Adverse life experiences among men who have sex with men: Findings from a cross-sectional population-based survey in seven sites across Asia-Pacific[1,2]

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Brief Abstract: This paper presents population-based, cross-sectional data on men who have sex with men (MSM) in seven sites across five countries in the Asia-Pacific region: Cambodia, China, Indonesia, Sri Lanka and Papua New Guinea-Bougainville. We examine the prevalence of male-male consensual sex in the seven sites, and then compare socio-demographic and relationship characteristics of this group with non-MSM men in the pooled population. Comparison of adverse life experiences of MSM respondents with non-MSM respondents demonstrates how MSM face different constellations of risk in terms interpersonal violence exposure and health outcomes throughout their lives. This paper argues that health promotion efforts across the life course – from childhood protection to the prevention of sexual violence victimization – must take into account dimensions of sexuality in order to address the specific risks faced by MSM.

Keywords: MSM, violence, health, sexual minority, human rights, Asia-Pacific

Introduction

This article contributes to the literature of MSM and health in the Asia-Pacific context, drawing from comparable population-based, cross-sectional data with men from seven sites across the Asia-Pacific region to understand differences between MSM and other men in the population, using a consistent definition of MSM across all sites. The article examines socio-economic disparities, odds of experiencing adverse life incidents related to interpersonal violence (including childhood abuse, homophobic violence and sexual violence victimization), and health outcomes and practices.

Study design

This article uses data from the UNDP, UNFPA, UN Women and UNV Multi-country Study on Men and Violence in Asia-Pacific, a comparable population-based cross-sectional survey implemented between 2010 – 2013 and coordinated by Partners for Prevention, a regional joint UNDP, UNFPA, UN Women and UNV gender-based violence prevention programme. The Multi-country Study on Men and Violence was designed to examine men's perpetration of violence against women and associated factors including men's health over the life course, relationship and sexual history, victimization history, gendered attitudes and beliefs, and general demographic information, among others. The study team used multi-stage cluster sampling methods to obtain representative samples of randomly-selected men aged 18 – 49, using

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standardised structured questionnaires in all study sites to ensure cross-site comparable data. The combined data presented in this paper takes into account the multi-stage structure of the survey, with stratification by site within a country and enumeration areas as clusters. All interviews were conducted face-to-face in local languages by trained male interviewers using Personal Digital Assistants (PDAs) to enter respondents' answers. The most sensitive questions, including questions pertaining to homosexual activities and same-sex preferences, were self-administered by the respondents themselves, using audio-enhanced functions on the PDAs. In the China site, the entire survey was self-administered to ensure privacy. The average response rate across all seven sites was 85.1%, ranging from 94.5% in the Indonesia rural site to 58.7% in Sri Lanka[3]. The study received ethics approval in 2010 from the Medical Research Council of South Africa Ethics Committee, as well as approval from national ethics boards in each country where the study was conducted. Full details of the study methodology, including ethical and safety standards, have been presented elsewhere (Fulu et al. 2013a; Fulu et al. 2013b; Jewkes et al. 2013).

Defining the outcome

MSM was defined as any self-reported same-sex sexual attraction and/or any self-reported lifetime consensual same-sex behaviours (oral, anal, thigh or masturbatory sex) with a man.[4] Non-consensual sex was not included in the variable derivation. The survey did not ask men their self-reported sexual identity and so these data were not included in the MSM classification, which is a limitation of the subsample parameters. Although the UN Multi-country Study methodology also was implemented in Bangladesh, the nationally adapted survey did not include the questions on same-sex activities, and so the Bangladesh data was omitted from this analysis.

Independent variables

The following sets of variables were used to measure adverse life experiences and health outcomes: victimization history, male-on-male sexual violence perpetration, mental health and well being and substance use.

Victimization history: To assess childhood experiences of abuse, the survey used a modified version of the Childhood Trauma Questionnaire (Berstein et al. 1994) to measure four dimensions of trauma and adversity before age 18 using 11 questions on emotional abuse or neglect, physical abuse, sexual abuse or witnessing partner abuse of his mother. Response options included never (1), sometimes (2), often (3) or very often (4). A scale was created ranging from scores of 11 to 44. The mean score was 14.25 and Cronbach's Alpha was 0.70. For the multivariate model presented in Table 3, the child abuse measure also was separated into different types of abuse to calculate crude odds ratios. Each type of child abuse was measured as experiencing one or more incident of that form of abuse. To measure past year victimization of violence outside the home, respondents answered yes to one or more of the following experiences: "In the past 12 months, have you experienced any of the following forms of violence outside the home: been punched or hit, been threatened with a knife or other weapon (excluding firearms), been threatened with a gun?" The survey asked two questions to assess

[3] The low response rate in Sri Lanka was likely due in part to men's work-related absences and in part to personal security and safety concerns about allowing unknown individuals into homes for interviews, given the post-conflict climate.

[4] Although previous research among MSM has limited variable measurement to oral and anal only (see for example Dunkle et al. 2013), analysis of difference between an oral/anal only measure of MSM and an inclusive behavioural measure (oral, anal, thigh and masturbatory sex) found no significant difference on key independent variables.

lifetime experiences of homophobic abuse: “Have you ever been called by names or faced derogatory remarks because you were thought to be effeminate or “sissy” and “Have you ever been subjected to threats of violence or actual violence because you were thought to be effeminate, gay, attracted to men and/or have sex with men?” The term “sissy” was translated to reflect locally specific language around homophobic language. The first question on homophobic violence was not asked in the Cambodia survey. Lifetime history of sexual violence victimization was queried as “Did a man ever persuade or force you to have sex or do something sexual when you did not want to?” Men who responded yes were asked “How many times has this happened?” with response categories of “once”, “2-3 times” or “more than 3 times”.

Male-on-male sexual violence perpetration: Lifetime single perpetrator history of male-on-male sexual violence perpetration was asked as “Have you ever done anything sexual with a boy or man when he didn’t consent or you forced him?” or “Have you ever done anything sexual with a boy or man when you put your penis in his mouth or anus when he didn’t consent or you forced him?” Possible responses included “Never”, “Once” or “More than once”. Lifetime multiple perpetrator history of male-on-male sexual violence perpetration was queried as “Have you and other men ever had sex with a man at the same time when he didn’t consent to sex or you forced him?” with the same response options as above. Male-on-male sexual violence perpetration is presented here as responding yes to any of the above three questions.

Gang violence: Men’s engagement in communal forms of violence, or involvement in gang activity, was measured using a single question on whether they had ever participated once or more than one time gang activity (translated to use the local term for collective violent groups). Response categories included “never”, “once”, “2-3 times” or “more than three times.” Gang involvement was classified as being involved in gang activity at least one time.

Mental health: Men’s current depressive symptoms were measured using an abbreviated version of the Centre for Epidemiologic Studies (CES) Depression scale (cut off point: >7). The mean score was 14.58 and Chronbach’s Alpha was 0.84.

*Alcohol abuse***:** Current alcohol abuse was measured using a dummy variable based on the modified AUDIT scale, combining data on frequency of drinking, number of drinks consumed, frequency of binge-drinking, feelings of guilt or remorse after drinking and failure to do what is expected due to alcohol consumption.

Drug use: Men’s drug use was measured by a dummy variable for whether the respondent reported any use of drugs in the past twelve months.

Life satisfaction: Men’s overall life satisfaction was measured by three questions, each having a four-point Likert response option ranging from strongly agree to strongly disagree (no neutral option): “The conditions in my life are excellent,” “I am satisfied with my life,” and “So far I have gotten the important things I want in life.” Scores ranged from 3 to 12. The mean score for the full sample was 6.4 and Chronbach’s alpha was 0.73.

Socio-demographic: Age was measured in tertiles of 18 – 24, 25 – 34 and 35 – 49. Education level was coded using a dummy variable based on whether the individual had completed any high school level education. Socio-economic status was measured using a categorical poverty score (with values from 2 to 8) based on reported food insecurity and difficulty mobilizing resources in case of an emergency. Unemployment was measured using a dummy variable

coded 0 for employed at the time of the survey and 1 for unemployed at the time of the survey. Marital status was coded using a dummy variable for whether the respondent had ever married or cohabited with a woman. Last sex not with main partner was coded as any response to the question "the last time you had sex, who was it with?" except for "wife/main partner".

Statistical Analysis

The study design provided a sample that was self-weighted for each site. We used STATA/IC 13.0 for all procedures. The survey design was accounted for in analysis with stratification by site within each country, and enumeration areas used as clusters. Across the pooled sample, a number of men did not respond to *any* of the questions used to categorize the MSM subsample (141 men, 1.41% of the total sample). Of these men, 95% had missing information on more than half of the key variables of interest. To avoid imputing based on assumptions of MSM behavior, a total of 141 men (1.41%) were dropped from the regional pooled sample.[5] Anyone who responded to at least one question used to code MSM was retained. Missing values on the depression scale were imputed using the mean value.[6] No other imputations were conducted.[7]

We present the population prevalence of men who have sex with men by country and site. In presenting comparisons on variables of interest between MSM and other men, we pooled data from all countries and weighted the sample based on population prevalence of MSM[8]. Pearson's χ^2 tests were used to analyse bivariate relationships between men who reported same-sex sexual attraction and behaviour (MSM), with all independent variables. Life health and adversity correlates of consensual same-sex sexual behaviour/attraction compared to other men in the sample were measured using multivariate logistic regression models. Correlates were included on the basis of theoretical relevance and statistical significance ($p<.05$) at the bivariate level. All models were adjusted for age, education and socio-economic status that have been shown to be associated with adverse life experiences among this sample (Fulu et al. 2013a). Table 2 presents adjusted odds ratios for socio-demographic and sexual characteristics of MSM compared to other men in the pooled regional sample.[9] Table 3 summarizes odds of adverse life experiences for both MSM and non-MSM, including victimization and perpetration of violence. We used Hosmer-Lemeshow tests to assess model fit for both multivariate logit models. Results show strong fit with $p>0.5$ for both models. Table 4 provides further information on the overlap between victimization and perpetration across both groups of men.

Results

[5] Zero order test of differences across sites did find a significant difference of men who were dropped by country ($p<0.0001$), although this is likely due to the outlier effect of Sri Lanka with 3.65% of men missing on the MSM-related questions. These men were more likely to be older and married, and less likely to have witnessed abuse of their mother or have depression scores above the cut-point. Given the low percentage of men dropped from the sample, it is unlikely that these dropped observations would significantly bias the results. No other variables were significantly different between the dropped observations and the full sample.

[6] Only 1% of men had missing values for the CES-D scale, with no significant difference between MSM and non-MSM. Among those with missing values on one or more question in the CES-D scale, over half had missing values on all questions. Given this distribution of missing values, an average score was imputed.

[7] Percent of missing values on all independent variables ranged from 0.01% (age) to 1.71% (alcohol abuse), except age at first sex among men who reported ever having heterosexual sex (4.47% missing). No significant differences by sample stratification (MSM) were found for any of the variables except homophobic violence (missing: 1.44%) and life satisfaction (missing: 0.96%). For both these independent variables, non-MSM men were more likely to have missing values.

[8] Where significant differences with respect to socio-demographic and adverse life incidence variables among MSM as compared to non-MSM were found between countries, it is noted in the text.

[9] The model was separately run at the country level to test for differences across sites. These data are not presented here.

The data point to a significant range in the prevalence of MSM in populations across the seven sites. Table 1 shows population prevalence per site, and by country (where sites were not nationally representative) of men who reported any sexual attraction or consensual sexual practices with men. Prevalence by site ranged from 4% in Indonesia Site 1 to 16.2% PNG-Bougainville. Prevalence of reported same-sex attraction and behaviours across the combined regional sample was 10.4%. With the exception of Cambodia, these prevalence rates are site-specific estimates and are not nationally representative.

Table 2 shows differences in socio-demographic characteristics and relationship and sexual practices between MSM and non-MSM. Both models show no significant difference in the age distribution between the two groups of men, with 42% of MSM ages 35–49. MSM were significantly less likely to have attended high school, even after adjusting for all other socio-demographic characteristics (aOR= 0.5, p<0.00). Similarly, MSM were significantly more likely to have lower poverty scores: 12.7 % of MSM fell into the lowest poverty tertile, as compared to 5.1% of other men in the population (p< 0.00), after controlling for other socio-demographic variables. There was no difference in employment or work stress between the two groups of men. Nor was there a difference in marriage or cohabiting patterns with 69.5% of MSM and 71.6% of non-MSM in the sample reporting that they had ever been married or cohabited with a woman. No significant differences emerged on patterns of sexual debut between MSM and other men in the sample: the majority of men in both groups reported first (heterosexual) activity after age 18 (86.1% and 88.9%, respectively). At the same time, among MSM, 30.8% reported first sex with a man when younger than 15, 38.0% were between 15 and 19 years old and 31.2% were above 20 years old (data not shown). Men in the MSM group were 2.5 times more likely to report that their last sexual engagement was with someone other than their primary female partner (p<0.00) after adjusting for all socio-demographic characteristics.

Multi-variate logit models of reported lifetime experiences of adversity and perpetration of violence among MSM compared to other men in the sample show that MSM experience different levels of risk for most adverse life experiences (Table 3).[10] While the fully adjusted model shows no significant difference in childhood trauma scores between the two groups of men, zero order analysis of emotional abuse and neglect, physical abuse, sexual abuse and witnessing mother's abuse show that MSM had higher exposure to all forms of child abuse, except physical abuse, as compared to other men in the sample. MSM were significantly more likely to experience a number of other adverse life experiences in childhood and adulthood, fully adjusting for socio-demographic variables and other life experiences. In school or community settings, men in the MSM group were more likely to be teased or bullied as a child (OR 1.5 p<0.001) than other men in the sample although this was not significant at the 0.05 level after adjusting for all other adverse life experiences. MSM were more likely to be a victim of violence outside the home in the past twelve months (aOR 1.5 p<0.001) and more likely to experience homophobic abuse (aOR 1.8, p=0.004) in their lifetime. Men in the MSM group also were more likely to report ever participating in community violence (aOR 1.4, p=0.015). At the time of survey, 19.4% of MSM and 13.6% of non-MSM reported problem drinking. These differences were not significant between the two groups at the multivariate level. However, MSM had higher odds than non-MSM of reporting past year drug use (aOR 1.8, p<0.001). Comparing mental health outcomes, MSM were also had higher odds for depression (aOR 1.3, p=0.010) and lower levels of overall life satisfaction (aOR .9, p<0.001).

[10] It is important to note that while conceptually, MSM serves as the outcome variable, substantively these tables show associations between men's reported sexual attraction and behaviour and independent variables, rather than serving to predict whether men will 'be' MSM or not.

Table 3 also provides population prevalence and patterns of men's victimization and perpetration of male-on-male sexual violence, adjusted for socio-demographic variables and other adverse life experiences. In this cross-sectional context, MSM were at considerably higher risk of sexual violence victimization than other men in the sample. Among the sample of men who did not report same-sex attractions or behaviours, 2.8% reported victimization on male-on-male sexual violence. This figure rose to 16.3% among men in the MSM group (aOR 4.1, $p<0.001$). Although not included in the full model, prevalence data show that MSM were also exposed to more frequent sexual violence victimization than other men in the population. Data on overall male-on-male sexual violence perpetration show similar patterns as those for victimization. Prevalence of lifetime male-male sexual violence perpetration among the general population was 2.2% as compared to 16.9% among the MSM group (aOR 3.8, $p<0.001$). Among men who reported male-on-male sexual violence perpetration, 48.5% of MSM as compared to 22% of other men reported past year perpetration of male rape, and 10% of MSM as compared to 1.2% of other men reported perpetration of male-male sexual violence before the age of 20.

Table 4 shows the overlaps between men who reported sexual violence victimization and men who reported perpetration of single or multiple perpetrator male rape for the full and stratified samples. Among all men in the full sample, 4.2% reported victimization of male-on-male sexual violence, 3.8% reported perpetration of male-on-male sexual violence and 0.9% reported both victimization and perpetration. When comparing between MSM and non-MSM, these percentages were significantly higher among the MSM population, with 6.1% of MSM reporting both victimization and perpetration of male-on-male sexual violence as compared to 0.3% of other men in the sample.

Discussion

Probability-based population data from seven sites across the Asia-Pacific region point to higher exposure to adverse life experiences across the life course among MSM than their counterparts. These data suggest that MSM face substantial adverse life experiences throughout their lives, compared to other men in the population, which have implications for rights and health promotion efforts. Four key areas of difference between MSM and non-MSM emerged from the data: divergence across socio-economic indicators; exposure to childhood experiences of trauma; and experiences of structural homophobia and other forms of adult trauma (including sexual violence victimization and perpetration) and health outcomes.

The implications of these data for public health programme and policies are two-fold. First, these data provide population-based evidence of increased risk among MSM for a range of adverse life incidents across these seven sites in the Asia-Pacific region. The evidence points to the need for targeted public health interventions for this group, building off the strong public health infrastructure developed in response to the HIV epidemic. This includes child protection that addresses the systematic vulnerabilities of children who exhibit or engage in same-sex preferences and relationships, the need to address sexual violence and its effects on health and well-being (including but not limited to HIV risk), particularly among MSM youth, and integration of efforts to tackle structural homophobia and sexual inequality, whether direct or indirect, across multiple sectors from schools to workplaces. Second, and moving to more generalized health promotion efforts, the data suggest the importance of integrating sexuality into general public health promotion programmes that work with men. These data unequivocally contend that sexuality is a critical axis of differentiation among groups of men, and this needs to be considered in the design and implementation of programmes that engage

men and boys. This underscores the need for more population-based data on MSM and women who have sex with women (WSW) in the Asia-Pacific region. While the variance in country prevalence of MSM likely point toward the diversity of regional socio-cultural environments that facilitate or hinder opportunities for men to engage in and/or report same-sex relationships, these differences in prevalence suggests the need for more nationally representative studies using updated survey methods to capture MSM populations. One way to do this would be to integrate questions around same-sex sexual preferences and practices into the numerous general public health surveys implemented throughout the region.

Strengths and limitations

These data uniquely capture a large population-based sample of MSM, through use of comparable multi-country surveys from what is arguably the largest Asia-Pacific regional data set on men, health and violence to date (Fulu et al. 2013a). The data set provided a statistically large enough randomly sampled group of MSM that enabled complex analysis on differences in adverse life experiences using a consistent definition of MSM across sites. Finally, the use of audio-enhanced PDAs to self-administer questions around same-sex preferences and behaviours likely allowed for more honest and open disclosure of sexual preferences and/or practices that are widely stigmatized (in some cases, criminalized) across the countries included in this study.

This analysis also has limitations. In particular, the original UN Multi-country Study on Men and Violence in Asia-Pacific was not designed to analyze data on male-male sexual behaviours. Thus, the questions on this topic missed some important scopes of inquiry, including for example behaviours and practices that may be more specific to MSM communities (e.g. same-sex intimate partnerships). Further, due to the limits of survey questions, the definition of MSM fails to capture self-reported sexual identification, a key criteria for defining MSM populations and capturing local complexity and diversity (Young and Meyer 2005).

Conclusion

Men who have sex with men face different constellations of risk in terms of health and interpersonal violence exposure throughout their lives, as compared to all other men in this population-based sample of men across seven sites in Asia-Pacific. The divergent experiences of MSM as compared to other men in the population show that men have different life experiences that are – in part – shaped by their sexual identities, attractions and practices. In other words, sexuality stratifies society. At the same time, sexuality intersects with other systems of social stratification, such as gender, to create convergent hierarchies of power and control. The findings underscore the widespread strength of structural homophobia and hegemonic masculinities in shaping men's lives, their experiences of adversity and their health. The paper concludes that health promotion efforts across the life course – from childhood protection to the prevention of sexual violence victimization – must take into account dimensions of sexuality to address the specific risks faced by men who have sex with men. Global health efforts that attempt to "engage boys and men" to prevent violence against women, to promote gender equality and to foster social justice must factor sexuality into the discussion.

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Table 1. Prevalence of men who have sex with men in Cambodia, China, Indonesia, Papua New Guinea, Sri Lanka per site

Country/Site*	Percent reported sexual attraction to men or ever engaged in consensual male-male sexual activity (MSM)	Percent reported sexual attracted to women or unsure, and never engaged in consensual male-male sexual activity (non-MSM)	Total n
Cambodia	6.7	93.3	1,768
China	14.3	85.7	976
Indonesia Site 1	4.0	96.0	856
Indonesia Site 2	7.8	92.2	799
Indonesia Site 3	7.9	92.2	879
Indonesia sites combined	6.5	93.5	2,534
PNG	16.2	83.8	851
Sri Lanka	15.7	84.3	1,431
Total Combined	10.4	89.6	7,560

Table 2. Socio-demographic characteristics, sexual satisfaction and sexual activity outside marriage, combined data set[11]

Characteristic	MSM Percent (n)	Non-MSM Percent (n)	Odds Ratio (95% CI)	*p*-value	Adjusted Odds Ratio (95% CI)	P-Value
Age						
18-24	27.7 (218)	26.0 (1,782)	*Ref*		*Ref*	
25-34	30.3 (238)	34.0 (2,333)	0.8 (0.7 – 1.0)	0.06	0.9 (0.7 – 1.2)	0.34
35-49	42.0 (330)	40.0 (2,740)	1.0 (0.8 – 1.1)	0.88	0.9 (0.7 – 1.3)	0.72
Attended high school	62.3 (490)	73.5 (5,038)	0.6 (0.5 – 0.7)	0.00	0.5 (0.4 – 0.7)	0.00
SES						
Low (poorer) (scores 2 – 3)	12.7 (99)	5.1 (343)	*Ref*		*Ref*	
Medium (scores 4 - 6)	57.8 (449)	61.5 (4,145)	0.4 (0.3 – 0.5)	0.00	0.4 (0.3 – 0.5)	0.00
High (scores 7 – 8)	29.5 (229)	33.4 (2,254)	0.4 (0.3 – 0.5)	0.00	0.3 (0.2 – 0.4)	0.00
Unemployed	19.3 (152)	17.2 (1,182)	1.2 (0.9 – 1.4)	0.16	1.0 (0.8 – 1.3)	0.99
Work Stress						
Low	12.7 (85)	11.1 (659)	*Ref*		*Ref*	
Medium	57.6 (385)	63.3 (3,759)	0.8 (0.6 – 1.1)	0.12	0.9 (0.7 – 1.2)	0.43
High	29.6 (198)	25.7 (1,525)	1.0 (0.7 – 1.4	0.97	1.1 (0.8 – 1.5	0.55
Ever married/cohabited with a woman	69.5 (546)	71.6 (4,911)	0.9 (0.8 – 1.1	0.24	0.8 (0.6 – 1.2)	0.27
Has one or more children	66.3 (461)	65.7 (4,135)	1.0 (0.9 – 1.2)	0.73	1.0 (0.8 – 1.3	0.96
Age first (heterosexual) sex					-	-
<16	4.4 (26)	3.2 (168)	*Ref*		-	-
16 - 17	9.6 (57)	7.9 (418)	0.9 (0.5 – 1.4)	0.59	-	-
18+	86.1 (513)	88.9 (4,705)	0.7 (0.5 – 1.1	0.09	-	-
Last sex not with main (female) partner	26.0 (149)	14.0 (724)	2.2 (1.7 – 2.7)	0.00	-	-

[11] Fixed effects for site/country were included in all models, not shown.

Table 3. Odds ratios of lifetime experiences of adversity among men who have sex with men, combined sample[†]

Experience of adversity	MSM Percent (n)	Non-MSM Percent (n)	Odds Ratio (95% CI)	*p*-value	Adjusted Odds Ratio (95% CI)	*p*-value
Childhood trauma in home (score range 11 – 44, n=7,636)	15.5 (561)*	14.3 (5,599)*	1.1 (1.07 – 1.12)	<0.001	1.0 (0.98 – 1.04)	0.31
Frequent child emotional abuse and neglect	41.0(322)	29.4 (1,990)	1.2 (1.1 – 1.3)	<0.001	-	-
Child physical abuse	43.1 (339)	39.9 (2,701)	1.2 (1.0 – 1.4)	0.047	-	-
Child sexual abuse	26.6 (209)	12.6 (856)	2.4 (1.9 – 3.0)	<0.001	-	-
Witnessed abuse of mother	32.0 (251)	24.6 (1,666)	1.7 (1.4 – 2.0)	<0.001	-	-
Teased or bullied as child	38.0 (298)	28.7 (1,943)	1.5 (1.2 – 1.8)	<0.001	1.2 (1.0 – 1.4)	0.09
Victim of violence outside the home (last 12 months)	28.9 (226)	14.2 (962)	2.4 (2.0 – 3.0)	<0.001	1.5 (1.2 – 1.0)	<0.001
Victim of homophobic abuse	11.4 (89)	2.2 (150)	5.7 (4.1 – 7.8	<0.001	1.8 (1.2 – 2.6)	0.004
Ever participated in collective violence (gang)	21.0 (164)	9.5 (644)	2.5 (2.0 – 3.1)	<0.001	1.2 (1.0 – 1.6)	0.103
Alcohol abuse	19.4 (151)	13.6 (916)	1.5 (1.2 – 1.9)	<0.001	1.0 (0.8 – 1.3)	0.27
Past year drug use	27.9 (218)	9.1 (613)	3.9 (3.2 – 4.7)	<0.001	1.8 (1.4 – 2.2)	<0.001
Depression	33.6 (264)	21.3 (1,458)	1.8 (1.6 – 2.2)	<0.001	1.3 (1.1 – 1.6)	0.010
Life satisfaction (continuous, n= 7569)	-	-	.9 (.9 – .98)	0.003	.9 (.87 - .95)	<0.001
Victim of male-male sexual violence (ever)	16.3 (127)	2.8 (189)	6.8 (5.3 – 8.7)	<0.001	4.1 (3.0 – 5.3)	<0.001
Frequency victimization of male-male sexual violence (ever)						
Once	51.2 (65)	70.1 (131)	-	-	-	-
2-3 times	28.4 (36)	20.9 (39)	-	-	-	-
3+ times	20.5 (26)	9.1 (17)	-	-	-	-
Perpetration of male-on-male sexual violence (single or multiple perpetrator)	16.9 (132)	2.2 (150)	8.6 (6.6 – 11.4)	<0.001	3.8 (2.8 – 5.3)	<0.001
Past year any male-on-male sexual violence	48.5 (64)	22 (33)	-	-	-	-
Raped/sexually assaulted man when <20 years	10.0 (77)	1.2 (78)	-	-	-	-

[†] Model also adjusted for age, any high school education attainment, poverty level and site/country.
* Mean values presented

Table 4. Overlaps in victimization and perpetration of male-on-male sexual violence among MSM and non-MSM

	Among all men Percent (n)	MSM Percent (n)	Non-MSM Percent (n)
Victim of male-male sexual violence	4.2 (316)	16.3 (127)	2.8 (189)
Perpetrator of male-male sexual violence	3.8 (288)	16.9 (132)	2.3 (156)
Victim and perpetrator of male-male sexual violence	0.9 (67)	6.1 (48)	0.3 (19)