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ORIGINAL PAPER

Cruising Venues as a Context for HIV Risky Behavior Among Men Who Have Sex With Men

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Abstract We examined differences in sexual risk behaviors, HIV prevalence, and demographic characteristics between men who have sex with men (MSM) who visit different types of venues to meet sexual partners, and identified correlates of high-risk behaviors. A cross-sectional behavioral survey was conducted with a venue-based sample of 1011 MSM in Portugal. Overall, 36.3 % of MSM usually visit cruising venues to meet sexual partners (63.7 % only visit social gay venues). Cruising venues' visitors reported higher HIV prevalence (14.6 % [95 % CI 11–18 %] vs. 5.5 % [95 % CI 4–7 %]). Visiting cruising venues was more likely among those older, reporting high number of male sexual partners, group sex, and unprotected anal sex with a partner whose HIV status was unknown. Cruising venues play an important role in increasing risk of HIV transmission among MSM who frequent them. Venue-focused behavioral interventions that promote healthy sexual behaviors are needed.

Keywords HIV · Risk behavior · Men who have sex with men · Cruising venues · Sexual orientation

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Introduction

In most industrialized countries, the incidence rates of HIV infection have declined in the overall population; however, among men who have sex with men (MSM), the incidence of HIV continues to rise (Alkaiyat, Schaetti, Liswi, & Weiss, 2014; Beyrer et al., 2012; UNAIDS, 2012). This trend has been associated with increased laxity in safe sexual practices and adoption of high-risk sexual behaviors due to the perception that HIV/AIDS is less serious in the era of highly active antiretroviral therapy (Aynalem et al., 2006; Beyrer et al., 2012; Le Vu et al., 2012; Vanden Berghe et al., 2011). Therefore, MSM are considered a key population at increased risk of HIV transmission, though different subgroups present disparate levels of HIV/STI risk (Reisner et al., 2009; WHO, 2014).

Lately, considerable attention has been given to the environmental contexts that increase MSM exposure to HIV risk, such as cruising venues where MSM frequently seek sexual partners (Binson et al., 2001; Melendez-Torres, Nye, & Bonell, 2015; Vanden Berghe et al., 2011). These venues include commercial venues (gay bathhouses and sex clubs) and free public spaces (beaches, parks, and toilets) (Binson et al., 2001; Reisen, Iracheta, Zea, Bianchi, & Poppen, 2010). In these settings, MSM frequently seek sex with anonymous or casual partners (Aynalem et al., 2006; Binson et al., 2001; Reisen et al., 2010). Previous studies showed that MSM who visit sex venues are more likely to engage in high-risk sexual behaviors, suggesting that some venue-specific characteristics can significantly influence MSM sexual behaviors (Aynalem et al., 2006; Binson et al., 2001; Reisen et al., 2010; Reisner et al., 2009). These characteristics include physical space, sexual norms, and risk-behavior patterns at the venue (Grov, Golub, & Parsons, 2010; Grov, Hirshfield, Remien, Humberstone, & Chiasson, 2013; Zhao et al., 2013).

Given the association between sex venues and sexual risk found in the literature, a comparison of the characteristics of

MSM subgroups that attend different venues and a deeper understanding of the role of cruising venues in the spread of HIV is extremely important. Such knowledge would help conceive effective tailored and venue-specific prevention strategies.

Our aim was to examine differences in sexual risk behaviors, HIV prevalence, and demographic characteristics between MSM who visit different types of venues to meet sexual partners, and identify correlates of high-risk behaviors.

Method

Participants

A cross-sectional behavioral survey was conducted with MSM in Portugal. A community-based participatory research approach was used (Dias & Gama, 2014; Wallerstein & Duran, 2006), in which a Community Advisory Board (CAB) including representatives of non-governmental and governmental organizations, academics, and MSM was formed and actively participated in all phases of the project, as the study design, elaboration of the questionnaire, results interpretation, and discussion. Community partners were also involved in the data collection process.

There is no adequate sampling frame for this population enabling to draw a probability sample of MSM in Portugal. Therefore, this study used a venue-based sampling method to recruit participants (Muhib et al., 2001). In order to estimate a sample that would be large enough for detailed analyses, the sample size was calculated assuming a hypothetical worst-case prevalence of HIV infection of 50 %, at 95 % confidence level with precision of 3.5 %, which resulted in a sample size estimate of 784 MSM. Initially, a geographic and network mapping was conducted based on a formative research developed by the CAB. The mapping allowed us to list venues where MSM gather and to systematically identify data collection sites. Recruitment teams of outreach workers from local non-governmental organizations working on HIV prevention, including for LGBT, and MSM peers from community-based organizations (CBOs) were sent to those venues and systematically approached potential participants inviting them to participate in the study. The inclusion criteria were being $\geq$18 years old and having had sex (anal or oral) with a man in the last 12 months. Participants were recruited from gay bars/clubs, cafes, local CBOs, and community events. Additionally, the recruited respondents were asked to advertise the study among their social networks and peers. Overall, 1046 MSM were enrolled (665 MSM, 63.6 %, recruited in CBOs and 381 MSM, 36.4 %, recruited in other venues), between January and September of 2011.

Measures

Data were collected in the recruitment sites (in private spaces) through a paper-and-pencil structured questionnaire administered by peers trained for data collection. The questionnaire included closed-ended questions on socio-demographics (age, educational level, occupational status, and income), sexual behaviors (group sex was defined as sex with at least 2 partners simultaneously; unprotected anal sex was defined as having had anal sex without condom in the last 12 months; substance consumption before/during the last sexual intercourse included alcohol and illicit substances), coverage in HIV prevention campaigns (including having been reached with HIV prevention programs in the last 12 months and having received free condoms in the last 12 months), HIV testing, and reported HIV infection. Participants were also asked about venues they usually visit to meet sexual partners. Similar to prior studies, for the purpose of this analysis, "cruising venues" comprised venues where sexual contact on site is possible (gay saunas, beaches and parks); "social gay venues" comprised gay clubs, bars, discos where it is not possible to have sexual contact on site, and internet chats (Binson et al., 2001; Reisen et al., 2010). Although internet chats are technically not venues (i.e., physical spaces), for ease in discussing findings, we use the term "social gay venue" to describe this setting.

The refusal rate was 23.2 %. No significant differences were found between refusals and participants regarding age and education. No information was collected about reasons for refusal.

Anonymity of participants was ensured (no personal identifying information was collected), and confidentiality was guaranteed; informed consent was obtained from all participants. The study was approved by the Ethics Committee for Health of the North Regional Health Administration.

Statistical Analysis

Visitors of cruising venues and of social gay venues were compared across HIV prevalence, sexual risk behaviors, demographic characteristics, and coverage in HIV prevention campaigns. Differences were tested for significance using Pearson's χ^2 and Fisher's exact tests for categorical variables, and ANOVA tests for continuous variables.

We performed bivariate and multivariate logistic regression analyses to measure the association of visiting cruising venues with HIV infection, sexual risk behaviors, and demographic characteristics. We also conducted bivariate and multivariate logistic regression analyses in order to explore the association of high-risk sexual behavior (unprotected anal sex with a partner whose HIV serostatus was unknown) with type of venues visited, self-reported HIV status, and coverage in prevention campaigns. All the variables that remained significantly associated with the variables "visiting cruising venues" and "unpro-

tected anal sex with a partner whose HIV serostatus was unknown" at a significance level of $p < 0.05$ were included in the final multivariate models. Associations were measured calculating the odds ratio (OR) and its 95 % confidence interval (CI). Finally, the Hosmer–Lemeshow goodness-of-fit test was used to assess both models fit. Statistical analyses were conducted using IBM SPSS Statistics 22.0 software.

Results

Overall, 1046 MSM were enrolled in the study. Of these, 1011 responded to the question about the venues that were usually visited to meet sexual partners. The remaining 35 subjects were excluded from analysis. Overall, 644 (63.7 %) MSM reported to visit social gay venues and 367 (36.3 %) to visit cruising venues to meet sexual partners (of the latter, 89.4 % reported to visit both cruising venues and social gay venues).

Demographic and behavioral characteristics are shown in Table 1. In total, 43.2 % of participants were 25–34 years old, and about one third was older; 39.6 % had higher education, 39.4 % secondary, and 21.0 % elementary; 71.5 % were employed, 16.4 % were student, and 10.3 % were unemployed; 58.0 % reported income >1000 euro. MSM who visit cruising venues were significantly older, had lower education, were more frequently unemployed, and reported lower income than MSM who visit social gay venues.

Overall, nearly 25 % of participants had their first anal intercourse at age 15 or younger. The mean number of male sexual partners in the previous year reported by participants was 15.1 ± 36.6. A higher proportion of cruising venues' visitors had their first anal intercourse at age 15 or younger. Also, cruising venues' visitors reported higher mean number of male sexual partners in the previous year. Approximately 70 % of the total participants reported having had sex with occasional partners in the last 12 months, 61.4 % had with regular partners, 26.0 % reported group sex, and 5.4 % had sex with client partners. A greater proportion of cruising venues' visitors reported sex with occasional partners, with client partners and group sex in the past year, while a lower proportion had sex with regular partners. A lower proportion of

Table 1 Type of venues used to meet sexual partners according to participants' demographic characteristics, risk behaviors, and reported HIV infection

	Total	Venues usually visited to meet sexual partners		*p* value
	n (%)	Cruising venues *n* (%)	Social gay venues *n* (%)	
Total	1011 (100)	367 (36.3)	644 (63.7)	
Sociodemographics				
Age (in years)				
18–24	247 (24.5)	62 (16.9)	185 (28.7)	<0.001
25–34	437 (43.2)	151 (41.3)	286 (44.4)	
35–44	206 (20.4)	94 (25.7)	112 (17.4)	
≥45	120 (11.9)	59 (16.1)	61 (9.5)	
Educational level				
Elementary	210 (21.0)	99 (27.5)	111 (17.3)	0.001
Secondary	394 (39.4)	136 (37.8)	258 (40.3)	
Higher	396 (39.6)	125 (34.7)	271 (42.3)	
Occupational status				
Employed	707 (71.5)	271 (75.3)	436 (69.3)	<0.001
Unemployed	102 (10.3)	51 (14.2)	51 (8.1)	
Retired	18 (1.8)	12 (3.3)	6 (1.0)	
Student	162 (16.4)	26 (7.2)	136 (21.6)	
Income				
≤1000 euro	416 (42.0)	172 (48.5)	244 (38.4)	0.002
>1000 euro	575 (58.0)	183 (51.5)	392 (61.6)	
Sexual risk exposures				
Age at first anal intercourse				
≤15	243 (24.8)	108 (30.8)	135 (21.5)	0.001
16–17	249 (25.4)	82 (23.4)	167 (26.5)	
18–20	273 (27.9)	102 (29.0)	171 (27.2)	
≥21	215 (21.9)	59 (16.8)	156 (24.8)	

Table 1 continued

	M (SD)	M (SD)	M (SD)	*p* value
In the last 12M				
Number of male sexual partners	15.1 (36.6)	28.4 (54.8)	7.5 (15.0)	<0.001
	n (%)	*n* (%)	*n* (%)	*p* value
In the last 12M				
Sex with regular partners	608 (61.4)	165 (46.2)	443 (70.0)	<0.001
Sex with occasional partners	690 (70.1)	312 (87.6)	378 (60.1)	<0.001
Sex with client partners	52 (5.4)	30 (8.7)	22 (3.5)	0.001
Sex with sex workers	48 (5.0)	22 (6.4)	26 (4.2)	0.135
Group sex	253 (26.0)	146 (41.2)	107 (17.3)	<0.001
Condom use with regular partners				
Consistent (always)	314 (52.5)	101 (62.3)	213 (48.9)	0.003
Inconsistent (sometimes/ rarely/never)	284 (47.5)	61 (37.7)	223 (51.1)	
Condom use with occasional partners				
Consistent (always)	545 (81.5)	238 (79.1)	307 (83.4)	0.149
Inconsistent (sometimes/ rarely/never)	124 (18.5)	63 (20.9)	61 (16.6)	
Condom use in group sex				
Consistent (always)	205 (83.7)	115 (79.9)	90 (89.1)	0.054
Inconsistent (sometimes/ rarely/never)	40 (16.3)	29 (20.1)	11 (10.9)	
Unprotected anal sex with a partner whose HIV serostatus was unknown	170 (23.7)	89 (33.5)	81 (18.0)	<0.001
Unprotected anal sex with a partner whose HIV serostatus was different from his own	41 (7.0)	18 (9.0)	23 (5.9)	0.168
Substance consumption before/during the last sexual intercourse	356 (35.2)	153 (41.7)	203 (31.5)	0.001
HIV prevention campaigns				
Reached by HIV prevention programs in the last 12M	385 (38.8)	138 (38.0)	247 (39.3)	0.697
Received free condoms in the last 12M	835 (82.7)	324 (88.3)	511 (79.5)	<0.001
HIV testing and reported infection				
Having ever been tested for HIV	889 (88.4)	341 (93.7)	548 (85.4)	<0.001
Reported HIV status				
HIV negative	731 (72.8)	258 (71.1)	473 (73.8)	<0.001
HIV positive	88 (8.8)	53 (14.6)	35 (5.5)	
Don't know	185 (18.4)	52 (14.3)	133 (20.7)	

SD standard deviation, *12M* 12 months

cruising venues' visitors reported inconsistent condom use with regular partners, while a higher proportion reported inconsistent condom use in group sex, unprotected anal sex in the last year with a partner whose HIV serostatus was unknown, and substance consumption before/during the last sexual intercourse.

MSM who visit cruising venues reported more frequently having received free condoms in the previous year and having ever been tested for HIV than other venues' visitors. MSM who visit cruising venues reported less frequently not knowing their serostatus for HIV compared to social gay venues' visitors.

Overall, 14.6 % (95 % CI 11–18 %) of cruising venues' visitors reported to be HIV positive, while a significantly lower proportion of visitors of other venues reported seropositivity [5.5 % (95 % CI 4–7 %)].

The logistic regression analysis (Table 2) showed that MSM who usually visit cruising venues to meet sexual partners were significantly more likely to be older (≥45 years old) (OR 3.01, 95 % CI 1.56–5.84), to have increasing number of sexual partners (OR 1.02, 95 % CI 1.01–1.04), to engage in group sex (OR 2.22, 95 % CI 1.47–3.34) and in unprotected sex with a partner whose HIV serostatus was unknown (OR 1.67, 95 % CI 1.09–2.55), and to be HIV positive (OR 2.31, 95 % CI 1.07–4.98). Cruising venues' visitors were also less likely to have higher education (OR 0.37, 95 % CI 0.23–0.59).

Results of the association of unprotected anal sex with type of venues visited, behavioral factors, HIV infection, and coverage in HIV prevention campaigns are shown in Table 3. The multivariate analysis showed that engagement in unprotected anal sex in

Table 2 Factors associated with visiting cruising venues to meet sexual partners

	n (%)	*p* value	Crude OR (95 % CI)	Adjusted OR (95 % CI)[a]
Age				
18–24	62 (25.1)	<0.001	1	1
25–34	151 (34.6)		1.57 (1.11–2.23)*	1.40 (0.88–2.23)
35–44	94 (45.6)		2.50 (1.68–3.73)***	1.79 (1.02–3.15)*
≥45	59 (49.2)		2.89 (1.82–4.57)***	3.01 (1.56–5.84)**
Educational level				
Elementary	99 (47.1)	0.001	1	1
Secondary	136 (34.5)		0.59 (0.42–0.83)**	0.64 (0.40–1.02)[†]
Higher	125 (31.6)		0.52 (0.37–0.73)***	0.37 (0.23–0.59)***
	M (SD)	*p* value	Crude OR (95 % CI)	Adjusted OR (95 % CI)[a]
Number of male sexual partners in the last 12M	28.4 (54.8)	<0.001	1.04 (1.03–1.05)***	1.02 (1.01–1.04)***
	n (%)	*p* value	Crude OR (95 % CI)	Adjusted OR (95 % CI)[a]
Group sex in the last 12M				
No	208 (28.9)	<0.001	1	1
Yes	146 (57.7)		3.36 (2.50–4.52)***	2.22 (1.47–3.34)***
Unprotected anal sex in the last 12 M with a partner whose HIV serostatus was unknown				
No	177 (32.4)	<0.001	1	1
Yes	89 (52.4)		2.30 (1.62–3.26)***	1.67 (1.09–2.55)*
Reported HIV status				
HIV negative	258 (35.3)	<0.001	1	1
HIV positive	53 (60.2)		2.78 (1.77–4.37)***	2.31 (1.07–4.98)*
Don't know	52 (28.1)		0.72 (0.50–1.02)	0.67 (0.41–1.10)
Hosmer–Lemeshow goodness-of-fit, χ^2 (df), *p* value				5.2 (8), 0.732

OR odds ratio, *CI* confidence interval, *SD* standard deviation, *12M* 12 months

[†] $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

[a] Adjusted for age, educational level, number of male sexual partners in the last 12 months, group sex in the last 12 months, unprotected anal sex in the last 12 months with a partner whose HIV serostatus was unknown, and reported HIV status

Table 3 Type of venues visited, behavioral factors, HIV infection, and coverage in HIV prevention campaigns associated with unprotected anal sex in the last 12M with a partner whose HIV serostatus was unknown

	n (%)	*p* value	Crude OR (CI 95 %)	Adjusted OR (CI 95 %)[a]
Venues usually visited to meet sexual partners				
Social gay venues	81 (18.0)	<0.001	1	1
Cruising venues	89 (33.5)		2.30 (1.62–3.26)***	1.76 (1.17–2.66)**
	M (SD)	*p* value	Crude OR (CI 95 %)	Adjusted OR (CI 95 %)[a]
Number of male sexual partners in the last 12M	25.4 (44.9)	<0.001	1.01 (1.01–1.02)***	1.01 (1.00–1.01)*
	n (%)	*p* value	Crude OR (CI 95 %)	Adjusted OR (CI 95 %)[a]
Group sex in the last 12M				
No	98 (19.5)	<0.001	1	1
Yes	65 (34.4)		2.17 (1.49–3.14)***	1.60 (1.03–2.47)*
Substance consumption before/during the last sexual intercourse				
No	98 (21.1)	0.009	1	1
Yes	72 (30.0)		1.54 (1.08–2.19)*	1.64 (1.11–2.43)*
Reported HIV status				
HIV negative	105 (20.3)	0.001	1	1
HIV positive	22 (39.3)		2.54 (1.43–4.52)**	1.88 (0.96–3.70)[†]
Don't know	42 (30.7)		1.73 (1.14–2.65)*	2.14 (1.32–3.45)**
Reached by HIV prevention programs in the last 12M				
Yes	53 (17.5)	0.001	1	1
No	114 (28.5)		1.88 (1.30–2.71)**	1.69 (1.14–2.52)**
Hosmer–Lemeshow goodness-of-fit, χ^2 (df), *p* value				8.6 (8), 0.380

OR odds ratio, *CI* confidence interval, *SD* standard deviation, *12M* 12 months

[†] $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

[a] Adjusted for venues usually visited to meet sexual partners, number of male sexual partners in the last 12 months, group sex in the last 12 months, substance consumption before/during the last sexual intercourse, reported HIV status and reached by HIV prevention programs in the last 12 months

the last 12 months with a partner whose HIV serostatus was unknown was more likely among cruising venues' visitors (OR 1.76, 95 % CI 1.17–2.66), MSM who reported higher number of male sexual partners (OR 1.01, 95 % CI 1.00–1.01), those who engaged in group sex (OR 1.60, 95 % CI 1.03–2.47), those who consumed substances before/during the last sexual intercourse (OR 1.64, 95 % CI 1.11–2.43), those reporting not knowing their HIV serostatus compared to those HIV negative (OR 2.14, 95 % CI 1.32–3.45), and those not reached with HIV prevention campaigns in the last 12 months (OR 1.69, 95 % CI 1.14–2.52).

Discussion

This study provided insight into characteristics of MSM who visit different types of venues to meet sexual partners and examined differences in HIV prevalence and risk behaviors, being one of the few studies in Europe.

More than a third of respondents reported frequently visiting cruising venues to meet sexual partners. A significantly higher proportion of cruising venues' visitors (14.6 %) reported to be HIV positive, when compared to those who visit social gay venues (5.5 %). Our reported prevalence data are in line with other European studies with MSM where similar range of prevalence estimates were found (1.3–19.7 % in EMIS survey, 2.6–17.0 % in SIALON I project) (Marcus, Hickson, Weatherburn, & Schmidt, 2012; Mirandola et al., 2009), despite data being collected in different contexts and with different methodologies. In our study, as in others, older MSM tend to seek sexual contact at cruising venues, while younger MSM more frequently use the internet and gay bars (Vanden Berghe et al., 2011). As HIV infection is more prevalent in older age groups, it was expected to find higher HIV infection within those settings. Other potential explanation for a higher proportion of HIV-positive MSM visiting cruising venues relates

to the possibility of non-disclosure to partners in such places, where there is a decreased expectation for verbal or direct communication because of the casual or anonymous nature of the sexual encounters (Bird & Voisin, 2011; Wei, Lim, Guadamuz, & Koe, 2012). In more anonymous settings, disclosure may be also mitigated by perceived serostatus based on circumstantial evidence and normative assumptions based on the setting of the encounter (Parsons et al., 2006; Rönn, White, Hughes, & Ward, 2014).

Our findings indicate that MSM who frequently visit cruising venues to meet sexual partners also engage more frequently in high-risk sexual behaviors as having higher number of male sexual partners, engaging in group sex, and having unprotected sex with a partner whose HIV serostatus was unknown, similarly to other studies (Aynalem et al., 2006; Binson et al., 2001; Parsons & Halkitis, 2002). Also, factors as higher number of male sexual partners, engagement in group sex, and substances consumption before/during the last sexual intercourse were associated with unprotected anal intercourse, consistently with other research (Mimiaga et al., 2011; Reidy et al., 2009; Tang et al., 2013). It has been put forward that the environment of cruising venues potentially fosters the engagement in sex acts with multiple anonymous partners (Aynalem et al., 2006). Indeed, some authors suggest that in these venues, men tend to engage in unprotected sex while detached from any sense of connection to their sexual partners, as a means for coping with needs for sexual sensation seeking or sexual adventurism (Aynalem et al., 2006; Parsons & Halkitis, 2002). This potentially reduces the feeling of responsibility of protecting himself and casual sexual partners from HIV transmission (Aynalem et al., 2006; O'Leary, Horvath, & Rosser, 2013; Parsons & Halkitis, 2002). In line with this, other research has underscored the role of risk seeking as a predictor of HIV acquirement/transmission (Conner, Stein, & Longshore, 2005; Parsons & Halkitis, 2002). High-risk seekers are likely to be more impulsive, disinhibited, and to engage more frequently in high-risk sexual behaviors, leading them to be at increased risk for HIV infection (Conner et al., 2005).

An important finding is that a considerable proportion of MSM reported not knowing their HIV serostatus and these MSM were more likely to engage in unprotected anal intercourse with a partner whose HIV serostatus was unknown. These findings are particularly striking, given that a substantial number of MSM in our study reported having never been tested for HIV. Moreover, MSM not reached with HIV prevention were more likely to engage in unprotected anal intercourse. Our results highlight that these particular subgroups of high-risk-taking MSM who are unaware of their HIV serostatus and who remain out of scope of current prevention actions are in great need of HIV prevention efforts. These findings are also of particular interest as they reinforce that sexual health education and HIV prevention initiatives within venues may be effective and should be supported (Binson et al., 2001).

The limitations of this study must be acknowledged. As the study sample was not randomly recruited, the results may not reflect the situation of MSM in general. As a matter of fact, the lack of research with key populations so far has been due greatly to difficulties in reaching these groups for population-based health research (Magnani, Sabin, Saidel, & Heckathorn, 2005). Secondly, as data are self-reported, response bias and social stigma may have inhibited some participants to disclose their HIV serostatus and risk behaviors. Nevertheless, the high response rate and the obtained data on reported HIV prevalence make us confident of the responses' validity. In a worst-case scenario, our data underestimate the HIV prevalence and risks for infection among MSM. But we have no reasons to believe that such underestimation should be uneven in different groups of venues' visitors. Finally, although the demographic profile of individuals who refused to participate in the study was similar to those who participated, we did not collect information about reasons for refusal nor about reported HIV infection, so it is not possible to determine to what extent HIV prevalence and related risk behaviors might have differed between participants and refusals.

Our results provide evidence of the relationship between environments where MSM meet other MSM for sex and risk behavior. The findings show that cruising venues are a context that fosters engagement in unprotected sex, playing an important role in increasing risk of HIV transmission among MSM. Venue-focused behavioral interventions as promotion of condom use and HIV testing are needed. This may contribute to enhance safer sex practices, to decrease unawareness of HIV infection, and consequently to reduce transmission. Strategies focused on people living with HIV should also be supported. Cruising venues should be considered as an optimal setting to reach high-risk MSM for HIV research and targeted prevention interventions.

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Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional

and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in this study.

References

Alkaiyat, A., Schaetti, C., Liswi, M., & Weiss, M. G. (2014). Condom use and HIV testing among men who have sex with men in Jordan. *Journal of the International AIDS Society, 17*, 18573.

Aynalem, G., Smith, L., Bemis, C., Taylor, M., Hawkins, K., & Kerndt, P. (2006). Commercial sex venues: A closer look at their impact on the syphilis and HIV epidemics among men who have sex with men. *Sexually Transmitted Infections, 82*, 439–443.

Beyrer, C., Baral, S. D., van Griensven, F., Goodreau, S. M., Chariyalertsak, S., Wirtz, A. L., & Brookmeyer, R. (2012). Global epidemiology of HIV infection in men who have sex with men. *Lancet, 380*, 367–377.

Binson, D., Woods, W. J., Pollack, L., Paul, J., Stall, R., & Catania, J. A. (2001). Differential HIV risk in bathhouses and public cruising areas. *American Journal of Public Health, 91*, 1482–1486.

Bird, J. D. P., & Voisin, D. R. (2011). A conceptual model of HIV disclosure in casual sexual encounters among men who have sex with men. *Journal of Health Psychology, 16*, 365–373.

Conner, B. T., Stein, J. A., & Longshore, D. (2005). Are cognitive AIDS risk-reduction models equally applicable among high- and low-risk seekers? *Personality and Individual Differences, 38*, 379–393.

Dias, S., & Gama, A. (2014). Community-based participatory research in public health: Potentials and challenges. *Revista Panamericana de Salud Pública, 35*, 150–154.

Grov, C., Golub, S. A., & Parsons, J. T. (2010). HIV status differences in venues where highly sexually active gay and bisexual men meet sex partners: Results from a pilot study. *AIDS Education and Prevention, 22*, 496–508.

Grov, C., Hirshfield, S., Remien, R. H., Humberstone, M., & Chiasson, M. A. (2013). Exploring the venue's role in risky sexual behavior among gay and bisexual men: An event-level analysis from a national online survey in the U.S. *Archives of Sexual Behavior, 42*, 291–302.

Le Vu, S., Velter, A., Meyer, L., Peytavin, G., Guinard, J., Pillonel, J., … Semaille, C. (2012). Biomarker-based HIV incidence in a community sample of men who have sex with men in Paris, France. *PloS One, 7*, e39872.

Magnani, R., Sabin, K., Saidel, T., & Heckathorn, D. (2005). Review of sampling hard-to-reach and hidden populations for HIV surveillance. *AIDS, 19*, S67–S72.

Marcus, U., Hickson, F., Weatherburn, P., & Schmidt, A. J. (2012). Prevalence of HIV among MSM in Europe: Comparison of self-reported diagnoses from a large scale internet survey and existing national estimates. *BMC Public Health, 12*, 978.

Melendez-Torres, G. J., Nye, E., & Bonell, C. (2015). Is location of sex associated with sexual risk behaviour in men who have sex with men? Systematic review of within-subjects studies. *AIDS and Behavior*. doi:10.1007/s10461-015-1093-z.

Mimiaga, M. J., Reisner, S. L., Bland, S. E., Driscoll, M. A., Cranston, K., Isenberg, D., … Mayer, K. H. (2011). Sex parties among urban MSM: An emerging culture and HIV risk environment. *AIDS and Behavior, 15*, 305–318.

Mirandola, M., Folch Toda, C., Krampac, I., Nita, I., Stanekova, D., Stehlikova, D., … Bonavina, M. G. (2009). HIV bio-behavioural survey among men who have sex with men in Barcelona, Bratislava, Bucharest, Ljubljana, Prague and Verona, 2008–2009. *Euro Surveillance, 14*, 19427.

Muhib, F. B., Lin, L. S., Stueve, A., Miller, R. L., Ford, W. L., Johnson, W. D., & Smith, P. J. (2001). A venue-based method for sampling hard-to-reach populations. *Public Health Reports, 116*, 216–222.

O'Leary, A., Horvath, K. J., & Rosser, B. R. S. (2013). Associations between partner-venue specific personal responsibility beliefs and transmission risk behavior by HIV-positive men who have sex with men (MSM). *AIDS and Behavior, 17*, 1855–1861.

Parsons, J. T., & Halkitis, P. N. (2002). Sexual and drug-using practices of HIV-positive men who frequent public and commercial sex environments. *AIDS Care, 14*, 815–826.

Parsons, J. T., Severino, J., Nanin, J., Punzalan, J. C., von Sternberg, K., Missildine, W., & Frost, D. (2006). Positive, negative, unknown: Assumptions of HIV status among HIV-positive men who have sex with men. *AIDS Education and Prevention, 18*, 139–149.

Reidy, W. J., Spielberg, F., Wood, R., Binson, D., Woods, W. J., & Goldbaum, G. M. (2009). HIV risk associated with gay bathhouses and sex clubs: Findings from 2 Seattle surveys of factors related to HIV and sexually transmitted infections. *American Journal of Public Health, 99*, S165–S172.

Reisen, C. A., Iracheta, M. A., Zea, M. C., Bianchi, F. T., & Poppen, P. J. (2010). Sex in public and private settings among Latino MSM. *AIDS Care, 22*, 697–704.

Reisner, S. L., Mimiaga, M. J., Skeer, M., Vanderwarker, R., Gaucher, M. J., O'Connor, C. A., … Safren, S. A. (2009). Differential HIV risk behavior among men who have sex with men seeking health-related mobile van services at diverse gay-specific venues. *AIDS and Behavior, 13*, 822–831.

Rönn, M., White, P. J., Hughes, G., & Ward, H. (2014). Developing a conceptual framework of seroadaptive behaviors in HIV-diagnosed men who have sex with men. *Journal of Infectious Diseases, 210*, S586–S593.

Tang, W., Huan, X., Mahapatra, T., Tang, S., Li, J., Yan, H., … Detels, R. (2013). Factors associated with unprotected anal intercourse among men who have sex with men: Results from a respondent driven sampling survey in Nanjing, China, 2008. *AIDS and Behavior*, *17*, 1415–1422.

UNAIDS. (2012). *Global Report—UNAIDS Report on the global AIDS epidemic 2012*. Geneva: Author.

Vanden Berghe, W., Nostlinger, C., Buvé, A., Beelaert, G., Fransen, K., & Laga, M. (2011). A venue-based HIV prevalence and behavioural study among men who have sex with men in Antwerp and Ghent, Flanders, Belgium, October 2009 to March 2010. *Euro Surveillance, 16*, 19914.

Wallerstein, N., & Duran, B. (2006). Using community-based participatory research to address health disparities. *Health Promotion Practice, 7*, 312–323.

Wei, C., Lim, S. H., Guadamuz, T. E., & Koe, S. (2012). HIV disclosure and sexual transmission behaviors among an Internet sample of HIV-positive men who have sex with men in Asia: Implications for prevention with positives. *AIDS and Behavior, 16*, 1970–1978.

WHO. (2014). *Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations*. Geneva: Author.

Zhao, J., Chen, L., Cai, W.-D., Tan, J.-G., Tan, W., Zheng, C.-L., … Wang, X.-R. (2013). HIV infection and sexual behaviors among non-commercial men who have sex with men at different venues. *Archives of Sexual Behavior*, *43*, 801–809.