

Contextual Factors of STI/HIV-Related Sexual Partnership in a Southern US City

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INTRODUCTION

STI/HIV clusters in communities plagued by a myriad of adverse social and economic conditions including: high levels of poverty, crime and incarceration; lack of educational and job opportunities; lack of housing; broken families; a high female/male sex ratio. Contextual factors such as these are assumed to be important underlying determinants of STI/HIV transmission, though they are not well understood (Adimora and Schoenbach 2005). Factors of the social context can affect individuals directly, if they experience the factor themselves, or indirectly, if they live in neighborhoods affected by high levels of these adverse conditions. Improved understanding of contextual factors of STI/HIV transmission at both the individual- and neighborhood-levels is needed.

The study examined the associations of STI/HIV-related sexual behavior and three factors of the social context that affect both individuals and their surrounding environment, and that have influenced STI/HIV - poverty, substance abuse and incarceration - in an urban area of North Carolina, a state greatly affected by STI/HIV. Analyses were based on sexual behavior survey data from a sample of individuals interviewed at venues identified by community informants as social places where people go to meet sex partners.

The first objective of this study was to measure the associations of recent high levels of new/multiple sex partnership and contextual factors experienced at the *individual level* (the respondent was considered exposed if he or she reported experiencing the contextual factor on the survey). Individual-level exposure to a contextual factor of STI/HIV could differ among individuals who socialize at venues greatly affected by adverse social conditions, and who are hence surrounded by high levels of poverty, substance abuse and/or incarceration, compared with those who socialize at other venues not highly affected by these adverse factors. Therefore, we also measured associations of sex partnership and individual-level exposure to contextual variables, stratified by respondent's exposure to the variable at the venue.

The second study objective was to measure the associations of recent high levels of new/multiple sex partnership experienced at the *venue level* (the respondent was considered exposed to if interviewed while socializing at a venue at which a high proportion of the venue population reported experiencing the contextual factor on the survey). Again, venue-level exposure to a contextual factor of STI/HIV could affect individuals differently, depending on their own person social and economic situations. Hence, we measured the associations of sex partnership and exposure to the contextual variable at the venue, stratified by respondent's own exposure to the contextual variable.

METHODS

Study design

The chosen study area was an urban, central NC city with elevated levels of STI/HIV, substance abuse, crime, poverty and incarceration. Local program planners needed data to design STI/HIV prevention programming that is targeted in locations within the city where STI/HIV transmission is most likely. Therefore, our research team, composed of leaders representing the local Health Department and non-governmental organizations, members of the University of North Carolina's Carolina Population Center and members of the University of North Carolina's Center for AIDS

Research, conducted the PLACE method in the study town from August through October 2005. The PLACE method was implemented to identify the geographic areas and social venues within these areas where levels of new, multiple and concurrent sex partnership are high and condom provision is low, areas where elevated STI/HIV incidence is likely. Cross-sectional sexual behavior survey data were collected to measure the unmet need for STI/HIV prevention programming among individuals socializing at identified venues.

The research team conducted three stages of interviewing. In the first stage of interviewing, community informants assumed to be knowledgeable about their city were recruited for a brief interview, during which time they responded to the question, "Where do people in this town go to meet new sex partners?" Each informant provided the name of the venue, the type of venue and the precise venue location, so that each venue could later be revisited. Local health officials identified a diverse list of community informants, so that locations and types of venues were varied. Based on informant reports, a list of all venues and events in the study areas was compiled.

The second interviewing stage involved visits to each of the unique venues named by community informants to verify the location and interview a person knowledgeable about the venue, such as a manager, owner or on-site worker. A total of 146 unique venues were named by community informants. Of these, 9 were closed temporarily, 10 were closed permanently and 3 were not located because the address was insufficient. Interviews were attempted at the 124 identified venues. At one venue all potential respondents were too young to participate. Of the remaining 123 eligible venue representatives, 96 agreed to participate (78%).

Venue representatives reported on venue characteristics, including the potential to meet sex partners on site and HIV/AIDS intervention activity. In cases when the venue had no "owner" or "worker," including venues such as streets, public parks or abandoned lots, the interview was conducted with a person knowledgeable about the venue, such as a nearby resident or a person who socialized at the venue. Though community informants reported both fixed venues and periodic events (e.g., dances, special music events), it was only possible to verify venues. If the venue was closed at first visit, the interviewer returned at least three times to attempt the interview.

During the third phase of interviewing, a structured face-to-face sexual behavior survey was administered to a representative sample of individuals socializing at a stratified, random sample of venues. To ensure that the selection of venues represented different populations within the study area, the venues were categorized based on venue type prior to randomization. Strata included "Adult bars and clubs," "Eating establishments," "Public areas," "Hotels/Housing," "Open-air venues" and "Private Homes." Within each strata of venue type, venues were randomly chosen with a probability proportional to the number of venues in the strata.

The number of interviews attempted at each venue was based on venue size; venue size was assessed based on the number of men and women who socialize daily on venue, reported by venue managers during the Venue Verification Interviews. At small venues (average of <20 persons socializing onsite), medium venues (20 – 50 persons socialize) and large venues (greater than 50 persons socialize), 8, 12-16 and 18-24 interviews were attempted, respectively. Interviewers attempted to interview two men for every one woman, as prior studies have indicated that men tend to outnumber women at social venues by about two to one.

To select a representative sample of individuals socializing at the venues, interviewers followed a protocol that distributed interviewers systematically throughout the venue. For example, when the interviewing team entered a venue with four walls, each interviewer claimed either the right or the left corner at the front of the venue, and each visualized an imaginary line that traversed the venue area

diagonally to the opposing corner. Each interviewer recruited the target number of potential respondents at even intervals along the imaginary line. Venues that did not have four walls utilized an adaptation of this method to distribute the probability of interview selection throughout the venue. Interviewers brought the respondents to a private area to assure confidentiality during the interview. If a potential respondent had already been interviewed and he or she reported this to the interviewer, the recruitment was ended.

Before each interview, interviewers explained the purpose and scope of the study and obtained a verbal informed consent for a confidential and anonymous 15 to 20 minute interview. No compensation was systematically offered to respondents. However, if appropriate, interviewers provided a small snack or token gift (value of less than \$1) to respondents.

The study was approved by the UNC-CH School of Public Health Institutional Review Board. Funding for the study was provided through the University of North Carolina's Center for AIDS Research.

Measures

Contextual factors

Three factors of the social context were examined in this analysis: poverty, substance abuse and incarceration. These were examined at the individual and venue levels, an indicator of environmental-level exposure to the variable.

Individual-level exposure to contextual factors

Three poverty indicators were examined: Employment status (Dichotomous: Employed full- or part-time, Not Employed), Housing status (Dichotomous, indicating where the respondent slept the night before the interview: Household residence, Street/shelter) and Food insecurity (Dichotomous: Respondent worried about food security for self or family in the four weeks prior to the survey, No worry about food security).

One substance abuse indicator was examined (Dichotomous: Used injection drugs, crack/cocaine, methamphetamine, ecstasy, or speed in the past 12 months, No substance abuse in the past 12 months).

Two incarceration indicators were examined: Respondent incarceration (Dichotomous: Ever been incarcerated for at least 24 hours, No history of incarceration) and Incarceration of respondent's partner (Dichotomous: Ever had a partner who had been incarcerated for at least 24 hours or greater, No history of incarceration).

Venue-level exposure to contextual factors

The venue-level prevalence of each contextual variable among patrons interviewed at each venue was computed. A respondent was considered exposed to the venue-level variable if he or she socialized at a venue in which the venue-level prevalence of the variable was in the highest 25th percentile of all venue-level prevalence values. All analyses with venue-level variables were restricted to the individuals interviewed at venues where at least 10 individuals in total were interviewed to improve stability of venue-level prevalence estimates.

STI/HIV-related sexual behavior outcome

The outcome examined in all analyses was respondent's report of a recent new or multiple partnership (Dichotomous: Had at least one new or more than one partnership in the four weeks prior to the survey, No new/multiple partnership in the four weeks prior to the survey).

Data Analysis

All analyses were performed in STATA Version 8.0.

Univariate frequencies and/or means of demographic, socio-economic and relevant behavioral variables were calculated separately for men and women.

The associations between reports of new/multiple partnerships in the month prior to the survey and individual-level exposure to contextual variables were first estimated. We then estimated associations of sex partnership and individual-level exposure to contextual variables, stratified by respondent's exposure to the variable at the venue. Finally, we examined the associations of sex partnership and exposure to the contextual variable at the venue level, stratified by respondent's own exposure to the contextual variable.

All Prevalence Ratios (PR) and 95% Confidence Intervals (95% CIs) for the associations between reports of new/multiple partnerships in the month prior to the survey and individual-level exposure to contextual variables were estimated using the Huber-White robust variance estimator (Williams 2000) in a binomial regression model, to account for clustering by the venue where the individual was interviewed.

For all analyses, both unadjusted PRs and 95% CIs and PR and 95% CIs adjusted for individual-level demographic, socio-economic and substance abuse variables were estimated. Control variables included: Gender (Dichotomous: Male, Female); Age (Dichotomous: Aged 18-24, Aged >24); Race (Dichotomous: White/Other, African American); Legally Married (Dichotomous: Yes, No); Education (Dichotomous: High school grad or greater, No graduation from high school); Employment (Dichotomous: Employed full- or part-time, Not Employed); Substance abuse (Dichotomous: Used injection drugs, crack/cocaine, methamphetamine, ecstasy, or speed in the past 12 months, No substance abuse in the past 12 months).

RESULTS

Identification of venues where people meet new sexual partners

Community informants (N=120) identified 143 social venues, including open-air venues such as streets and parks (22% of venues), stores (19%), restaurants (17%) and bar/clubs (9%). Maps of social venues indicate that social venues are distributed widely throughout the study area (see Figure 1).

Study population characteristics

A stratified, random sample of 53 venues was selected for individual interviews. It should be noted that 4 of these venues were "super-sites" composed of 6 to 8 geographically proximal mini-sites. At five of the 53 venues no interviews were completed; there were very few individuals socializing and the one person at each venue who was approached for the interview refused to participate. A total of 373 individuals recruited while socializing on-site agreed to participate (75% participation rate).

Table 1 presents the demographic, socio-economic and behavioral characteristics of the 373 individuals interviewed. Men were, on average, slightly older than women (mean ages 33 and 31 years, respectively). Approximately two-thirds of the sample was African American. Unemployment was reported by about 40%, and recent worry about food security was common among men (17%) and women (21%). History of ever having been incarcerated was also common among both men and women, and more than one-fifth of men interviewed had been incarcerated in the past year. Substantial proportions visited the venues where the interview was held each day (46% men, 37% women).

STI/HIV-related risk behaviors were also commonly reported. Over one-third of men and 20% of women reported used of at least one illicit substance in the past year; use of crack/cocaine was particularly common. About 60% of men and 46% of women reported having either one new more than one sex partner in the past 4 weeks. In addition, greater than 15% of both men and women reported given or receiving money, goods, drugs or services for sex in the past 4 weeks. While levels of sex partnership were high, reported condom use was high among men (81%) and women (71%). At least half of men and women had ever been tested for HIV, though receiving an HIV test in the year prior to the survey was less common (20% men, 15% women).

Associations of new/multiple sex partnership and contextual factors at the individual level

The associations between the outcome of new/multiple partnership in the past month and individual-exposure to contextual factors were modest (Table 2). Variables that were associated after controlling confounding variables were: substance abuse in the 12 months prior to the survey (Unadjusted PR: 1.62, 95% CI: 1.29, 2.01; Adjusted PR: 1.49, 95% CI: 1.17, 1.89); ever having been incarcerated (Unadjusted PR: 1.56, 95% CI: 1.30, 1.86; Adjusted PR: 1.24, 95% CI: 1.01, 1.52); and having a partner who had been incarcerated (Unadjusted PR: 1.57, 95% CI: 1.08, 2.27; Adjusted PR: 1.20, 95% CI: 0.92, 1.56). Most of the poverty indicators (unemployment, food insecurity and homelessness) were not associated with new/multiple partnership when adjusting for individual-level demographic and substance abuse variables.

Associations of new/multiple sex partnership and contextual factors at the individual level, stratified by venue-level exposure to the contextual factor

The associations between new/multiple sex partnership and exposure to the contextual variables at the individual level were modified by exposure to the variable at the venue. At venues where the highest proportions of individuals reporting the contextual factor (top 25th percentile of all venue-level prevalence values), the respondent's direct exposure to contextual factors were generally associated with new/multiple partnership. However, at venues in the bottom 75th percentile of venues for the contextual factor, being exposed to the factor at the individual level was not generally associated with new/multiple sex partnership, or these factors were more modestly associated with new/multiple partnership than at venues in the top 25th percentile.

For example, substance abuse was associated with new and multiple partnership at venues with both high and low venue-level prevalence values for substance abuse, though modification of the association was present. Specifically, at the venues for which the venue-level prevalence of substance abuse was in the top 25th percentile, individuals who reported using an illicit substance in the past year were more than twice as likely to have had a new/multiple partnership in the past month than individuals at the same venues who had no history of substance abuse in the past year (Unadjusted PR: 2.10, 95% CI: 1.34, 3.30; Adjusted PR: 2.31, 95% CI: 1.21, 4.40). At venues where venue-level prevalence of substance abuse was in the bottom 75th percentile, individuals who

reported a history of substance abuse in the past year were also more likely than their counterparts at these venues who did not use illicit substances to report new/multiple partnership, (Unadjusted PR: 1.54, 95% CI: 1.00, 2.37; Adjusted PR: 1.46, 0.94, 2.28), though the association was not as strong as was observed at venues where large proportions were affected by substance abuse.

Likewise, at venues where the highest proportions of individuals reported ever having been incarcerated, individuals who had a history of incarceration were more likely to report new/multiple partnership than those who had never been incarcerated (Unadjusted OR: 2.29, 95% CI: 1.76, 2.96; Adjusted OR: 1.50, 95% CI: 1.18, 1.90). At venues where the highest proportions of women reported ever having a partner who was incarcerated, women who had ever had a partner who was incarcerated were more likely to report new/multiple partnership than women socializing at the same venues who had not had a partner incarcerated (Unadjusted OR: 1.51, 95% CI: 0.86, 2.65; Adjusted OR: 1.33, 1.00, 1.76). These associations between incarceration history and sex partnership were not observed at venues in the bottom 75th percentile for venue-level prevalence of incarceration and partner incarceration. As observed above, poverty indicators were generally not associated with new/multiple partnership, regardless of stratification.

Associations of new/multiple sex partnership and contextual factors at the venue level, stratified by individual-level exposure to the contextual factor

When controlling for individual-level demographic, socio-economic, and substance abuse factors, no associations were observed between new/multiple sex partnership and venue-level exposure to high levels of contextual factors, whether poverty, substance abuse or incarceration.

DISCUSSION NOTES (To be further discussed in the full paper)

Contextual factors experienced at the individual level were associated with individual-level STI/HIV-related sexual behavior. Modest, though statistically significant associations were observed between new/multiple partnership and contextual variables at the individual-level when controlling for confounders, including substance abuse, incarceration, partner incarceration (Table 2). The results of the analysis lead us to conclude these variables are independent contributors to STI/HIV-related sexual behaviors. The high prevalence of these variables in the community indicates that though the magnitude of the effect is small, they are relevant when thinking at the public health, population-level.

STI/HIV prevention programs that tailor messages to individuals with a history of substance abuse and/or incarceration would hence be appropriate. The next question that arises is, "Where in the study area do we do to implement such programs?" We identified venues throughout the study area (Figure 1), and there are individuals history of incarceration and substance abuse socializing at sites spread throughout the area. However, Table 3 indicates that STI/HIV prevention efforts should first target individuals with a history of substance abuse and/or incarceration at **certain** venues, those with the highest proportions of venue patrons reporting these variables. For example, when implementing programs to address substance abuse in the context of STI/HIV prevention, we should start at the venues with the highest level of substance abuse, because those who are socializing at these venues and who have been using illicit substances were more than twice as likely to report STI/HIV-related sexual behavior. Drug use was not as strongly associated with STI/HIV-related behaviors at venues with lower venue-level prevalence of substance abuse.

There is no evidence to indicate that socializing at a venue with high levels of context factors is associated with new/multiple partnership, when adjusting for individual-level exposures (Table 4). However, as indicated above, including the venue as a variable in the analysis has been important for

indicating where interventions that reach individuals with histories of substance abuse, incarceration should be targeted.

REFERENCES

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Williams, R. L. A note on robust variance estimation for cluster-correlated data. 2000. *Biometrics* 56: 645-646.

Figure 1. Spatial Distribution of Sites where People Meet New Sex Partners Identified in an Urban North Carolina Setting with High Levels of STI/HIV (2005)

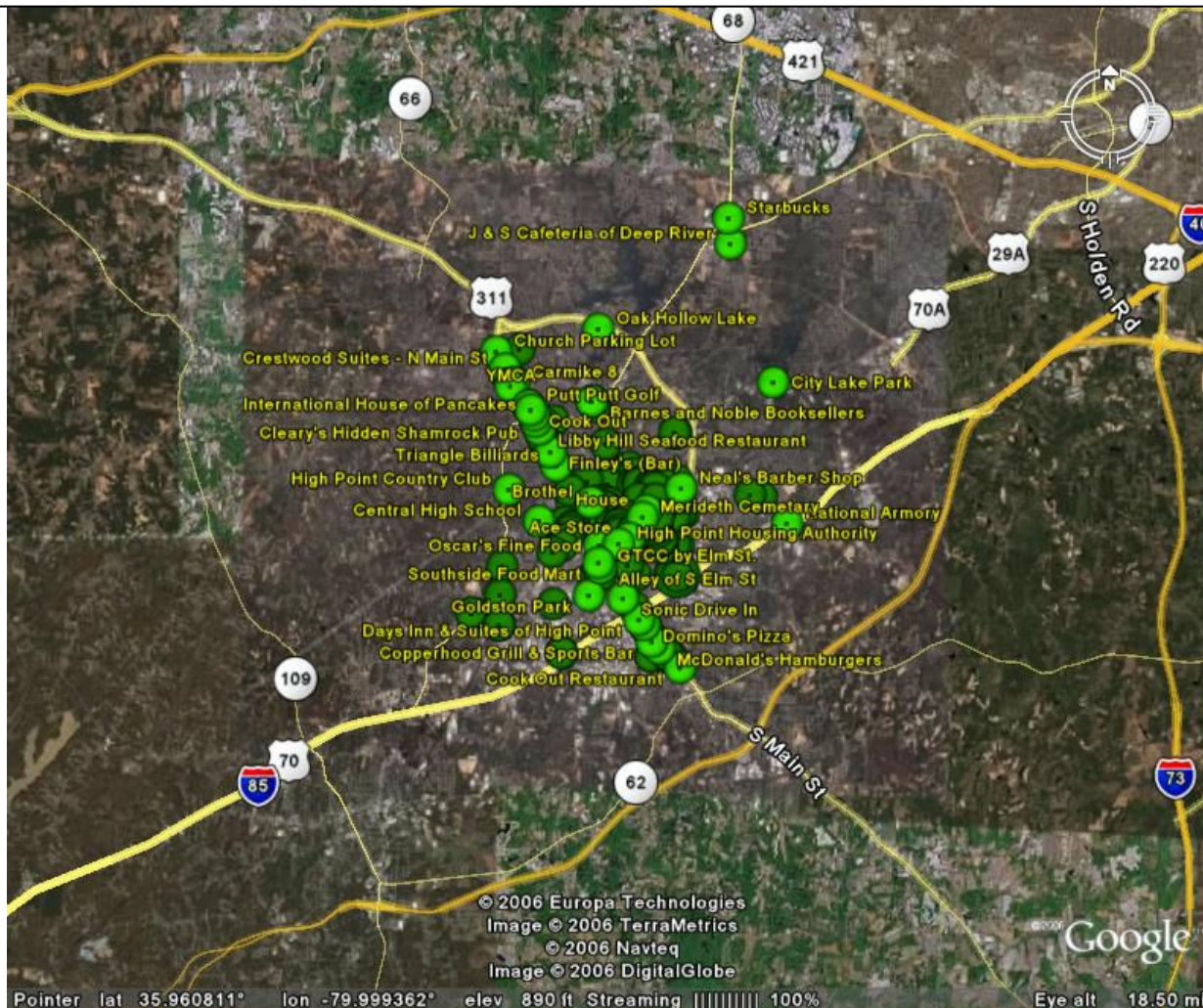


Table 1. Demographic, socio-economic and behavioral characteristics of the study population.

	<u>Men</u> N=229	<u>Women</u> N=144
Mean age of patrons	33 years	31 years
Percentage of patrons who:		
Are aged 18-24	30.3%	31.29%
Are African American	67.2%	65.1%
Are employed full or part time	62.3%	62.6%
Have worried about having enough food in the past 4 weeks	17.2%	20.6%
Have ever been incarcerated for at least 24 hours	41.6%	27.9%
Have been incarcerated in the past year	20.8%	--
Are currently a student	13.0%	21.1%
Do not live in High Point	6.5%	6.8%
Visit the venue daily	45.5%	37.4%
Have used any illicit drugs in the past 12 months*	32.5%	19.7%
Have injected drugs in the past 12 months	5.2%	2.7%
Have used crack/cocaine in the past 12 months	30.3%	18.4%
Have used methamphetamine/ecstasy in the past 12 months	6.9%	3.4%
Have used speed in the past 12 months	5.6%	2.7%
Have given or exchanged money for sex in the past 4 weeks	15.2%	17.0%
Had a new sexual partner in the past 4 weeks	49.8%	38.1%
Had a new sexual partner in the past 12 months	64.9%	52.4%
Of these, % using condom with last new partner	81.3%	71.4%
Had more than one sexual partner in the past 12 months	65.8%	51.7%
Had sex with a man in the past 12 months (men only)	10.3%	--
Had a sex partner 10 years older in past year	9.1%	21.8%
Had a sex partner 10 years younger in past year	25.1%	21.1%
Had a symptom of an STI in the past 3 months	7.8%	15.0%
Been tested for HIV in the past 12 months	49.4%	58.5%
Been tested for HIV more than 12 months ago	21.2%	15.0
Rate of Sexual Partnerships		
High: 1+ new partners or 2+ partners past 4 weeks	59.3%	45.6%
Moderate: 1+ new or 2+ partners past 12 months	71.4%	58.5%
Low: : 0-1 sexual partner in the past 12 months	31.6%	48.3%

*Injected drugs or used crack/cocaine, methamphetamine, ecstasy, or speed.

Table 2. Unadjusted and adjusted associations of new/multiple partnership in the past 4 weeks and contextual factors - poverty, drug use and incarceration history - experienced at the individual level, among individuals interviewed at social venues (N=373).

	Unadjusted*		Adjusted for demographic and socio-economic variables†		Adjusted for demographic and socio-economic† and substance abuse‡	
	PR	95% CI	PR	95% CI	PR	95% CI
Individual-level social factors (based on respondent report)						
<u>Socio-economic factors</u>						
Education						
High school or vocational school graduate, or higher education	Ref		Ref		Ref	
Did not graduate from high school or vocational school	1.08	(0.90, 1.30)	1.06	0.86, 1.31	1.02	0.87, 1.18
Employment						
Full or part-time	Ref		Ref		Ref	
Unemployed	1.13	0.94, 1.36	0.96	0.78, 1.19	0.90	0.71, 1.14
Housing (where respondent slept the night before interview)						
A household residence	Ref		Ref		Ref	
Shelter/Street	0.96	0.71, 1.29	0.94	0.65, 1.35	0.77	0.54, 1.10
Food insecurity (worried about food for self/family in past 30 days)						
No	Ref		Ref		Ref	
Yes	1.12	0.88, 1.44	1.13	0.86, 1.47	1.03	0.78, 1.35
<u>Substance abuse in past 12 months‡</u>						
No	Ref		Ref			
Yes	1.62	1.29, 2.01	1.49	1.17, 1.89	-----	-----
<u>Incarceration History</u>						
Ever been incarcerated for at least 24 hours						
No	Ref		Ref		Ref	
Yes	1.56	1.30, 1.86	1.31	1.09, 1.59	1.24	1.01, 1.52
Ever had a partner was ever incarcerated for at least 24 hours (among women only)						
No	Ref		Ref		Ref	
Yes	1.57	1.08, 2.27	1.62	1.19, 2.20	1.20	0.92, 1.56

*Standard errors for all associations were adjusted for non-independence of responses due to clustering by site of the interview (Huber-White robust variance estimator).

†Adjusted for individual-level demographic and socio-economic variables: Gender (Dichotomous: Male, Female); Age (Dichotomous: Aged 18-24, Aged >24); Race (Dichotomous: White/Other, African American); Legally Married (Dichotomous: Yes, No); Education (Dichotomous: High school grad or greater, No graduation from high school); Employment (Dichotomous: Employed full- or part-time, Not Employed).

‡Substance abuse (Dichotomous: Used injection drugs, crack/cocaine, methamphetamine, ecstasy, or speed in the past 12 months, No substance abuse in the past 12 months).

Table 3. Associations of new/multiple partnership in the past 4 weeks and individual-level exposure to the variable, stratified by exposure to the contextual factor at the venue, among individuals interviewed at social venues (N=291).*

	Respondents who socialized at sites that had among the highest proportions [†] of patrons reporting contextual variables				Respondents who did NOT socialize at sites that had among the highest proportions [†] of patrons reporting contextual variables				
	Unadjusted [‡]		Adjusted ^{‡§}		Unadjusted [‡]		Adjusted ^{‡§}		
	PR	95% CI	PR	95% CI	PR	95% CI	PR	95% CI	
Contextual variables at the individual level (respondent-reported)									
<u>Socio-Economic</u>									
Employment Status									
Full or part-time	Ref		Ref		Ref		Ref		
Unemployed	1.42	1.30, 1.55	1.34	0.97, 1.81	1.15	0.87, 1.52	0.86	0.71, 1.03	
Housing (Where respondent slept last night)									
A household residence	Ref		Ref		Ref		Ref		
Homeless	0.99	0.66, 1.49	0.78	0.62, 0.97	1.89	1.65, 2.15	1.26	0.88, 1.80	
Food insecurity in past 30 days									
No	Ref		Ref		Ref		Ref		
Yes	1.60	0.93, 2.73	1.42	0.74, 2.73	.95	0.66, 1.37	1.00	0.72, 1.40	
<u>Substance abuse</u>									
Used injection drugs, crack/cocaine, methamphetamine, ecstasy, or speed in past 12 months									
No	Ref		Ref		Ref		Ref		
Yes	2.10	1.34, 3.30	2.31	1.21, 4.40	1.54	1.00, 2.37	1.46	0.94, 2.28	
<u>Incarceration</u>									
Ever having been incarcerated for at least 24 hours									
No	Ref		Ref		Ref		Ref		
Yes	2.29	1.76, 2.96	1.5	1.19, 1.90	1.40	1.14, 1.71	1.19	0.91, 1.55	
Ever having a partner was ever incarcerated for at least 24 hours (among women only)									
No	Ref		Ref		Ref		Ref		
Yes	1.51	0.86, 2.65	1.33	1.00, 1.76	1.31	0.46, 3.77	0.63	0.10, 4.16	

*Individuals who socialized at venues where at least 10 individuals were interviewed were included in the analysis, to improve stability of venue-level prevalence estimates of contextual factors.

[†]Sites that had among the highest proportions of patrons affected by poverty, substance abuse or incarceration were in the top 25% of all sites for prevalence of the contextual variable of interest.

[‡]Standard errors for all associations were adjusted for non-independence of responses due to clustering by site of the interview (Huber-White robust variance estimator).

[§]Adjusted for individual-level demographic, socio-economic and substance-abuse variables: Gender (Dichotomous: Male, Female); Age (Dichotomous: Aged 18-24, Aged >24); Race (Dichotomous: White/Other, African American); Legally Married (Dichotomous: Yes, No); Education (Dichotomous: High school grad or greater, No graduation from high school); Employment (Dichotomous: Employed full- or part-time, Not Employed); Substance abuse (Dichotomous: Used injection drugs, crack/cocaine, methamphetamine, ecstasy, or speed in the past 12 months, No substance abuse in the past 12 months).

Table 4. Associations of new/multiple partnership in the past 4 weeks and exposure to the contextual variable at the venue, stratified by respondent's own exposure to the contextual variable, among individuals interviewed at social venues (N=291).*

	Respondents who reported exposure to the contextual factor				Respondents who did NOT report the contextual factor				
	Unadjusted†		Adjusted‡		Unadjusted†		Adjusted‡		
	PR	95% CI	PR	95% CI	PR	95% CI	PR	95% CI	
Contextual variables at the venue level:									
Whether respondent socialized at a site that had among the highest proportions§ of patrons reporting ...									
<u>Socio-Economic</u>									
Employment Status									
Full or part-time	Ref		Ref		Ref		Ref		
Unemployed	1.01	0.73, 1.39	1.02	0.74, 1.41	0.81	0.66, 1.01	0.65	0.57, 0.75	
Housing (Where respondent slept last night)									
A household residence	Ref		Ref		Ref		Ref		
Homeless	0.47	0.35, 0.65			0.90	0.74, 1.10			
Food insecurity in past 30 days									
No	Ref		Ref		Ref		Ref		
Yes	1.24	0.76, 2.03	1.00	0.58, 1.71	0.74	0.58, 0.94	0.70	0.51, 0.96	
<u>Substance abuse</u>									
Used injection drugs, crack/cocaine, methamphetamine, ecstasy, or speed in past 12 months									
No	Ref		Ref		Ref		Ref		
Yes	0.90	0.67, 1.21	0.95	0.67, 1.36	0.66	0.42, 1.03	0.60	0.34, 1.08	
<u>Incarceration</u>									
Ever having been incarcerated for at least 24 hours									
No	Ref		Ref		Ref		Ref		
Yes	1.15	0.97, 1.36	0.99	0.79, 1.24	0.70	0.52, 0.95	0.78	0.54, 1.13	
Ever having a partner was ever incarcerated for at least 24 hours (among women only)									
No	Ref		Ref		Ref		Ref		
Yes	1.38	0.47, 3.99	1.61	0.80, 3.26	1.20	0.78, 1.84	0.92	0.62, 1.37	

*Individuals who socialized at venues where at least 10 individuals were interviewed were included in the analysis, to improve stability of venue-level prevalence estimates of contextual factors.

†Standard errors for all associations were adjusted for non-independence of responses due to clustering by site of the interview (Huber-White robust variance estimator).

‡Adjusted for individual-level demographic, socio-economic and substance-abuse variables: Gender (Dichotomous: Male, Female); Age (Dichotomous: Aged 18-24, Aged >24); Race (Dichotomous: White/Other, African American); Legally Married (Dichotomous: Yes, No); Education (Dichotomous: High school grad or greater, No graduation from high school); Employment (Dichotomous: Employed full- or part-time, Not Employed); Substance abuse (Dichotomous: Used injection drugs, crack/cocaine, methamphetamine, ecstasy, or speed in the past 12 months, No substance abuse in the past 12 months).

§Sites that had among the highest proportions of patrons affected by poverty, substance abuse or incarceration were in the top 25% of all sites for prevalence of the contextual variable of interest.