Demographic and Behavioral Correlates of HIV Risk among Men and Transgender Women Recruited from Gay Entertainment Venues and Community-based Organizations in Thailand: Implications for HIV Prevention

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Abstract High HIV prevalence among men who have sex with men (MSM) and transgender women in Thailand suggest a vital need for targeted interventions. We conducted a cross-sectional survey to examine and compare sexual risk behaviors, and demographic and behavioral correlates of risk, among MSM and transgender women recruited from gay entertainment venue staff and community-based organization (CBO) participants. We used venue-based sampling across nine sites in Bangkok and Chiang Mai. Among 260 participants (57.3% gay-identified, 26.9% heterosexual/bisexual-identified, 15.8% transgender; mean age=26.7 years), nearly one-fifth (18.5%) reported unprotected anal sex (UAS), half (50.4%) sex in exchange for money, and one-fifth (20.0%) STI diagnosis (past year). Nearly one-fourth (23.1%) reported oral erectile dysfunction medication use and nearly one-fifth (19.2%) illicit drug use (past 3 months). Overall, 43.1% indicated that healthcare providers exhibited hostility towards them. Gay entertainment venue staff were significantly more likely to self-identify as heterosexual/bisexual (versus gay or transgender female), and to have less than high school degree education, higher monthly income, to have engaged in sex in exchange for money, sex with women and unprotected vaginal sex, but were significantly less likely to have engaged in UAS than CBO participants. Targeted interventions for younger MSM and transgender women, for non gay-identified men, and strategies to address structural determinants of risk, including low education and discrimination from healthcare providers, may support HIV prevention among MSM and transgender women, and serve broader national HIV prevention efforts in Thailand.

Keywords Men who have sex with men · Transgender women · HIV · Sexual risk behaviors · Thailand

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Introduction

Southeast Asia, with 1.6 million HIV infections, is guardedly approached as the next frontier for the global epidemic (UNAIDS 2008), including a burgeoning epidemic among men who have sex with men (MSM) (Baral et al. 2007; Centers for Disease Control and Prevention 2006; van Griensven et al. 2005). In Thailand, although the epidemic first appeared among MSM, HIV prevention and treatment strategies have focused on heterosexual risk and, to a lesser extent, injecting drug users (UNAIDS 2007).

MSM were historically not included in Thailand's national HIV surveillance system (Thailand Ministry of Public Health 2003). The rationale for low expenditures on interventions aimed at MSM, in turn, is largely driven by existing data on HIV prevalence and risk behaviors, creating a familiar vicious cycle: "No data equals no problem; no problem equals no intervention; and no intervention equals no need to collect data" (Monitoring the AIDS Pandemic

Report 2005). Consequently, while MSM are estimated to contribute over 20% of all new infections in Thailand, MSM-specific spending represents just over 1% of the total Thai HIV/AIDS budget (UNAIDS 2007).

National HIV seroprevalence in Thailand is estimated at 1.4%, with 21,000 new infections in 2003 (AVERT 2009); yet HIV prevalence among MSM in Bangkok increased by over 50% from 17.3% in 2003 (van Griensven et al. 2005) to 28.3% in 2005 (Centers for Disease Control and Prevention 2006), and to 30.8% in 2007 (van Griensven et al. 2010). Among transgender women, HIV prevalence was 13.5% in 2005 (Centers for Disease Control and Prevention 2006). In 2007, the Thai Ministry of Public Health estimated HIV prevalence among MSM at over 30.0% in Bangkok and 16.9% in Chiang Mai (Pliplat et al. 2008).

Although Thailand's early governmental response to the HIV epidemic is often espoused as a successful model of HIV/AIDS control, recent seroprevalence trends among MSM and transgender women suggest vital gaps in prevention. Nevertheless, homogeneous preventive interventions geared for MSM in Thailand may overlook important within-population differences (Chemnasiri et al. 2010). MSM, a broad epidemiological term, includes men who self-identify as gay, bisexual and heterosexual; men who have sex with only men or with both men and women; and some men who engage in sex with men for money. Transgender women include biological males at various points along a spectrum of female gender identification, dressing as women, taking hormones, and planning or having engaged in gender reassignment surgery (Jenkins et al. 2005). In particular, men and transgender women who work in the gay entertainment industry, including bars, nightclubs and commercial sex venues catering largely to men, may have diverse sexual and gender identifications, some of whom also have sex with women and some who engage in sex for money.

In order to build empirical evidence to support tailored prevention efforts, we examined demographic and HIV risk factors among diverse men and transgender women, key populations at elevated risk of HIV exposure in Thailand. We also hypothesized that HIV risks may differ between participants from different venues; therefore, we recruited MSM and transgender women from gay entertainment venues and from community-based organizations (CBOs) providing services to gay and other MSM, male sex workers and transgender women.

Methods

Participants and Setting

Men and transgender women were recruited using purposive, venue-based sampling (Frankel et al. 1999) in Bangkok and Chiang Mai, cities with concentrated HIV epidemics. First we identified an array of gay entertainment venues, including gay bars, strip clubs, massage parlors, movie theaters and hourly motels. We also identified CBOs that provide services to gay and other MSM, male sex workers and transgender women, with the goals of promoting sexual health and quality of life through a range of educational, social and cultural activities. Second, we explained the research study to establishment owners/managers and solicited site approval. Nine of 13 sites approached granted approval. Third, we arranged convenient times with site managers when eligible populations would be accessible and, in the case of commercial venues, when data collection among staff would not present obstacles to business. To that end, all entertainment venue interviews were conducted between 6 pm and 8:30 pm on site or in a private room nearby. At the designated times, trained community research staff invited volunteers on site to participate in a one-time, confidential structured interview. Interviewers were trained to ensure participation was voluntary and to protect participant confidentiality.

Eligible participants were male or transgender female, 18 years of age or older, on site at the selected venue and able to provide informed consent. We did not screen participants based on self-identified sexual orientation, gender expression or sexual behavior given our objective to assess potential heterogeneity in HIV risk behaviors among venue-based samples.

We developed a structured questionnaire to assess demographics, HIV risk history, sexual behaviors, drug use and perceived discrimination from medical providers. The questionnaire, based on our formative qualitative research (Newman et al. 2010), was designed in English, translated into Thai, back translated into English and revised in Thai. The Thai-language questionnaire was programmed on laptop computers using Computer Assisted Personal Interviewing (CAPI) and administered by community research interviewers. We administered five pilot interviews to ensure comprehensibility and debug the program, and made revisions as necessary. Items on sexual risk behavior were self-administered using a paper-and-pencil form in order to mitigate the tendency for socially desirable responses in face-to-face administration of questions on sensitive behaviors (Phillips et al. 2010). The study was approved by the Research Ethics Board of the University of Toronto. All participants provided written informed consent and were given an honorarium of 300 Thai Baht (~$10 U.S.).

Measures

The main outcomes of interest were "*unprotected anal sex*" *(UAS)* and "*engaged in sex for money*," both in the past 3 months and assessed with self-reported dichotomous

responses (yes = 1; no = 0). We considered sex in exchange for money as an outcome given its pervasive association with HIV infection and with various social and structural risk factors (e.g., low education, discrimination) among MSM, some of which differentially impact on gay-identified men, other MSM who may not self-identify as gay or bisexual, and transgender women (e.g., Jenkins et al. 2005; Newman et al. 2004, 2008; Rietmeijer et al. 1998; Wheeler et al. 2008).

Demographic characteristics included age, sexual orientation, gender identification, education, employment status and monthly income. We dichotomized age at 25 years based on UNAIDS (2010) reporting of HIV among youth, who are at disproportionately high risk for HIV infection globally compared to adults. We assessed educational attainment and socioeconomic status, which have been identified as correlates of HIV risk in several low- and middle-income countries (LMIC) (e.g., Gillespie et al. 2007; Hargreaves and Glynn 2002).

Potential behavioral correlates and predictors included the following: *Sexually Transmitted Infection (STI)* diagnosed by a physician in the past year was self-reported by participants and assessed as a dichotomous measure (yes = 1; no = 0). STIs increase risk for HIV transmission and serve as markers for unprotected sex (Fleming and Wasserheit 1999; Sangani et al. 2007). *Gay bathhouse attendance* was assessed with one dichotomous item (yes = 1; no = 0); these venues have been associated with increased HIV infection risk among some MSM (Reidy et al. 2009). *Multiple sex partners* was assessed based on the number of sexual partners reported in the past 3 months. We constructed a dichotomous measure with a value of 1 if the participant reported having more than four sexual partners and a value of 0 otherwise; a landmark longitudinal study among MSM in the U.S. (Koblin et al. 2006) (*n*=4295) identified four partners as a meaningful cut-off, associated with significantly higher odds of HIV infection.

Drug use was assessed with two dichotomous items (yes = 1; no = 0), one in response to the use of oral erectile dysfunction medications and one regarding other illicit drugs (club drugs [e.g., Ecstasy, ketamine], methamphetamine, sedative/hypnotics and heroin) (both past 3 months). Illicit drug use (Fisher et al. 2010; Koblin et al. 2006) and oral erectile dysfunction medication use, in particular (Fisher et al. 2010), are associated with UAS among MSM.

We assessed *perceived discrimination from healthcare providers* with two items: provider exhibited hostility to you and provider gave you less attention than others (both, yes = 1; no = 0). Perceived discrimination from healthcare providers has a negative impact on seeking care and on health outcomes among gay and other MSM, as identified in our formative research in Thailand (Newman et al. 2010), and investigations in other

LMIC (Newman et al. 2008) and high income country settings (Makadon 2006).

Data Analysis

We performed all analyses using SPSS 17.0 (SPSS Inc. 2008). First, we used descriptive statistics to identify participants' HIV risk history, sexual behaviors, drug use and perceived discrimination from healthcare providers. We used chi-square tests of independence to examine the bivariate associations between each of the demographic and HIV risk factors, and venue-based population (gay entertainment venue staff versus CBO). We then performed logistic regression to examine the associations between the outcome variables, UAS and sex in exchange for money, and demographic and risk correlates by venue. Based on the significance of the variables in bivariate analysis (all *p*<.05), we then performed multiple logistic regression to examine the independent associations between the outcome variables, UAS and engaging in sex in exchange for money, and demographic and risk correlates by venue. We report adjusted odds ratios for the final logistic regression model.

Results

Demographics

Table 1 describes demographic and behavioral characteristics, and provider discrimination, among men and transgender women from CBOs and gay entertainment venues. Among 260 participants, 57.3% self-identified as gay, 26.9% as heterosexual/bisexual and 15.8% as transgender women, with a median age of 26.7 years (Standard Deviation [*SD*]=5.6). Two-thirds (67.3%) received high school education or more and most (70.4%) were employed full-time. Median individual monthly income was 13,367 Thai Baht (equivalent to $430 USD).

HIV Risk History

Overall, one-fifth (20.0%) reported STI diagnosis by a medical provider in the past year. Half (50.4%) engaged in sex in exchange for money, and nearly two-thirds (63.1%) visited gay bathhouses in the past 3 months. Over two-thirds (76.9%) were tested for HIV and among these, 2% reported testing HIV positive.

Sexual Behavior

Over one-third (38.5%) reported having four or more sexual partners in the past 3 months. Nearly one-fifth (18.5%) reported UAS and 10.4% reported unprotected vaginal sex.

Table 1 Demographic and behavioral characteristics, and provider discrimination, among men and transgender women from community-based organizations and gay entertainment venues in Thailand (*n*=260)

	Total		Community-based organizations		Gay entertainment venues		*p*-value[a]
	N 260	% 100	N 92	% 35.4	N 168	% 64.6	
Demographic characteristics							
Age (mean; years)	26.7	SD=5.6	24.8	SD=4.9	27.7	SD=5.7	<0.001
Sexual orientation/gender identity							0.003
Gay	149	57.3	52	56.5	97	57.7	
Heterosexual/bisexual	70	26.9	9	9.8	61	36.3	
Transgender	41	15.8	31	33.7	10	6.0	
Education							<0.001
< High school	85	32.7	9	9.8	76	45.2	
>= High school	175	67.3	83	90.2	92	54.8	
Employed (full-time)							<0.001
No	77	29.6	48	52.2	29	17.3	
Yes	183	70.4	44	47.8	139	82.7	
Monthly income (Thai baht; mean)	13,367		11,413		14,360		0.001
HIV risk history[b]							
STI diagnosis (past year)							0.27
No	208	80	77	83.7	131	78.0	
Yes	52	20	15	16.3	37	22.0	
Exchanged sex for money							<0.001
No	128	49.2	60	65.2	68	40.7	
Yes	131	50.4	32	34.8	99	59.3	
Gay bathhouse attendance							<0.001
No	96	36.9	51	55.4	45	26.8	
Yes	164	63.1	41	44.6	123	73.2	
Ever tested for HIV							0.14
No	60	23.1	26	28.3	34	20.2	
Yes	200	76.9	66	71.7	134	79.8	
Tested HIV+							
No	255	98.1	91	98.9	164	97.6	
Yes	5	1.9	1	1.1	4	2.4	
Sexual behavior[b]							
Number of partners							0.012
<= 4	160	61.5	66	71.7	94	56.0	
> 4	100	38.5	26	28.3	74	44.0	
Unprotected anal sex							0.007
No	212	81.5	48	66.7	145	86.3	
Yes	48	18.5	24	33.3	23	13.7	
Unprotected vaginal sex							<0.01
No	233	89.6	88	95.7	145	86.3	
Yes	27	10.4	4	4.3	23	13.7	
Sex with women							<0.001
No	187	71.9	80	87.0	107	63.7	
Yes	73	28.1	12	13.0	61	36.3	

Table 1 (continued)

	Total		Community-based organizations		Gay entertainment venues		p-value[a]
	N 260	% 100	N 92	% 35.4	N 168	% 64.6	
Drug use[a]							
Used erectile dysfunction medications							<0.001
No	193	76.9	86	93.5	107	67.3	
Yes	58	23.1	6	6.5	52	32.7	
Used illicit drugs							0.01
No	210	80.8	82	89.1	128	76.2	
Yes	50	19.2	10	10.9	40	23.8	
Discrimination from providers							
Exhibited hostility to you							0.37
No	148	56.9	49	53.3	99	58.9	
Yes	112	43.1	43	46.7	69	41.1	
Given less attention than others							0.70
No	179	68.8	62	67.4	117	69.6	
Yes	81	31.2	30	32.6	51	30.4	

[a] From chi-square test

[b] HIV risk history, sexual behavior and drug use variables reported for the past 3 months unless otherwise noted

Overall, 83.0% reported sex with men (mean=11.3 partners, SD=20.8) and 28.1% reported sex with women (mean=2.0 partners, SD=6.5) in the past 3 months; 21.2% reported sex with both men and women.

Drug Use

Nearly one-fourth (23.1%) of participants used oral erectile dysfunction medications; of the nearly one-fifth (19.2%) who used illicit drugs, 50.0% used club drugs, 42.0% sedative/hypnotics and 32.0% methamphetamine.

Perceived Discrimination from Healthcare Providers

Across participants, 43.1% reported that healthcare providers exhibited hostility to them and 31.2% reported being given less attention than other patients.

Differences among Participants by Venue

We found significant differences in demographic and behavioral characteristics across venues (see Table 1). Those who work in gay entertainment venues were significantly more likely to self-identify as heterosexual/bisexual (versus gay or transgender female) (36.3% vs. 9.8%), to have less than high school degree education (45.2% vs. 9.8%), and had higher monthly income (14,360 THB vs. 11,413 THB) than participants from CBOs. Participants from gay entertainment venues were significantly more likely to have exchanged sex for money (59.3% vs.

39.8%) and to have gone to gay bathhouses (73.2% vs. 44.6%) than those from CBOs.

In terms of sexual behaviors, participants from gay entertainment venues were significantly more likely to have had more than four sex partners (44.0% vs. 28.3%), sex with women (36.3% vs. 13.0%) and unprotected vaginal sex (13.7% vs. 4.3%), but were less likely to have engaged in UAS (13.7% vs. 33.3%) (all past 3 months) than those from CBOs. Participants from gay entertainment venues were also significantly more likely to report erectile dysfunction medication use (32.7% vs. 6.5%) and illicit drug use (23.8% vs. 10.9%) than those from CBOs.

Unprotected Anal Sex and Sex in Exchange for Money by Venue

Unprotected Anal Sex Table 2 presents the unadjusted logistic regression models examining correlates of UAS by venue. One-third of CBO participants reported UAS. In unadjusted analysis, being less than 25 years of age was associated with a nearly fourfold increase in the odds of UAS. Gay and transgender female identification were associated with significantly lower odds of UAS versus heterosexual/bisexual identification. Exchanging sex for money and having more than four sex partners (past 3 months) were each associated with 70% lower odds of UAS. In adjusted analysis, age under 25 years (adjusted odds ratio [AOR]=3.22, 95% Confidence Interval [C.I.] 1.02, 10.08), gay (AOR=.06, 95% CI .01, .42) and transgender identification (AOR=.10, 95% CI .01, .71) (versus heterosexual),

Table 2 Bivariate analysis of correlates of unprotected anal sex among MSM and transgender women stratified by venue, Thailand (*n*=260)

	Community-based organization (N=92)				Gay entertainment venue (N=168)			
	N	%	OR	95% CI	N	%	OR	95% CI
Demographic characteristics								
Age <25	45	48.9	3.81**	1.40–10.35	51	30.4	2.40	0.98–5.89
Sexual orientation/gender identity								
Heterosexual/bisexual (Ref)	9	9.8			61	36.3		
Gay	52	56.5	0.06**	0.01–0.33	97	57.7	1.11	0.43–2.84
Transgender	31	33.7	0.11*	0.02–0.67	10	6.0	0.73	0.08–6.61
Education < high school	9	9.8	1.38	0.31–6.02	76	45.2	1.69	0.69–4.11
Employed	44	47.8	0.51	0.20–1.32	139	82.7	0.99	0.31–3.16
Income >12,500 Thai baht	19	20.7	0.66	0.19–2.22	65	38.7	1.54	0.63–3.74
HIV risk history[a]								
STI diagnosis (past year)	15	16.3	0.62	0.16–2.43	37	22.0	1.67	0.63–4.44
Exchanged sex for money	32	34.8	0.26*	0.08–0.85	99	59.3	1.06	0.43–2.62
Gay bathhouse attendance	41	44.6	1.21	0.48–3.04	123	73.2	1.37	0.47–3.94
Tested for HIV	66	71.7	0.47	0.17–1.25	134	79.8	2.97	0.66–13.36
Sexual behavior[a]								
4+ partners	26	28.3	0.26*	0.07–0.96	74	44.0	1.19	0.49–2.88
Unprotected anal sex	25	27.2			23	13.7		
Unprotected vaginal sex	4	4.3	0.35	0.04–2.65	23	13.7	0.37	0.13–1.08
Sex with women	12	16.4	2.14	0.61–7.51	61	83.6	0.73	0.28–1.90
Drug use[a]								
Used erectile dysfunction medications	6	6.5	0.00		52	32.7	0.95	0.36–2.50
Used illicit drugs	10	10.9	0.64	0.12–3.24	40	23.8	1.15	0.42–3.15
Discrimination from providers								
Exhibited hostility to you	43	46.7	0.68	0.27–1.75	69	41.1	1.12	0.46–2.72
Given less attention than others	30	32.6	1.56	0.60–4.07	51	30.4	0.59	0.20–1.71

OR odds ratio; *CI* Confidence Interval.

[a] HIV risk history, sexual behavior and drug use variables reported for the past 3 months unless otherwise noted

*p<0.05; **p<0.01

and exchanging sex for money (AOR=.24, 95% CI .06, .91) were significantly and independently associated with UAS. Among gay entertainment venue participants, 13.7% engaged in UAS; no significant correlates of UAS were identified.

Sex in Exchange for Money Table 3 presents the logistic regression models examining correlates of sex in exchange for money by venue. Among CBO participants, over one-third (34.8%) had sex in exchange for money. In unadjusted analysis, less than high school degree education was associated with a more than fourfold increase in the odds of exchanging sex for money. STI diagnosis was associated with a more than threefold higher odds of sex in exchange, and UAS with 74% lower odds of sex in exchange for money. As expected, having multiple sexual partners (4+ partners) was

associated with more than 30-fold higher odds of sex in exchange for money. In adjusted analysis among CBO participants, UAS (AOR=.18, 95% CI .04, .71) was significantly and independently associated with sex in exchange for money. Among gay entertainment venue participants, over half (59.3%) had sex in exchange for money. In unadjusted analysis, income greater than 12,500 THB was associated with a more than twofold higher odds, and oral erectile dysfunction drug use a more than threefold higher odds, respectively, of sex in exchange for money. As expected, having multiple sexual partners (4+ partners) was associated with more than 12-fold higher odds of sex in exchange for money. In adjusted analysis, age under 25 years (AOR=2.21, 95% CI 1.02, 4.78), income greater than 12,500 THB (AOR=2.69, 95% CI 1.31, 5.53), and oral erectile dysfunction medication use (AOR=3.06, 95% CI 1.41,

Table 3 Bivariate analysis of correlates of sex in exchange for money among MSM and transgender women stratified by venue, Thailand ($n=260$)

	Community-based organization (N=92)				Gay entertainment venue (N=168)			
	N	%	OR	95% CI	N	%	OR	95% CI
Demographic characteristics								
Age <25	45	48.9	0.72	0.30–1.72	51	30.4	1.98	0.98–4.01
Sexual orientation/gender identity								
Heterosexual/bisexual (Ref)	9	9.8			61	36.3		
Gay	52	56.5	1.70	0.31–9.07	97	57.7	1.01	0.53–1.94
Transgender	31	33.7	2.52	0.45–14.19	10	6.0	6.68	0.79–56.11
Education < high school	9	9.8	4.38*	1.01–18.90	76	45.2	0.97	0.52–1.81
Employed	44	47.8	0.52	0.12–1.26	139	82.7	1.24	0.55–2.78
Income >12,500 Thai baht	19	20.7	1.95	0.70–5.46	65	38.7	2.46**	1.26–4.79
HIV risk history[a]								
STI diagnosis (past year)	15	16.3	3.52*	1.12–11.03	37	22	1.33	0.62–2.85
Exchanged sex for money	32	34.8			99	59.3		
Gay bathhouse attendance	41	44.6	1.15	0.48–2.73	123	73.2	1.41	0.71–2.81
Tested for HIV	66	71.7	0.80	0.31–2.05	134	79.8	0.64	0.29–1.43
Sexual behavior[a]								
4+ partners	26	28.3	30.8**	8.73–108.58	74	44.0	12.17**	5.40–27.44
Unprotected anal sex	25	27.2	0.26*	0.08–0.85	23	13.7	1.06	0.43–2.62
Unprotected vaginal sex	4	4.3	0.51	0.06–3.85	23	13.7	0.93	0.38–2.30
Sex with women	12	16.4	3.08	0.89–10.65	61	83.6	1.49	0.77–2.86
Drug use[a]								
Used erectile dysfunction medications	6	6.5	3.72		52	32.7	3.27**	1.54–6.91
Used illicit drugs	10	10.9	3.21	0.83–12.43	40	23.8	1.35	0.64–2.83
Discrimination from providers								
Exhibited hostility to you	43	46.7	1.80	0.75–4.28	69	41.1	0.81	0.43–1.51
Given less attention than others	30	32.6	1.13	0.45–2.80	51	30.4	0.95	0.49–1.87

OR odds ratio; CI Confidence Interval.

[a] HIV risk history, sexual behavior and drug use variables reported for the past 3 months unless otherwise noted

*$p<0.05$; **$p<0.01$

6.63) were significantly and independently associated with sex in exchange for money.

Discussion

MSM and transgender women in Thailand are populations at high risk of HIV exposure and in vital need of preventive interventions. This study provides empirical evidence of systematic differences in the demographic and risk profiles of MSM and transgender women recruited from different venues, which may help to guide tailored interventions to increase the effectiveness of HIV prevention.

Overall, we identified high risk for HIV infection, including UAS, multiple sex partners and STIs. That the majority (81.5%) reported consistent condom use for anal sex

suggests a good degree of success among community-based HIV prevention efforts; however, the 20% rate of reported STI diagnoses and an estimated mean of over 45 male partners in the past year, along with the one-fifth reporting illicit drug use suggest significant risks for HIV infection. The over one-fifth of men reporting sex with both men and women, nearly identical to that reported in another Thai study (van Griensven et al. 2005), underscores the potential for HIV transmission to male and female partners (Li et al. 2009).

Notably, we identified different demographic and behavioral risk profiles among participants recruited from gay entertainment venue staff and those recruited from CBOs. Different demographic profiles and different correlates of UAS and sex in exchange for money by venue suggest that universal measures of HIV risk among MSM may overlook subpopulations of MSM and transgender

women at higher risk of HIV exposure. HIV risk reduction interventions in Thailand might benefit from targeting different subpopulations of MSM and transgender women and population-specific risk factors.

Among gay entertainment venue staff, the significantly greater proportion of non-gay identified men, lower rates of high school degree education and higher monthly income, as compared to CBO participants, suggest the importance of structural factors in producing their HIV risk. Among this subpopulation, increasing access to high school education, and promoting educational interventions and employment opportunities may support alternative options for earning a living other than transactional sex. Furthermore, interventions housed in gay-identified organizations, while necessary for gay-identified men, may miss a significant proportion of men, as well as transgender women, at highest risk of HIV exposure in Thailand.

The fact that demographic (i.e., younger age, non-gay sexual orientation) and behavioral correlates (i.e., sex in exchange for money, multiple partners) of UAS among CBO-based participants were not associated with UAS among gay entertainment venue staff may be due to the success of targeted and sustained community-based interventions among the latter population in increasing condom use. Additionally, the government's 100% Condom Program (Rojanapithayakorn and Hanenberg 1996), although targeting female sex work venues, is a largely successful structural intervention that may have influenced gay entertainment venues as well. Although not without its shortcomings as a top-down approach, by mandating condom use across all sex work establishments, the program assured managers/owners that they would not lose business to other establishments that did not require condom use. No HIV preventive interventions to date even approaching this national scale have addressed gay and other MSM, particularly those not engaged in the gay entertainment industry or the sex trade.

Among CBO participants, the fact that one-third reported sex in exchange for money indicates this risk behavior, while not as ubiquitous as among those working in the gay entertainment industry, is nevertheless important. However, those CBO participants who engaged in sex for money had 74 % lower odds of engaging in UAS. Sex in exchange for money does not necessarily lead to higher risk for HIV infection, given higher rates of condom use. A recent study among young MSM (n=827) in Thailand similarly found higher rates of condom use among "male sex workers" versus "regular MSM" (Chemnasiri et al. 2010). These results suggest a degree of success among CBOs in Thailand aimed at reducing the harms associated with male sex work; however, they also indicate the importance of tailoring risk reduction interventions

for MSM who may engage in only occasional sex for money and may not identify as sex workers.

Across both populations, age less than 25 years was associated with higher HIV risk outcomes. Among CBO participants, age less than 25 was associated with more than threefold higher odds of UAS, controlling for other variables in the model. Among gay entertainment venue participants, those with age less than 25 years had twofold higher odds of engaging in sex for money, controlling for other variables in the model; there was also a non-significant trend towards increased UAS. Interventions supporting consistent condom use should be tailored for young MSM and transgender women in both CBOs and gay entertainment venues.

Oral erectile dysfunction medication use and illicit drug use were significantly higher among participants recruited from gay entertainment venue staff versus CBOs. Among gay entertainment venue staff, oral erectile dysfunction medication use was associated with threefold higher odds of exchanging sex for money, but was not associated with UAS. Oral erectile dysfunction medication use may be an occupational tool for gay entertainment venue staff by enabling insertive anal sex with more partners, an association identified among MSM in other locales (Fisher et al. 2010); but unlike recreational use of oral erectile dysfunction medications reported among MSM in San Francisco (Mansergh et al. 2006; Wong et al. 2005) and Sydney (Prestage et al. 2009), its occupational use appears not to be associated with UAS. Nevertheless, the more than twofold higher rate of illicit drug use reported among gay entertainment venue staff versus CBO participants suggests increased risk for HIV, including impaired ability to enforce condom use with paying clients, and the need for interventions to reduce drug-associated harms among this population (Mayer et al. 2006; Newman et al. 2004).

Participants across venues reported high rates of discrimination from healthcare providers, with nearly half perceiving hostility and one-third being given less attention than other patients. Given that nearly one-quarter of participants had never been tested for HIV, and one-fifth reported an STI diagnosis in the past year, interventions in the healthcare system to reduce discrimination from providers may facilitate HIV prevention. Discrimination and perceived stigma in healthcare may pose obstacles to HIV and STI diagnosis and treatment (Mahajan et al. 2008). Staff from several CBOs engaged in this study reported the need for greater resources to support programs in which they provide peer advocates to accompany MSM, male sex workers and transgender women to public clinics and hospitals for HIV and STI testing and treatment, without which many would not attend on their own due to experiences of discrimination in the healthcare system (Newman et al. 2010).

As with other studies, certain limitations have to be addressed. First, we used venue-based sampling; thus the

findings may not be generalizable to other MSM and transgender women in Thailand, particularly those who do not attend CBOs, and male and transgender female sex workers who may be street-based rather than venue-based. Nevertheless, we successfully recruited participants with diverse sexual and gender identifications from nine venues across two cities. Second, the cross-sectional nature of the study precludes our ability to assess causality; and we cannot rule out the possibility that some participants may frequent both types of venues. Third, although risk correlates were assessed by self-report, we specified STIs diagnosed by a medical provider, and that item in addition to sexual risk behaviors were assessed in an anonymous self-administered questionnaire to reduce the tendency to provide socially desirable responses. Finally, we were able to include transgender women but the relatively small proportion of the sample limits power to detect differences between transgender women and MSM; future HIV surveillance and behavioral studies in Thailand should make concerted efforts to include transgender women as well as non-gay-identified men.

This study provides empirical evidence of distinct demographic and HIV risk factors among MSM and transgender women in Thailand. Given high HIV prevalence among these populations (Pliplat et al. 2008), and opportunities in the emergence of new biomedical prevention technologies such as pre-exposure prophylaxis (PrEP) (Grant et al. 2010), the present investigation underscores the need for tailored prevention initiatives: targeted interventions for young MSM and transgender women, and for non-gay-identified men; and strategies to address structural determinants of risk, including low education and discrimination from healthcare providers. Multi-level interventions tailored for specific subpopulations of MSM and transgender women may help to address tremendous disparities in HIV infection rates among these populations, as well as supporting broader national HIV prevention efforts in Thailand.

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