland. *Swiss Medical Weekly* 2005;135:11–8.
- Jouvin É, Beaulieu-Prévost D, Julien D. Minorités sexuelles: des populations plus exposées que les autres? In: Guilbert P, Gauthier A, editors. *Baromètre Santé 2005: Attitudes et comportements de santé*. Paris: Institut Nationale de Prévention et d'Éducation en Santé; 2007. p. 271–84.
- Kann L, O'Malley Olsen E, McManus T, Kinchen S, Chyen D, Harris WA, et al. Sexual identity, sex of sexual contacts, and health-risk behaviors among students in grades 9–12: youth risk behavior surveillance, selected sites, United States, 2001–2009. *Morbidity and Mortality Weekly Report* 2011;60(7):1–133.
- Kessler RC, Andrews G, Mroczek D, Üstün B, Wittchen H-U. The world health organization composite international diagnostic interview short-form (CIDI-SF). *International Journal of Methods in Psychiatric Research* 1998;7:171–85.
- King M, Semlyen J, Tai SS, Killaspy H, Osborn D, Popelyuk D, et al. A systematic review of mental disorder, suicide, and deliberate self-harm in lesbian, gay and bisexual people. *BMC Psychiatry* 2008;8:70.
- Kjøller M, Helweg-Larsen M. Suicidal ideation and suicide attempts among adult Danes. *Scandinavian Journal of Public Health* 2000;28(1):54–61.
- Kovess-Masfety V, Boyd A, Haro JM, Vilagut G, Lepine J-P, Gasquet I, et al. High and low suicidality in Europe: a fine-grained comparison of France and Spain within the ESEMeD surveys. *Journal of Affective Disorders* 2011;133(1–2):247–56.
- Kulkin HS, Chauvin EA, Perle GA. Suicide among gay and lesbian adolescents and young adults: a review of the literature. *Journal of Homosexuality* 2000;40(1):1–29.
- Marshal MP, Dietz LJ, Friedman MS, Stall R, Smith HA, McGinley J, et al. Suicidality and depression disparities between sexual minority and heterosexual youth. *Journal of Adolescent Health* 2011;49:115–23.
- Mathy RM, Cochran SD, Olsen J, Mays VM. The association between relationship markers of sexual orientation and suicide: Denmark, 1990–2001. *Social Psychiatry and Psychiatric Epidemiology* 2011;46:111–7.
- Mayock P, Bryan A, Carr N, Kitching K. Supporting LGBT lives: a study of the mental health and well-being of lesbian, gay, bisexual and transgender people. Dublin: National Office of Suicide PreventionGay and Lesbian Equality Network and BeLonG To Youth Service; 2009.
- McManus S, Meltzer H, Brugha T, Bebbington P, Jenkins R, editors. *Adult psychiatric morbidity in England, 2007: results of a household survey*. Leeds: NHS Information Centre for Health and Social Care; 2009.
- McNamee H. Out on your own: an examination of the mental health of young same-sex attracted men. Belfast: The Rainbow Project; 2006.
- Mohler-Kuo M, Wydler H, Zellweger U, Gutzwiller F. Differences in health status and health behaviour among young Swiss adults between 1993 and 2003. *Swiss Medical Weekly* 2006;136:464–72.
- Narring F, Stronksi Huwiler SM, Michaud P-A. Prevalence and dimensions of sexual orientation in Swiss adolescents: a cross-sectional survey of 16 to 20-year-old students. *Acta Paediatrica* 2003;92:233–9.
- Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, et al. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *British Journal of Psychiatry* 2008;192:98–105.
- Paykel ES, Myers JK, Lindenthal JJ, Tanner J. Suicidal feelings in the general population: a prevalence study. *British Journal of Psychiatry* 1974;124:460–9.
- Ramsey RF, Tremblay PJ. Gay, lesbian, bisexual & transgender "Attempted Suicide" incidences/risks suicidality studies from 1970 to 2011. Available at, <http://people.ucalgary.ca/~ramsay/attempted-suicide-gay-lesbian-all-studies.htm#All-Studies>; 2011. accessed on 04.06.11.
- Remafedi G, Farrow J, Deischer RW. Risk factors for attempted suicide in gay and bisexual youth. *Pediatrics* 1991;87:869–75.
- Remafedi G, French S, Story M, Resnick MD, Blum R. The relationship between suicide risk and sexual orientation: results of a population-based survey. *American Journal of Public Health* 1998;88:57–60.
- Rey Gex C, Narring F, Ferron C, Michaud P-A. Suicide attempts among adolescents in Switzerland: prevalence, associated factors and comorbidity. *Acta Psychiatrica Scandinavica* 1998;98:28–33.
- Russell ST, Toomey RB. Men's sexual orientation and suicide: evidence for adolescent-specific risk. *Social Science & Medicine*; 2010:1–7. Available online 30 August 2010.
- Saewyc EM. Contested conclusions: claims that can and cannot be made from the current research on gay, lesbian, and bisexual teen suicide attempts. *Journal of LGBT Health Research* 2007;3(1):79–87.
- 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(3):541–6.
- Statens Folkhälsoinstitut. Homosexuella, bisexuella och transpersoners hälsosituation: Återrapportering av regeringsuppdrag att undersöka och analysera hälsosituationen bland hbt-personer. Stockholm: Statens Folkhälsoinstitut; 2005.
- Turner C, Ku L, Lindberg L, Pleck J, Sonenstein F. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. *Science* 1998;280:867–973.
- 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(11):494–9.
- Wang J, Häusermann M, Ajdacic-Gross V, Aggleton P, Weiss MG. High prevalence of mental disorders and comorbidity in the Geneva Gay Men's Health Survey. *Social Psychiatry and Psychiatric Epidemiology* 2007;42:414–20.
- Wang J, Häusermann M, Vounatsou P, Aggleton P, Weiss MG. Health status, behavior, and care utilization in the Geneva Gay Men's Health Survey. *Preventive Medicine* 2007;44:70–5.
- Warner J, McKeown E, Griffin M, Johnson K, Ramsay A, Cort C, et al. Rates and predictors of mental illness in gay men, lesbians and bisexual men and women: results from a survey based in England and Wales. *British Journal of Psychiatry* 2004;185:479–85.
- Weissman MM, Bland RC, Canino GJ, Greenwald S, Hwu H-G, Joyce PR, et al. Prevalence of suicide ideation and suicide attempts in nine countries. *Psychological Medicine* 1999;29:9–17.
- Wichstrøm L, Hegna K. Sexual orientation and suicide attempt: a longitudinal study of the general Norwegian adolescent population. *Journal of Abnormal Psychology* 2003;112(1):144–51.
- Wydler H. Sport, Freizeit, Körper und Gesundheit. *Gesundheitliche Lebensstile 20-Jähriger*. Glarus/Chur: Rüeegger; 2011.