Published in final edited form as:

AIDS Behav. 2012 February ; 16(2): 323–333. doi:10.1007/s10461-011-9954-6.

Concurrent sexual partnerships among urban African American high-risk women with main sex partners

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Abstract

To determine correlates of concurrent sexual partnerships among high-risk low-income urban African American women, survey responses of 337 women who had main sexual partners for over six months and reported high-risk behaviors were analyzed; 142 of these women also reported other sexual partnerships within the past 90 days. Unadjusted analyses showed that concurrency was significantly associated with relationship status, sexual debut, forced sex, incarceration of self and partners, depression, drug use, known or suspected partner nonmonogamy, and partner drug use. Age of sexual debut, relationship status, and indicators of problem drug use remained significantly associated with concurrency when controlling for individual factors, and only indicators of problem drug use and known or suspected partner nonmonogamy remained significantly associated with concurrency when also controlling for partner characteristics. Our results suggest the presence of extensive sexual networks within this population and document the need for interventions that address drug abuse and partnership instability. Moreover, the strong association between concurrency and perceptions of partners' nonmonogamy suggest the need for intervention to target men and women in this core group.

Keywords

sexual networks; concurrency; HIV/AIDS; African Americans

Introduction

African Americans are more likely to become infected with, and die from, HIV/AIDS than any other ethnic or racial group in the United States (U.S.). Although they represent only 12% of the population, African Americans account for 45% of new infections each year. Incidence of HIV among Black men is approximately 6 times higher than White men, and among Black women incidence is about 15 times higher than White women [1].

Reported sexual behaviors including the number of sex partners and condom use do not adequately account for the observed racial disparities observed in the U.S. [2,3]. Using data from wave III of Add Health pertaining to 11 STI risk behaviors, Hallfors and colleagues [3] found that while White young adults engaging in high-risk behaviors were at elevated risk for STIs, Black young adults were at high risk even when they did not participate in high-risk behaviors. African Americans may therefore be more likely to acquire HIV through low-risk behaviors as a result of living in a risk environment where the prevalence of HIV in the population is high [2,4]. As a result, population-level parameters of sexual behavior,

such as sexual networks, have increasingly been examined to understand the spread of HIV and other STIs [5-8].

A key component of sexual networks, or groups of people linked directly or indirectly through sexual contact, that drives the transmission of HIV is concurrency [7]. Concurrent sexual partnerships are generally understood as sexual relationships that overlap in time [9,10], although operational definitions differ [11-13], and different forms of concurrency have been described [10,14,15]. The UNAIDS Reference Group on Estimates, Modeling, and Projections, however, recently proposed a standard definition and measure. The proposed definition of concurrent sexual partnerships is overlapping partnerships where sexual intercourse with one partner occurs between two acts of intercourse with another partner; the proposed standard measure is a point prevalence of concurrency [16]. Although concurrency has been identified as a key component for HIV prevention campaigns, particularly in southern and eastern Africa, empirical evidence linking concurrency and HIV/STIs has been inconclusive [13,17-19].

Previous research among randomly selected population samples in the U.S. has shown that non-Hispanic Black women are more likely to have concurrent partnerships than other ethnic and racial groups [6,20-22]. Among female respondents of the National Survey of Family Growth cycle 6 (2002), for example, Adimora and colleagues [6] identified the cumulative prevalence of concurrent sexual partnerships in the past 12 months to be 4.3% for Hispanic women, 5.3% for non-Hispanic White women, and 10.0% for Black women (7.0%, 7.3%, 16.3%, respectively, when adjusted for underreporting). Contextual factors, including the low sex ratio resulting largely from increased male mortality and incarceration, are believed to dramatically affect the formation of sexual networks in African American communities and promote concurrent partnerships [6,7]. Few studies, however, have considered concurrency in African American populations at high risk for HIV [23]. This paper adds to the literature by examining correlates of concurrent sexual partnerships among a sample of African American women living in a low-income urban area at high risk for HIV and other STIs who report main sexual partnerships and behaviors that increase their risk for HIV/STIs. Specifically, we sought to identify the demographic, psychosocial, and partner characteristics that were associated with having a main sex partner as well as other sex partners.

Methods

This study utilized data from the CHAT Project, a social network based HIV/STI prevention study targeted at women in Baltimore, Maryland. The CHAT Project was designed to train women to become peer mentors, who would then discuss HIV and STI risk reduction strategies with their social network members. The CHAT Project included index and network participants. Index participants were recruited through targeted street outreach, flyers, and referrals from health clinics and community agencies. Index participants contacted our research clinic to participate in a brief screening assessment. Eligibility criteria for index participants included: 1) female, 2) between the ages of 18 and 55 years, 3) self-reported heterosexual sex in the past six months, and 4) have one of the following risk behaviors: more than one sex partner in the past six months, have a risky partner who engages in risky behavior (e.g. injection drug user, HIV+ partners, or male who had sex with other men), or snorted/sniffed or smoked heroin or cocaine. Exclusion criteria included injection drug use in the past six months and being enrolled in the study as a network participant.

Eligible index participants participated in a baseline study visit. At the visit, participants completed a network inventory, which outlined individuals in their social network, roles

played (i.e. social support, sex partner, etc.) and their characteristics. Based on this inventory, network members who were eligible to participate in the study were identified by study staff. A list was given to the index participants. To be eligible as a network participant, the individual had to be 18 years or older and one of the following: injected drugs within the past six months, had sex with the index in the last 90 days, or the index felt comfortable discussing HIV and STIs with the network participant and interacts with that network participant at least a few times a month. Network participants could be men or women. The only exclusion criterion for network participants was previous enrollment in the study as an index participant.

Index participants were invited to refer up to five eligible network members into the study. Index participants received \$10 for each network member who completed a baseline visit. Once a network member completed a baseline visit, the index participant was eligible to be randomized into a peer education intervention or control condition. (For more details about the intervention see [24]). Both index and network participants completed the same baseline survey, administered through trained interviewers and Audio Computer Assisted Software (ACASI), and were provided HIV antibody testing (OraSure HIV testing). Participants were compensated with \$35 for completion of the visit. The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved the study protocol and materials. The current study focused on baseline data collected from September 2005 through July 2007.

Main Partner Concurrency and Inclusion in Present Study

For this study, women were considered to be in concurrent partnerships if they reported having a main sexual partner for longer than six months but also multiple sexual partners during the past 90 days. A total of 746 eligible participants completed the baseline survey; the participants were predominately women (76%) and African American (96.6%). Of the 548 African American women who completed the baseline survey, 402 reported having a main sexual partner, of which 337 had had that main sexual partner for more than six months. These 337 African American women were included in this analysis: 195 who had a main sexual partner for longer than six months and reported only one sexual partner in the last 90 days, and 142 who had a main partner for more than 6 months and reported more than one sexual partner in the past 90 days. There are 262 indexes and 75 network members in this sample.

Data Analysis

Univariate, bivariate, and multivariate analyses were conducted with SPSS Software (version 18.0). The following factors were considered: age, education, income from any source, current employment status, current living situation, recent homelessness, relationship status, sexual history, incarceration history, depression, drug use, and partner characteristics. Education was dichotomized as high school diploma / GED equivalent or lower. Since only a small number of women in this population were married, relationship status was dichotomized as in a committed relationship (whether married or not) or not in a committed relationship. Homelessness and incarceration were reported for the previous six months. Depression was assessed using the Center for Epidemiologic Depression Scale (CES-D) [25]. A CES-D score of 16 or higher was used as a cutoff score for having a high level of depressive symptoms. Since drug use is common in this population, variables that indicate problem drug use (exchanging sex for drugs in the past six months, sex while high half or more of the time in the past 90 days, and ever admitted to a detoxification program) were combined in the multivariate analyses and the constructed variable was dichotomized as none or one or more indicator of problem drug use. Partner characteristics reported by the female participant were, within the previous 90 days, number of sex partners with a history of incarceration, number of sex partners with other sex partners, and sex partners' drug use

(such as heroin, cocaine, or crack) in the past six months. These variables were dichotomized as none or one or more. Partner characteristics were included in analyses to better understand the sexual networks of the women participants and because of the established importance of partner characteristics on sexual risk behaviors [6,22,26] and STIs [27-29].

Two multivariate models were constructed: one examining the associations between the individual level factors and main partner concurrency, and one examining the associations between the individual level factors and partner characteristics and main partner concurrency. Variables were included in these models based on previous research that has shown an association with the outcome. Participant type (index or network) was also controlled for in each multivariate model.

Since behaviors and other variables among the index and recruited network participants could be correlated with each other, all analyses used generalized estimating equations (GEE) to obtain odds ratios and confidence intervals, using the index and recruited network members as the cluster [30].

Results

Demographic Information

This analysis included 262 indexes and 75 network members (Table 1). Little difference was observed among these groups, although the age distribution of index and network participants differed ($\chi^2 = 9.21$, $p = 0.027$), index participants were more likely to have smoked crack or cocaine in the past 3 months ($\chi^2 = 10.76$, $p = 0.001$), and were more likely to be in concurrent partnerships ($\chi^2 = 15.00$, $p < 0.001$). The mean age of the 337 African American women who participated in this study was 41 (sd = 7.96). As shown in Table 2, this cohort had low educational attainment, with 51% not completing high school or a GED equivalent, a large percentage was unemployed but seeking work (46.3%), had high crack cocaine use in the last three months (56.5%), and most scored high on the CES-D (75.7%). Only 1.8% of women reported injection drug use in the past six months (not shown). Crack cocaine use was high and injection drug use was infrequent due in part to noninjection drug use being one possible selection criteria for participation in the CHAT Project, and thus indicators of drug dependence were also considered; 61.3% of the women had previously been admitted into a detoxification program, 27.6% reported having sex high half or more of the time in the past 90 days, and 66.1% had engaged in sexual activity to obtain drugs in the past six months.

Factors Associated with Main Partner Concurrency

The results of the bivariate analysis are presented in Table 2. Age, education, income, employment status, living situation, length of main partnership, recent homelessness, crack/cocaine use, and having sex while drunk were not significantly associated with main partner concurrency. Women reporting that they were not in a committed relationship were almost 2 times as likely to have concurrent relationships (OR = 1.87, 95% CI: 1.20, 2.91, $p = 0.006$). Women who sexually debuted at age 15 or younger were also 2 times as likely to report being in concurrent partnerships (OR = 2.15, 95% CI: 1.06, 4.33, $p = 0.033$), as were women who had ever been forced to have sex as an adult (OR = 1.75, 95% CI: 1.06, 2.88, $p = 0.029$). Being incarcerated in the previous six months and having a partner ever be incarcerated both increased the odds that a woman was in concurrent sexual relationships (OR = 2.00, 95% CI: 1.03, 3.89, $p = 0.041$ and OR = 1.63, 95% CI: 1.01, 2.64, $p = 0.045$). Although smoking crack or cocaine was not associated with main partner concurrency, women in concurrent partnerships were 1.6 times as likely to have been admitted to a

detoxification program (OR = 1.63, 95% CI: 1.01, 2.65, $p = 0.047$), 3 times as likely to report having sex when high half the time or more in the last 90 days (OR = 3.34, 95% CI: 1.57, 7.11, $p = 0.002$), and 2 times as likely to report having sexual relations with someone to buy drugs in the last six months (OR = 2.35, 95% CI: 1.30, 4.24, $p = 0.004$). Additionally, women in concurrent partnerships were more likely to report drug use among sex partners (OR = 1.89, 95% CI: 1.22, 2.93, $p = 0.005$). Although the sample had a large proportion of women reporting depressive symptoms, women in concurrent partnerships were more likely to have a CES-D score of 16 or greater (OR = 1.67, 95% CI: 1.00, 2.80, $p = 0.05$). Women in concurrent sexual partnerships were much more likely to report that their partners also had other sexual partners (OR = 30.16, 95% CI: 13.8, 66.0, $p < 0.001$). Of the 288 women in this cohort who took an OraSure HIV test at the time of the survey, 7.3% resulted in a positive outcome; no difference was observed for women in monogamous relationships and women in concurrent relationships.

Sexual Partnerships

The 337 women in this analysis reported a total of 870 sex partners in the past 90 days (mean = 2.59, sd = 11.01). Twenty women reported sexual relations with women, totaling 27 female partners (3.1%) named (not shown). Women in concurrent sexual relationships reported an average of 4.74 (sd = 16.8) sexual partners in the past 90 days (Table 3). These were largely reported as exchange partners. The women knew or suspected that an average of 1 (sd = 8.4) partner injected drugs, while fewer knew or suspected that their male partners had sex with men, was HIV-positive, or had an STI. When considering the past nine months, women in a concurrent sexual partnership reported a mean of 8.49 (sd = 42.8) sexual partners. Women who reported multiple sex partners in the previous nine months were more likely to currently be in concurrent relationships and have a partner who is known or suspected to have other sexual partners (Figure 1).

Multiple Logistic Models

The results of the multivariate models are shown in Table 4. When controlling only for individual characteristics, relationship status, age of sexual debut, and indicators of problem drug use remained significantly associated with main partner concurrency. When controlling for individual factors and partner characteristics, only indicators of problem drug use and having a partner(s) with other known or suspected sexual partners remained significantly associated with main partner concurrency. Women reporting one or more partners having other sexual partners were 45 times as likely to be in concurrent sexual partnerships themselves (OR = 44.6, 95% CI: 14.32, 138.8, $p < 0.001$) when controlling for other individual and partner characteristics. In this model, being in a committed relationship was only moderately significantly associated with main partner concurrency (OR = 1.79, 95% CI: 0.90, 3.54, $p = 0.10$). Partner drug use and partner incarceration are not affected by removing known or suspected partner nonmonogamy, and the significant variables remain relationship status (OR = 2.69, 95% CI: 1.55, 4.69, $p < 0.001$), indicators of problem drug use (OR = 4.23, 95% CI: 1.59, 11.28, $p = 0.004$), and sexual debut before 15 years of age (OR = 2.76, 95% CI: 1.08, 7.03, $p = 0.033$) similar to Model 1 (not shown).

Discussion

Among this urban sample of low-income high-risk African American women with main sex partners, a number of individual and partner characteristics were significantly associated with main partner concurrency, including relationship status, sexual history, incarceration of self and partner, indicators of problem drug use, partner drug use, and known or suspected partner nonmonogamy. Income and education, however, were not significant in this cohort,

as has been found elsewhere [6,20,31]. The characteristics of this sample are comparable to other cohorts of the low-income populations in Baltimore [32,33].

Relationship status was significantly associated with main partner concurrency, as has been demonstrated elsewhere [6,20,22,23], although this association was only moderately significant when controlling for partner characteristics. All of the women in this study had a main sexual partner for more than six months, but only some identified this partnership as a committed relationship. Those self-identifying as in a committed relationship were less likely to be in concurrent partnerships in the unadjusted and multivariate model controlling for individual factors. Most research in general, and about concurrency in the U.S., considers marital status separated from other relationship categories. However, low marriage among African American women is common in the U.S., and not limited to this cohort, and is the result of numerous factors including historical ties to slavery, norms, a small male marriageable pool resulting from unemployment and incarceration, and the scarcity of Black men due to higher mortality rates and incarceration [34-36].

The scarcity of men is thought to greatly influence marriage specifically, but also the prevalence of concurrent sexual partnerships in particular, by encouraging men to enter into relationships with multiple women, and women to engage in partnerships with men who are already attached, while simultaneously discouraging women to terminate relationships with men who are not monogamous [37,38]. How these concurrent relationships occur, however, differ. Gorbach and colleagues [15], for example, identified six main forms of concurrency among men and women in Seattle, Washington: experimental, separation, transitional, reciprocal, reactive, and compensatory. The authors also discuss other forms of concurrency that were identified in the interviews: group sex, coparents (with other main partners), and survival sex (exchanging sex for money or drugs).

One of the reasons men in African American communities are scarce is the disproportionately high rate of incarceration [39]. Although incarceration has been argued to greatly influence the prevalence of concurrency among African Americans, this study found incarceration of the participant and incarceration of sexual partners to be significant only in the unadjusted analyses. However, a large proportion of incarceration among African Americans is drug related [40,41], and drug use in this population is common with over half of the women reporting that they smoked crack or cocaine in the previous three months. Women in concurrent sexual partnerships were more likely to have ever been admitted to a detoxification program, report having sex when high half of the time or more, and were more likely to have sex to buy drugs. Thus, this may indicate more frequent use and high levels of drug dependency. Additionally, women with concurrent sexual partnerships were more likely to report drug use among their partners in the past six months. Together, these associations suggest that drug use may be an important driving force in concurrency.

The association between women with concurrent partnerships having partners with other known or suspected sex partners has been documented elsewhere as well [6,23,31]. Women in concurrent partnerships with men who are also in concurrent partnerships may be at heightened risk for HIV and other STIs through direct concurrency (specifically, through having multiple partners), as well as through indirect concurrency (their partner's concurrency and the risk of their partner infecting them) [42, 43]. Along with the higher number of sexual partners reported by these women, this association suggest that these women belong to extensive sexual networks [6].

A major strength of this research is that it provides detailed information about concurrent sexual partnerships among low-income African American women within a community with high risk of HIV, thus addressing a gap in the literature. However, there are several

limitations. Since this research included only urban African American women residing in a community with high levels of drug use, depression, and STIs, the results may not be generalizable. This paper presents results based on a nonrandom sample, which may introduce selection bias. The women were provided \$35 for their participation. There is evidence that monetary incentives are more effective in recruiting African American respondents and respondents living in poverty [44,45]. The incentive provided represents norms in the community for study participation. The behaviors considered were self-reported, and may be subject to recall and social desirability bias, with specific selection criteria for a randomized controlled trial for HIV prevention among high-risk women who were not injection drug users and their network members. Our research center had other studies that included injection drug users at this time, and thus we do not anticipate that women altered their responses for the purpose of being eligible for the study and the incentive. Additionally, the women in the study reported on their partners' sexual behaviors. Some studies [46,47] have demonstrated poor agreement between partner reports' of concurrent relationships, although others have found good agreement [48]. Typically, people overestimate their partners' relationships or fail to recognize their partners' fidelity. Caution should be used when interpreting wide confidence intervals. This paper considers only women identified as being in a concurrent sexual partnership in the past 90 days. We cannot distinguish between short-term and long-term concurrency or types of concurrency, and we do not address norms in this cohort regarding monogamy and nonmonogamy. Finally, the study was cross-sectional and therefore limits the ability to make causal inferences.

Conclusions

This study aimed to describe associations of concurrent sexual partnerships among high-risk low-income urban African American women at increased risk of HIV and other STIs. The association of women in concurrent partnerships and partners in concurrent partnerships suggests the presence of extensive sexual networks that may be important in producing disparities in HIV among African Americans in the United States. High drug use overall along with the evidence that the women in concurrent partnerships had greater issues with drug use and dependence, and the increased reported drug use among their partners suggest a heightened need for interventions to address drug abuse. Although important, individual interventions are not adequate to address high substance abuse in low-income communities, and must be combined with interventions that address low educational attainment, unemployment, discriminatory rates of arrest and incarceration, and unequal access to medical and social services [32,49,50]. Together, these issues promote drug dependency and deter stability in partnerships [51,52]. The high perceived concordance among individuals with concurrent partnerships suggests that a network approach may be an effective method of reaching men and women with concurrent partners for risk reduction interventions.

Acknowledgments

This work was funded by the National Institute on Mental Health (Grant# R01 MH66810).

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Figure 1.
Current partnership status by number of reported sex partners in the past 9 months

Table 1

Demographic characteristics of index (n = 262) and network (n = 75) participants in the CHAT Project

	Index n (%)	Network n (%)	Total n (%)
Age ^a			
18-34	35 (13.4)	20 (26.7)	55 (16.3)
35-44	134 (51.1)	30 (40.0)	164 (48.7)
45-54	88 (33.6)	22 (29.3)	110 (32.6)
≥ 55	5 (1.9)	3 (4.0)	8 (2.4)
Education			
Less than high school diploma	139 (53.5)	32 (42.7)	171 (51.0)
High school diploma / GED equivalent	121 (46.5)	43 (57.3)	164 (49.0)
Income from any source in last 30 days			
≤ \$999	229 (87.4)	62 (83.8)	291 (86.6)
\$1,000 - \$1,999	29 (11.1)	12 (12.2)	38 (11.3)
≥ \$2,000	4 (1.5)	3 (4.1)	7 (2.1)
Current employment status			
Employed full time	16 (6.1)	10 (13.3)	26 (7.7)
Employed part time	17 (6.5)	7 (9.3)	24 (7.1)
Unemployed but seeking work	124 (47.3)	32 (42.7)	156 (46.3)
Unemployed and not seeking work	18 (6.9)	4 (5.3)	22 (6.5)
Disabled	87 (33.2)	22 (29.3)	109 (32.3)
Current living situation			
Homeowner	17 (6.5)	5 (6.7)	22 (6.5)
Renter	80 (68.7)	52 (69.3)	232 (68.8)
Live with someone for free	43 (16.4)	11 (14.7)	54 (16.0)
Other	22 (8.4)	7 (9.3)	29 (8.6)
Homeless in last 6 months			
Yes	72 (27.5)	13 (17.3)	85 (25.2)
No	190 (72.5)	62 (82.7)	252 (74.8)
Age of sexual debut			
< 15 years	71 (27.6)	22 (29.7)	93 (28.1)
15-19	138 (53.7)	39 (52.7)	177 (53.5)
≥ 20	48 (18.7)	13 (17.6)	61 (18.4)
Relationship status			
Committed relationship	124 (47.3)	39 (52.0)	163 (48.4)
Non-committed relationship	138 (52.7)	36 (48.0)	174 (51.6)
Smoked crack or cocaine in last 3 months ^b			
Yes	160 (61.3)	30 (40.0)	190 (56.5)
No	101 (38.7)	45 (60.0)	146 (43.5)
Main partner concurrency ^b			
Yes	125 (47.7)	17 (22.7)	142 (42.1)

	Index	Network	Total
	n (%)	n (%)	n (%)
No	137 (52.3)	58 (77.3)	195 (57.9)

^a
p < 0.05

^b
p ≤ 0.001

Table 2

Associations, odds ratios (ORs), and 95% confidence intervals (95% CIs) between individual characteristics and concurrent sexual partnerships among African American women in participating in the CHAT Project (n=337)

	n (%)	OR (95% CI)	p-value
Age			
18-34	55 (16.3)	1.86 (0.40, 8.58)	0.427
35-44	164 (48.7)	1.15 (0.26, 5.06)	0.852
45-54	110 (32.6)	1.07 (0.24, 4.70)	0.929
≥ 55 (ref)	8 (2.4)	1.00	
Education			
Less than high school diploma (ref)	171 (51.0)	1.00	
High school diploma / GED equivalent	164 (49.0)	0.86 (0.56, 1.33)	0.501
Income from any source in last 30 days			
≤ \$999	291 (86.6)	0.90 (0.20, 4.07)	0.888
\$1,000 - \$1,999	38 (11.3)	1.83 (0.35, 9.61)	0.473
≥ \$2,000 (ref)	7 (2.1)	1.00	
Current employment status			
Employed full time (ref)	26 (7.7)	1.00	
Employed part time	24 (7.1)	1.61 (0.54, 4.80)	0.391
Unemployed but seeking work	156 (46.3)	1.14 (0.50, 5.60)	0.757
Unemployed and not seeking work	22 (6.5)	0.94 (0.31, 2.89)	0.92
Disabled	109 (32.3)	0.73 (0.30, 1.75)	0.481
Current living situation			
Homeowner (ref)	22 (6.5)	1.00	
Renter	232 (68.8)	0.62 (0.27, 1.44)	0.267
Live with someone for free	54 (16.0)	1.08 (0.43, 2.67)	0.873
Other	29 (8.6)	0.93 (0.32, 2.75)	0.901
Homeless in last 6 months			
Yes	85 (25.2)	1.58 (0.96, 2.54)	0.058
No (ref)	252 (74.8)	1.00	
Age of sexual debut			
< 15 years	93 (28.1)	2.15 (1.06, 4.33)	0.033
15-19	177 (53.5)	1.84 (0.96, 3.53)	0.066
≥ 20 (ref)	61 (18.4)	1.00	
Ever forced to have sex (since 18 years old)			
Yes	88 (26.1)	1.75 (1.06, 2.88)	0.029
No (ref)	249 (73.9)	1.00	
Relationship status			
Committed relationship (ref)	163 (48.4)	1.00	
Non-committed relationship	174 (51.6)	1.87 (1.20, 2.91)	0.006
Time together with main sex partner			
7-12 months	32 (9.5)	0.99 (0.46, 2.13)	0.969

	n (%)	OR (95% CI)	p-value
1-5 years	144 (42.7)	1.12 (0.71, 1.76)	0.623
More than 5 years (ref)	161 (47.8)	1.00	
Partner(s) has other sexual partner(s)			
Yes	88 (26.1)	30.16 (13.8, 66.0)	
No (ref)	249 (73.9)	1.00	<0.001
Partner(s) ever incarcerated			
Yes	208 (61.7)	1.63 (1.01, 2.64)	0.045
No (ref)	129 (38.3)	1.00	
Incarcerated within last 6 months			
Yes	42 (12.5)	2.00 (1.03, 3.89)	0.041
No (ref)	295 (87.5)	1.00	
Smoked crack or cocaine in last 3 months			
Yes	190 (56.5)	1.07 (0.69, 1.64)	0.773
No (ref)	146 (43.5)	1.00	
Ever admitted to a detoxification program			
Yes	182 (61.3)	1.63 (1.01, 2.65)	0.047
No (ref)	115 (38.7)	1.00	
Had sex when drunk in last 90 days			
Never (ref)	112 (48.9)	1.00	
Less than half the time	70 (30.6)	1.01 (0.59, 1.75)	0.965
Half the time or more	47 (20.5)	2.57 (0.96, 6.90)	0.061
Had sex when high in last 90 days			
Never (ref)	53 (21.8)	1.00	
Less than half the time	123 (50.6)	1.60 (0.82, 3.140)	0.168
Half the time or more	67 (27.6)	3.34 (1.57, 7.11)	0.002
Hooked up with others to buy drugs			
Not in last 6 months (ref)	78 (33.9)	1.00	
In last 6 months	152 (66.1)	2.35 (1.30, 4.24)	0.004
Partner(s) drug use in past 6 months			
Yes	143 (42.4)	1.89 (1.22, 2.93)	0.005
No (ref)	194 (57.6)	1.00	
Center for Epidemiologic Studies Depression Scale (CES-D) score			
< 16 (ref)	82 (24.3)	1.00	
≥ 16	255 (75.7)	1.67 (1.00, 2.80)	0.050
OraSure HIV test			
Positive	21 (7.3)	1.20 (0.49, 2.94)	0.688
Negative (ref)	267 (92.7)	1.00	

Table 3

Mean number of sex partners among women with concurrent sexual partnerships by personal and partner characteristics (n=142)

Characteristic	Mean (SD)
Number of partners in past 90 days	4.74 (16.8)
Number of main partners	1.03 (0.5)
Number of exchange partners	2.72 (16.8)
Number of casual partners	0.90 (1.2)
Number of 90 day sex partners you know or suspect	
Injects drugs	1.02 (8.4)
Has sex with men	0.18 (0.6)
Is HIV+	0.33 (1.2)
Has an STI	0.30 (1.2)
Number of sex partners in past 9 months	8.49 (42.8)

Table 4

Multivariate models for factors associated with concurrent sexual partnerships among African American women in the CHAT Project controlling for individual characteristics (Model 1) and individual and partner characteristics (Model 2)^a (n=268)

Variable	Model 1: AOR (95% CI)	Model 2: AOR (95% CI)
Age		
18-34	1.26 (0.12, 13.15)	15.78 (0.98, 255.3)
35-44	1.10 (0.12, 9.68)	6.96 (0.52, 92.53)
45-54	1.17 (0.13, 10.19)	11.19 (0.81, 154.4)
≥ 55 (ref)	1.00	1.00
Education		
Less than high school diploma (ref)	1.00	1.00
High school diploma / GED equivalent	1.22 (0.71, 2.09)	0.61 (0.28, 1.34)
Age of sexual debut		
< 15 years	2.64 ^d (1.05, 6.60)	2.79 (0.66, 11.85)
15-19	1.94 (0.88, 4.28)	2.80 (0.83, 9.41)
≥ 20 (ref)	1.00	1.00
Relationship status		
Committed relationship (ref)	1.00	1.00
Non-committed relationship	2.47 ^f (1.45, 4.21)	1.79 (0.90, 3.54)
Incarcerated within last 6 months		
Yes	2.04 (0.96, 4.34)	2.28 (0.82, 6.39)
No (ref)	1.00	1.00
Indication of high drug use or dependence ^b		
Yes	4.55 ^e (1.70, 12.17)	2.98 ^d (1.02, 8.75)
No (ref)	1.00	1.00
Smoked crack or cocaine in past 3 months		
Yes	1.13 (0.65, 1.97)	0.97 (0.48, 1.95)
No (ref)	1.00	1.00
Partner(s) has other sexual partner(s) ^c		
Yes	---	44.6 ^f (14.32, 138.8)
No (ref)	---	1.00
Partner(s) ever incarcerated ^c		
Yes	---	1.41 (0.59, 3.35)
No (ref)	---	1.00
Partner(s) drug use in past 6 months ^c		
Yes	---	1.38 (0.67, 2.87)
No (ref)	---	1.00

^a Models control for the variables shown in the table and participant type (index or network)

^b Indicators of problem drug use were reporting exchanging sex for drugs in the past 6 months, having sex while high half or more of the time in the past 90 days, and ever admitted to a detoxification program

^c prior 90 days, known or suspected

^d $p \leq 0.05$

^e $p \leq 0.01$

^f $p \leq 0.001$