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Sex Work Venue and Condom Use among Female Sex Workers in Senggigi, Indonesia

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Abstract

This paper examines the structural influence of sex work venues on condom use among female sex workers in the Senggigi area of Lombok, Indonesia. A cross-sectional design employing ethnographic observation, structured interviews and hierarchical linear modeling was used to examine condom use among female sex workers who solicited clients at three types of sex work venues: freelance, brothels, and entertainment places (karaoke bars and massage parlours). The sample consisted of 115 women “nested” within 16 sex work venues drawn from the three venue types. Rate (39%) of condom use varied across sex work venues. Perceived management style, HIV/AIDS-related policies, and risk-reduction services differed by venue, but this variation did not explain differences in condom use. At the individual level, higher condom use was associated with female sex workers having ever been married. At the client level, condoms were more likely to be used with foreign rather than domestic/local Indonesian clients. Low rates of condom use among Indonesian female sex workers during commercial sex suggests the need for increased HIV prevention efforts that acknowledge sex worker characteristics and relationships with clients that place them at risk. Future research into the effects of social context on HIV risk should also be considered.

Keywords

Sex work; venue; condom use; HIV; Indonesia

Introduction

Compelling evidence shows consistent condom use to be associated with lower HIV infection rates among female sex workers worldwide (Bautista et al. 2006; Foss et al. 2007; Kimani et al. 2008; Yadav et al. 2005). In Indonesia, which is the world’s most populous Muslim country, commercial sex is technically illegal but generally tolerated (Hull, Sulistyaningsih, and Jones 1999). Regulations vary widely, with some cities implementing but seldom enforcing radical laws to prosecute those who engage in or manage the business of prostitution. Government attempts to promote safer sex and increase female sex workers’ level of condom use during commercial sex have had limited success despite extensive prevention efforts (MAP 2005; MOH 2012; Riono and Jazant 2004).

With such failures also occurring globally, awareness has grown of the need to shift efforts from focusing solely on individuals to approaches that attempt to understand and subsequently create social environments that encourage positive behavioural change. Indeed, a growing literature confirms that the environment within which a population at risk engages in sexual activity (e.g., shooting galleries, bathhouses, and residence buildings) influences their HIV risk (Binson and Wood 2003; Klein and Levy 2003; Ouellet et al. 1991; Schensul, Levy, and Disch 2003; Tempalski and McQuie 2009). Likewise, the social settings where sex transactions occur appear especially promising as venues for both understanding risky behaviour and for promoting safer sex (Bungay et al. 2011; Choudhury 2010; Handlovsky, Bungay, and Kolar 2012; Mahdavi 2010; Morisky et al. 2010; Murray et al. 2010; Smolak 2010; Yang et al. 2010).

This study examines the structural influence of sex work environments on condom use among female sex workers recruited from three types of sex work venues: discotheques/bars, brothels, and entertainment places (karaoke bars and massage parlors) in Senggigi on Lombok Island in the eastern Indonesian province of West Nusa Tenggara. Senggigi is an excellent location to study the influence of sex work venues as the city hosts a well-established sex industry that constantly attracts foreign and domestic tourists. As with much of Southeast Asia (Brazil 2004; Law 2000; Truong 1990), sex in Senggigi is sold through contact initiated on the street, through bars, within brothels, and as a sideline to other occupations.

Sex work venues as risk environments

Numerous studies (Ford et al. 2000; 2002; Hugo 2001; Joesoef et al. 2000; MOH 2012; Riono and Jazant 2004) indicate that HIV risk behaviour varies by sex work venue. Client demographic characteristics and their place of origin also appear to influence sex workers' condom use within commercial sex environments at the individual level (Aube-Maurice et al. 2012; Basuki et al. 2002; Thorpe et al. 1997). None of these studies, however, investigate possible patterns of condom use by sex worker and client characteristics both across and within venue type. Moreover, most studies of female sex workers treat sex work venue characteristics as merely one among many independent variables. Few studies have examined the contextual influence of venues on other potentially important variables or compared differences in female sex workers' behaviour across different types of venues. One study in the Philippines, for example, utilised multilevel analysis to examine the situational context for HIV risk behaviour practices of sex workers (Morisky et al. 2002, 2005, 2006). This research, however, focused on the contextual influence of sex work venues in general and did not directly address variations in HIV risk behaviour across venue types or at multi-levels of influence. A multilevel approach that allows simultaneous examination of multiple determinants of FSWs' condom use, including variables measured at the individual, the client, and the contextual levels may be more effective in helping target prevention efforts.

We hypothesise that the type of sex work venue (freelance, brothel, or entertainment/leisure establishment) where sex workers meet their clients predicts their use of condoms. Specifically, at the venue level, we expect that management style, as well as policies and services that support safer sex will be associated with greater condom use. At the individual level, we further posit that condom use varies according to the women's personal characteristics, including their knowledge about HIV. At the client level, we anticipate that condom use varies by the type of client with whom the women engage in paid sex. Consistent with findings reported in the literature, we expect sex workers to be more likely to use condoms with new rather than regular patrons.

Methods

Study design and procedures—A cross-sectional, multi-level design employing ethnographic observation and in-depth interviewing was used to identify and recruit female sex workers in Senggigi on Lombok Island in the eastern Indonesian province of West Nusa Tenggara. Ethics approval for the study was obtained from the Institutional Review Board, Office for the Protection of Research Subjects, University of Illinois at Chicago and also the Regional Development Planning Agency, Office of Research, West Nusa Tenggara.

Outreach workers from two local non-governmental agencies helped the senior author gain access to and ethnographically map the range of sex establishments and venues in the Senggigi commercial sex area. Contextual information about the venues was further obtained through ethnographic observations of the sites and informal interviews with women selling sex within them. Twenty-six sex work venues initially were identified and subsequently categorised into one of three venue types: (1) brothels; (2) freelance (discotheques and bars where women unconnected with the establishment solicited customers for paid sex); and (3) entertainment places (massage parlours and karaoke bars) where women were employed for other purposes but sold sex on the side. With the exception of six freelance locations where approval for study recruitment was unnecessary, a manager's or owner's permission was needed to approach and recruit potential participants for the study. All five brothels, eight out of ten massage parlours, and three out of five karaoke bars granted permission for a total sample of 22 venues including the six freelance locations.

To participate in the study, the women had to: (a) be 18 years of age or older, (b) solicit clients at one of the participating brothels, freelance locations, or entertainment places (massage parlors or karaoke bars) in the Senggigi area, and (c) be willing to provide informed consent to participate in the study. No woman was sampled twice or worked at more than one type of sex work venue. In sampling for the study, a woman was considered to engage in sex work if she reported having exchanged sex for money at least once in the last three months. This definition recognises that sex work in Indonesia is practiced both regularly as a main source of income or intermittently within the context of other forms of employment such as spa attendant or nightclub entertainer. Of 151 women from the 22 venues who agreed to eligibility screening for the study, 115 (76%) reported exchanging sex for money in the last 3 months with at least one paying client.

After gaining informed consent, the senior author administered a structured questionnaire that asked the women to describe the characteristics of the venue where they engaged in commercial sex, including their perceptions of its managerial policies and support for HIV risk reduction, if any. The women also were asked about their demographic background, knowledge about HIV, and a series of questions about the demographic characteristics of their three most recent clients (during the last three months) and their sexual and substance use behaviours with them. To protect confidentiality, code numbers were used instead of names or other personal identifiers, and all completed interviews and other data were kept in a secure location to which only the senior author had access.

Measures—The dependent variable for this analysis was a dichotomous measure of FSW condom use. It was obtained by asking the women about each of the last three clients with whom they reported having vaginal sex in the last three months: "Did you use a condom when you had vaginal intercourse with this client?" Independent variables were measured at three levels: sex work venue, personal (characteristics of the FSW), and client.

Venue-level variables: included supportive versus non-supportive management style as reported by the FSWs and defined by whether or not a venue's owner or manager appeared

to emphasise profit over ensuring their health and welfare, including protection against AIDS. Perceived managerial support has been found to be a significant predictor of condom use during commercial sex (Hong et al. 2008). A second venue-level variable assessed each establishment's HIV risk-reduction policies and services, if any, as measured by the sex workers' reports of whether or not the venue provided free condoms, offered one or more HIV educational sessions for the women, and/or gave permission for them to attend HIV education sessions conducted by local non-governmental organisation. The 16 sex work venues were coded for statistical analysis according to whether or not the women perceived being subjected to a negative management style that maximised profits over concern for their well-being (supervised by non-supportive venue manager-owner = 1; no supervision = 0) and also whether or not the venue where they worked offered HIV/AIDS-related policies and services or not (yes = 1 and no = 0).

Personal-level variables: included each sex worker's demographic characteristics and knowledge about HIV transmission. Demographic variables for the women were coded as marital status (ever versus never married), educational achievement (less than or equal to six years of elementary education versus junior high school or higher), place of origin (Lombok versus non-Lombok), and age (less than or equal to 25 years of age versus older). Knowledge about HIV transmission was measured using a summation index based on the total number of correct responses to a series of 14 questions adopted from a previous study of female sex workers in Indonesia (Ford et al. 2000; 2002).

Client-level variables: were collected and coded as: 1) client type (new versus regular), 2) origin of the client (domestic/local Indonesian versus foreign), and 3) client age (less than versus more than 35 years).

Analysis—A Grounded Theory approach (Glaser and Strauss 1967) was used in analysing the study's ethnographic data to inductively identify patterns across and within venues of how the women met their clients, their work hours, and any venue-based rules or regulations to which they had to adhere when engaging in commercial sex. Interview data reporting venue-related variables, the personal characteristics of sex workers, and those of their clients by type of venue also were examined using bivariate statistics, including one-way analysis of variance (ANOVA), chi-square (χ^2) and Fisher's exact test when cell sizes were small (less than 5).

A random intercept three-level Hierarchical Generalized Linear Model (HGLM) (Raudenbush et al. 2004) examined the relationship between sex work venue and sex workers' condom use. Multi-level analysis is appropriate for use with nested data where individuals within a particular group (in this case, women engaging in commercial sex in one type of venue) are posited to be more similar to each other in terms of the outcome variable (condom use) than they are to individuals (sex workers) in a different group (other types of venues). In this study's design, clients are nested within female sex workers, and female sex workers are nested within sex work venue. Thus, sex work venue characteristics at the highest level, as well as sex worker and client level variables (at the second and lowest levels, respectively), are predicted to influence condom use among female sex workers (at the second level). Figure 1 illustrates the set of predictors at each level that potentially influence women's condom use.

Results

Of the 151 women recruited from 16 sex work venues who were initially screened for possible enrollment in the research, 115 (76%) reported exchanging sex for money with at least one paying client in the last three months. Of these 115 women, 39 engaged in brothel-

based sex work, 47 sought clients through free-lance solicitation at discotheques and bars, and 29 worked at entertainment places (karaoke bars and massage parlors) where commercial sex was offered as a possible side-line to the women's other work responsibilities.

Most of the 115 sex workers (92%) reported having had at least three recent clients during the previous three month period, with the remaining 9 sex workers (8%) reporting one to two recent clients. In total, 330 client encounters were available for analysis. Due to four missing values at the client level, the final sample represented 326 clients (Level-1) nested within 115 sex workers (Level-2) and 16 sex work venues (Level-3). Characteristics pertaining to each of these levels are described below.

Sex work Venue Characteristics (Level 3)

Analysis of the study's ethnographic data provides a rich contextual overview at the venue level of how the women typically met their clients, their work hours and compensation, and the typical venue-based rules or regulations to which they were subject when engaging in commercial sex.

Brothels—As is typical throughout Indonesia (Lim 1998), the 5 brothels sampled in this study consisted of single dwellings managed by the buildings' owners. These somewhat home-like structures included a main residence for the brothel owner and his/her family and also one or two additional rooms designated for commercial sex that were accessible through a separate entrance. The buildings also featured additional communal space where sex workers wait for customers or drink alcoholic beverages with them prior to sex.

Women who sell sex in such brothel arrangements usually live in the surrounding area in small rented rooms managed by a different landlord. They typically arrive for business around 7pm and stay until 2-3am. Some come earlier to socialise with one another while waiting for clients. Should clients seek their services during the day, brothel owners contact sex workers who live nearby.

The women usually are paid relatively small amounts of money per sexual act. Brothel owners typically receive brothel room rental fees from the women. No other form of commission is charged although owners may make additional money from the sale of liquor that is consumed on the brothel premises. As non-employees renting commercial sex space, the women report not being subject to explicit rules set by the brothel owners. Once a woman contracts with a particular brothel, however, she cannot easily relocate elsewhere because brothel owners typically collude to discourage this out of mutual self-interest. Thus, brothel owners appear to exercise a kind of informal monopoly or exclusivity over the women who work out of their establishments.

Free-Lance Locations (Discotheques-bars)—Discotheques/bars in Senggigi are in the business of selling evening leisure activities that include drinking, music, and dancing. Open typically from 8 pm to around 2-3am, their busiest nights are Thursday, Friday and Saturday. Anyone, including women with the intention of contracting commercial sex, can enter as customers upon paying a small cover-charge. Sex workers who solicit clients through these establishments are not employed by or have any direct association with the establishment and the latter receive no commission from sex work transactions. Commercial sex contracted through these venues is free-lance, at the discretion of the sex worker, and the actual sexual exchange occurs elsewhere such as at a nearby hotel.

Sex work for freelancers begins in the early evening with the women approaching prospective customers from the many small kiosks that sell cheap snacks, cigarettes, and

alcohol that line the streets along-side the bars and discotheques. As the night progresses, sex workers shift their approach to waiting for potential clients directly at the discotheques-bars' entrance or by paying the cover fee to enter. The women report preferring to contract foreign tourists as clients, but domestic men who look wealthy are also desirable targets. The women usually charge modest amounts per sexual act, and their clients are expected to pay for a hotel room nearby. Clients wishing to spend the night are charged more.

Entertainment places (Karaoke bars and Massage Parlors)—*Karaoke bars* offer a form of entertainment where customers pay to sing along with recorded music and possibly drink and dance. Women employed in karaoke bars are called *Pemandu Lagu* or “Song Guiders.” To be accompanied during singing and drinking by a song guider, a client must pay a small hourly fee. A VIP room also is available for rent. The women receive a fixed monthly salary from the karaoke owners. They also earn an additional fee if selected by a client to accompany him to the VIP room. Song guides also receive a commission for each alcoholic drink that their clients order.

Women employed as song guiders typically work between the hours of 8pm to 3am. Sexual acts are contracted at the discretion of the song guider and usually enacted at a nearby hotel. While they also may occur in a private VIP room, managers vary in permitting this practice. Song guiders who disclosed selling sex were reluctant to discuss their fees with the interviewer, possibly due to fears of managerial disapproval at earning outside income.

The contractual agreements between the women and the bars that employed them varied. One karaoke bar implemented a three-month contract with a renewal possibility, while the others allowed women to work indefinitely as long as they maintained a good performance. A “good performance” was defined as having certain numbers of regular customers, compliance with regular working hours, and adherence to other rules implemented by the managers-owners. All three bars employed a female *mami* to supervise female bar staff and housed the women in dormitories owned by the establishment.

Massage Parlours, by local ordinance, are officially called “spas” to avoid using a term synonymous with prostitution. Most consist of several small rooms or booths where services take place. In addition to massage therapy, these establishments also provide beauty care and a range of sexual services. Prices for services vary by the luxuriousness of the spa. Sexual acts performed at massage parlours typically involve a modest cost. Some owners collaborate with nearby hotels for outside bookings.

Managerial Style by Type of Venue—Quantitative analysis of venue variables (level 3) contained in the interview data provides further insight as to the possible influence of a venue's managerial properties in supporting the women's well-being and in offering access to HIV services. Out of 16 participating sex work venues, nine (56%) were supervised by managers-owners. Out of those nine, only three (33%) offered HIV/AIDS-related policies and services. By contrast, of the seven venues (44%) not supervised by managers-owners, more than half (57%) offered or supported access to HIV/AIDS-related services

Sex Worker Characteristics (Level 2)

At the individual level, the characteristics of the 115 sex workers differed by sex work venue in terms of their place of origin, age, education, marital status, place started sex work and residence (see Table 1). The average age for freelance, brothel and entertainment-based sex workers were respectively 24, 27 and 31 years ($p < 0.0001$). Freelance-based sex workers were more educated ($p < 0.0001$) and more likely to be single ($p < 0.01$) compared to their brothel and entertainment counterparts.

Women working in brothels were most likely to have been born on Lombok (90%) as compared to 62% of freelancers soliciting clients at bars-discothèques and only 7% of entertainment-based FSWs ($p < 0.0001$). While most sex worker masseuses were born on Lombok, most karaoke employees were originally from Java with a number also coming from the islands of Bali, Sumatra, and Sulawesi. Differences in place of origin reflect the preference of karaoke bars to hire non-local women so as to attract wealthier customers by projecting an image of a high-class business.

Most women working freelance or in brothels, but not those working in entertainment venues, reported Senggigi as their first sex work site ($p < 0.0001$). No differences were found in the mean number of years employed in the sex work industry and/or the mean number of years worked in the current venue. Knowledge of HIV transmission differed by venue type. Freelance-based sex workers scored slightly higher in knowledge about HIV transmission and prevention when compared to their brothel- and entertainment-based counterparts ($p < 0.05$).

Clients Characteristics (Level 1)

Table 2 provides characteristics of clients by sex work venue. Results show that overall reported condom use was 39% for commercial sex. Freelancers soliciting clients at discothèques and bars were more likely than their brothel and entertainment counterparts to use condoms ($p < 0.01$), to have younger clients (35 years of age or less; $p < 0.0001$), and to have foreign as opposed to domestic-Indonesian clients ($p < 0.0001$). No differences in client type (new vs. regular) were found across the three venues.

Predictors of Condom Use across and within Levels 1-3

Table 3 presents results from a three-level random intercept HGLM model that uses variables from all three levels to predict sex workers' condom use. Fitting of a random effects null model confirmed that condom use varied by sex work venues ($\chi^2 = 32.27$; $p = 0.006$).

At the *venue level*, we hypothesised that differences in perceived managerial style and HIV-related policies and services that supported or encouraged risk reduction would help to explain variation in condom use. As shown in Table 3, and contrary to expectation, sex workers' perception of support from venue managers or owners in ensuring their health over maximising establishment profits was not associated with increased condom use (OR=0.40, 95% CI 0.09-1.70). Neither was having HIV-related policies that provided support for accessing services (OR=1.46, 95% CI 0.41-5.22).

At the *personal level*, variability of condom use by individual sex workers across sex work venues was statistically significant ($\chi^2 = 182$; $p = 0.000$). Marital status (OR=2.79, 95% CI 1.03-7.60, $p = 0.044$) was associated with higher condom use. The likelihood of condom use for women who had ever been married was two times greater than for those who had never been married. Unexpectedly, sex workers' knowledge of HIV transmission (OR=1.05, 95% CI 0.91-1.21, $p = 0.489$) was not related to increased condom use.

At the *client level*, the likelihood of sex worker's condom use did not differ by whether or not the client was new or regular (OR=1.06, 95% CI 0.63-1.76, $p = 0.827$). Only a client's demographic origin proved significant ($p < 0.05$). Having a domestic/local Indonesian client as opposed to a foreign client was associated with less condom use (OR=0.30, 95% CI 0.11-0.78, $p = 0.014$).

Discussion

Despite initial expectations, type of venue was not related to sex workers' condom use when examined using multi-level modeling. This finding runs contrary to previous research from other countries and studies showing a relationship between condom use and venue type (Morisky et al. 2002, 2005, 2006; Kerrigan et al. 2003). Perhaps such differences disappear statistically when multi-level analysis is used to control for nested effects, a possibility that calls for the increased use of hierarchical models to confirm or rule out this explanation. Also, with so few women reporting that they used condoms, plus a small sample size (16 venues), differences in condom use by venue type may have been too small to detect.

At the individual level (level 2), only sex worker marital status was related to condom use. Women who reported having ever been married were more likely to use condoms than their single counterparts. Other research also has shown similar findings (Yang et al. 2010). Possibly, marriage leads to greater familiarity or acceptance of condom use due to experience with reproductive family planning or possibly it confers greater incentive for actively protecting against HIV and sexually transmitted infections for family reasons.

At the client level, and contrary to our expectations, sexual exchanges with new as opposed to regular clients did not predict condom use. This finding runs contrary to other studies that have found a greater tendency to use condoms with new clients (Day, Ward, and Perrotta 1993; Havanon, Bennett, and Knodel 1993; Morris et al. 1995; Podhisita et al. 1996; Tran et al. 2005, 2006). As noted earlier, however, we did find an association between condom use and the geographic origin of clients. Women were less likely to use a condom with their domestic-local Indonesian clients than with foreigners, a finding supported by results from other Indonesian sex worker studies (Basuki et al. 2002; Wirawan et al. 1993; Wolffers 1999). From a prevention standpoint, such consistent findings suggest that HIV messages directed at sex workers should emphasise that HIV can be contracted through unprotected sex with clients of all backgrounds and types. Also, since men typically control decisions about condom use during commercial sex, interventions that promote requests for condom use by clients appear warranted (Morisky et al. 2010).

Conclusions

Numerous HIV risk reduction programmes ranging from individual, community to structural interventions have been implemented in several geographic areas in Indonesia since the early epidemic in the late 1990s (MAP 2005; Ford et al. 2002; PATH 2001). Nonetheless, recent integrated biological and behavioural surveillance among FSWs in Indonesia found no evidence of increased condom use and Indonesia is now experiencing one of the world's fastest growing epidemics (MOH 2012). In this regard, we failed to find that managerial support for HIV education and encouragement for risk-reduction through the provision of free condoms predicted greater condom use. Such limited efforts appear insufficient in generating positive action. Education alone, for example, seldom evokes sustained behavioural change, and merely making condoms available does not assure their use. The delivery of comprehensive, specially tailored, and scientifically proven risk reduction programming and access to innovative, non-judgemental health care could show different results (Lazarus et al. 2012). The Thai 100% Condom Program offers an example of a multi-level prevention programme uniting FSWs, establishment managers, and local authorities to jointly promote condom use during commercial sex (Rojanapithayakorn and Hanenberg 1996).

Comprehensive programming sponsored by or delivered through venues could have an indirect pay-off for the environments where sex work takes place. Brothel owners make

money from the rooms that the women rent and possibly also receive a cut of the proceeds. Companionship between sex workers and clients prior to transactional sex contributes to alcohol sales at brothels, karaoke bars, and discothèques. Also, an unknown number of men likely patronise massage parlours and other leisure settings with the expectation of contracting commercial sex through the experience. Consequently, a strong argument could be made that it is in the best interest of these venues to adopt comprehensive policies to help protect the health and well-being of the women and the establishments' customers. Easy access to condoms through rest-room dispensers and other means might encourage their use. Massage parlours and karaoke bars could sponsor HIV education sessions after hours or encourage employees to attend those offered locally by non-government AIDS organisations. Furthermore, condom use can be encouraged through HIV education and social support delivered by the *mami*'s that are employed to supervise female employees on the job and in company-provided dormitories. Venue managers' frequent communication to both sex workers and clients concerning the venue's condom use policies and the importance of their use would help to ameliorate some of the gender-based power disparities that hamper women's request to male patrons for safer sex (Yang et al. 2010).

From a policy perspective, possibly only social and structural changes in Indonesia that result in better life chances for economically vulnerable women, including education and employment, can help to curb entry into sex work and ameliorate the economic conditions that promote unsafe sex. Also, local regulations regarding prostitution need to be changed to support establishment owners' efforts at encouraging HIV risk reduction and to help them avoid jeopardising their business by agreeing to promote condom use. With support from an employer and acceptance by clients, a sex worker is likely to be more comfortable using condoms to lower her probability of contracting HIV. Special HIV prevention efforts also must be made to target freelance workers who see clients outside of an employer relationship. Successful strategies to do so include identifying and training key sex worker indigenous leaders whose beliefs, practices and behaviours are seen and imitated by others (Wiebel 1993). Domestic/Indonesian clients can also be reached for further HIV prevention messages at their work places (MAP 2005).

This study has moved toward a more comprehensive approach via inclusion of the effects of sex work venue on FSWs' condom use. The finding has shown that condom use among sex workers is a multilevel phenomenon that is unevenly practiced in Senggigi across FSWs, venues, and clients. By using hierarchical linear modeling, the investigator was able to examine a diverse, multilevel set of predictors that might be associated with sex workers' condom use. Although these data highlight the importance of addressing condom use as a multilevel phenomenon, there are several limitations that must be acknowledged. First, this work relies on self-reported quantitative and qualitative data regarding sensitive behaviours and may be subject to recall and self-presentation bias (Bancroft 1997; Harrison and Hughes 1997). Attempts to decrease these biases were made by building rapport with respondents and assuring them of privacy and confidentiality. Second, the number of units nested at each level was relatively small, which may lead to less precise quantitative findings. This is generally not considered problematic, however, when employing hierarchical modeling because of the robust nature of these estimation methods (Raudenbush et al. 2004; Luke 2004). Third, our venue and client data were all based on proxy reporting by the FSWs, and our ability to verify the sex workers' reports of managerial style or to collect in-depth information regarding additional client-level variables of possible importance was limited. We also do not know who initiated condom use (e.g., whether sex workers or clients), during each sexual encounter. Such information might be useful in explaining why the women were more likely to use condoms with foreign versus domestic clients. Finally, our analysis did not include the full range of behavioural and psychological constructs at the individual level that have been found to affect condom-use. These variables include

commitment to safe sex, self-efficacy, self-esteem, perceived personal future, personal sense of HIV vulnerability, and peer behaviours and influences. Future research may benefit from using hierarchical linear modeling to examine to what extent, if any, these factors differ in their effect by venue type.

Given that rates of HIV are rising among Indonesia's female sex workers, further research is needed to extend the findings from this study to more effectively guide prevention efforts. Several recommendations for future research seem salient. First, larger sample sizes per venue are needed to more precisely identify the multilevel determinants of sex workers' condom use. Second, studies are needed to identify and explain a broader array of venue-level risk factors. Third, issues of power, gender, and violence that characterise the sex industry across Indonesia likely pose strong barriers to HIV risk-reduction in some settings and great opportunities for prevention in others (Hull, Sulistyaningsih, and Jones 1999; Lim 1998). These factors warrant exploration in future venue-driven studies. Finally, our study focused on condom use among clients, but condom use among a wider range of partners (e.g. husbands and/or boyfriends) also merits further investigation.

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Figure 1.
Multilevel model of the influence of sex work venue, FSW and client-level variables on FSW's condom use

Table 1

Characteristics of female sex workers by sex work venue (N=115)

	Freelance n=47	Brothel n=39	Entertainment n=29	Test statistic for difference between the groups (p-value)
Demographic characteristics				
Age (years)				
Mean	24	27	31	F _(df=2) =11.44
SD	5.6	5.2	9.0	p<0.0001
Age category				
<= 25 years	34 (72%)	18 (46%)	11 (38%)	χ ² _(df=2) =10.34
> 26 years	13 (28%)	21 (54%)	18 (62%)	p=0.0057
Education (%)				
<= elementary school	12 (26%)	30 (77%)	14 (48%)	χ ² _(df=2) =10.34
Junior high school and higher	35 (74%)	9 (23%)	15 (52%)	p<0.0001
Length of work at the sex work venue (years)				
Mean	2	1	2	F _(df=2) =0.33
SD	3.7	2.1	3.8	p=0.7232 (ns)
Years worked				
Mean	3	3	4	F _(df=2) =0.39
SD	3.8	4.1	4.8	p=0.6803 (ns)
Place of Origin (%)				
Lombok	29 (62%)	35 (90%)	2 (7%)	< 0.0001 (fisher exact test)
Non Lombok	18 (38%)	4 (10%)	27 (93%)	
Marital Status				
Ever married	27 (57%)	34 (87%)	24 (83%)	χ ² _(df=2) =11.34
Never married	20 (43%)	5 (13%)	5 (17%)	p=0.0034
Number of FSWs who reported Senggigi as their first sex work site (%)				
Lombok's origin	28/42 (67%)	34/36 (94%)	1/19 (5%)	<0.0001 (fisher exact test)
Non Lombok's origin	14/42 (33%)	2/36 (6%)	18/19 (95%)	
HIV/AIDS related variable				
HIV knowledge of modes of transmission				
Mean score	8	6	7	F _(df=2) =3.58
SD	3.0	3.4	3.6	p=0.031

Table 2

Client's characteristic by sex work venue (N=326)

	Frequency(%)			Test statistic for difference between the groups (p-value)
	Freelance N=139	Brothel N=116	Entertainment n=71	
Condom use	67 (53%)	39 (31%)	20 (16%)	$\chi^2_{(df=2)}=9.87$ $p=0.007$
Age category				
<= 35 years	70 (50%)	91 (78%)	30 (42%)	$\chi^2_{(df=2)}=30.54$
> 36 years	69 (50%)	25 (22%)	41 (58%)	$p=0.000$
Type of client				
New	82 (59%)	65 (56%)	33 (46%)	$\chi^2_{(df=2)}=3.02$
Regular	57 (41%)	51 (44%)	38 (54%)	$p=0.220$
Origin of client				
Domestic/Indonesia	75 (54%)	112 (97%)	62 (87%)	$\chi^2_{(df=2)}=69.62$
Foreigner	64 (46%)	4 (3%)	9 (13%)	$p=0.000$

Table 3

Multilevel analysis of the relationship between condom use and sex work venue, female sex worker and client level predictors

Variable	Odd Ratios (OR)	95% Confidence Interval (CI)	p-value
Client-level predictors			
New clients (1=yes)	1.06	0.63-1.76	0.827
Domestic/local Indonesian (1=yes)	0.30	0.11-0.78	0.014
Female sex worker-level predictors			
Ever married (1=yes)	2.79	1.03-7.60	0.044
<= elementary school (1=yes)	0.57	0.16-2.03	0.381
Lombok's origin (1=yes)	0.89	0.36-2.22	0.799
Younger age-less than 25 years old (1=yes)	1.17	0.61-2.26	0.627
Knowledge of HIV transmission	1.05	0.91-1.21	0.489
Sex work venue-level predictors			
Management style (Supervised by non-supportive venue managers/owners)	0.40	0.09-1.70	0.195
HIV/AIDS-related policies and services were offered at the sex work venue (Yes)	1.46	0.41-5.22	0.535

With the exception of song guiders employed at Karaoke bars, the women tended to have been born on Lombok Island but outside of Senggigi