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TIMING AND DURATION OF INCARCERATION AND HIGH-RISK SEXUAL PARTNERSHIPS AMONG AFRICAN AMERICANS IN NORTH CAROLINA

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Abstract

Purpose—Incarceration may contribute to HIV transmission by disrupting stable partnerships and promoting high-risk partnerships. We investigated incarceration and high-risk partnerships among African Americans in North Carolina (NC).

Methods—We conducted a weighted analysis using the NC Rural Health Project (N=320), a population-based case-control study of HIV among African Americans. We measured associations between timing and duration of incarceration and high-risk partnerships (multiple partnerships or sex trade for money or drugs).

Results—Duration of incarceration appeared to be more important than how long ago incarceration occurred. After adjustment for socio-demographic indicators, high-risk partnerships were associated with short-term (<1 month) incarceration of the respondent *versus* no respondent incarceration (men: adjusted prevalence ratio (aPR): 1.9, 95% confidence interval (CI): 1.2–2.8; women: aPR: 3.1, 95% CI: 1.2–8.3). High-risk partnerships were also associated with incarceration of a partner *versus* no partner incarceration (men: aPR: 1.8, 95% CI: 1.1–3.0; women: aPR: 2.0, 95% CI: 1.1–3.8). Among men, associations remained when adjusting for substance abuse. Among women, adjustment for substance abuse weakened estimates due to the strong correlation between substance abuse and incarceration.

Conclusions—HIV prevention programs targeting currently- and formerly-incarcerated individuals and their partners may decrease HIV in African American communities with high incarceration rates.

Keywords

incarceration; poverty; sexual behavior; HIV; sexually transmitted infections; African Americans; Southern US; North Carolina

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INTRODUCTION

Human immunodeficiency virus (HIV) prevalence is disproportionately high among African Americans. Though African Americans represented 12% of the United States population in 2005,¹ they accounted for nearly half of persons living with HIV/AIDS in 33 states that year² and 74% of heterosexually-transmitted HIV cases in 29 states from 1999 to 2002.³

Incarceration, endemic in many African American communities, may contribute to the racial disparity in HIV infection by disrupting stable sexual partnerships and promoting high-risk partnerships.⁴⁻⁶ Previous studies measured associations between incarceration history and participation in concurrent sexual partnerships⁷⁻⁹ and sex work.¹⁰ These studies, however, did not evaluate *duration* of incarceration or its *timing* during the individual's life course, both of which could be important factors in incarceration's potential contribution to sexual risk behaviors. More complete understanding of the dimensions of incarceration and its relationship to risk behaviors may improve HIV prevention programs.

We investigated cross-sectional associations between incarceration and high-risk sexual partnerships among African Americans in North Carolina (NC), a state with high rates of sexually transmitted infection (STI), including HIV.^{11, 12} We analyzed data from the NC Rural Health Project (RHP), a population-based case-control study conducted to investigate heterosexual transmission of HIV among African Americans in NC.¹³ The purpose of the current analysis was to capitalize on the RHP's measurement of the timing and duration of the respondent's incarceration - a unique component of its sexual behavioral questionnaire - and explore associations between multiple dimensions of incarceration and high-risk partnerships.

METHODS

The RHP

Recruitment, which occurred from January 1997 through March 2000, has been described in detail elsewhere.^{8, 9, 13} Briefly, the original case-control study area comprised 13 rural counties in eastern NC. All controls were recruited from the thirteen-county study area. Due to initial slow enrollment of HIV-positive cases, case recruitment was expanded to other NC counties. For this study on incarceration and high-risk sexual partnership, we aggregated cases and controls and applied sampling weights to obtain estimates that were generalizable to the source population that gave rise to the study sample. Since all controls were recruited from one of the original 13 counties, we restricted the case population to those who resided in one of these 13 counties.

HIV-positive cases aged 18 years and older who resided in the study area were contacted by a NC Disease Intervention Specialist (DIS) for routine HIV counseling and screened for inclusion in the RHP. The DIS referred eligible cases who provided written informed consent for release of name and contact information to the RHP. Controls were selected randomly within strata defined by gender and five-year age groups, based on the case distribution, from the 1996 NC driver's license records for all African American men and women aged 18 to 61 years residing in one of the original 13 RHP counties.¹⁴ Due to the RHP interest in heterosexually-transmitted HIV infection, exclusion criteria included self-reported history of injection drug use and, among male participants, sex with men. Eligible participants who were successfully located by RHP staff and who provided written informed consent were enrolled. Staff administered a one-hour structured face-to-face sexual behavior survey; drew a blood specimen for syphilis testing; and provided a \$50 cash incentive. Personal identifiers were removed and controls' blood specimens were also tested for HIV infection. We used sexual behavior survey data for the current study on incarceration and high-risk sexual partnerships.

Ethical Approval

The University of North Carolina, Chapel Hill (UNC-CH) School of Medicine Committee on the Protection of the Rights of Human Subjects approved the RHP. The UNC-CH School of Public Health Institutional Review Board approved the secondary analysis on incarceration and high-risk partnerships.

Measures

Outcome: High-risk partnerships—We examined a dichotomous indicator of high-risk partnerships in the past year, defined as engaging in two or more partnerships or sex trade (giving or receiving sex for money or drugs).

Exposures: Incarceration—Respondents were asked if they had spent longer than 24 hours in jail or prison in the past 10 years and, if so, they were asked to report the number of months and the last time they were incarcerated in the past 10 years. Respondents were also asked to report whether each of their three most recent sexual partners had ever spent longer than 24 hours in jail or prison.

Based on the survey items, we defined three incarceration variables, including the number of years since the respondent's most recent incarceration of longer than 24 hours (never in the past 10 years, six to 10 years ago, or within the past five years); the cumulative length of time the respondent had ever been incarcerated in the past 10 years (never for longer than 24 hours, longer than 24 hours and less than one month, or one month or longer); and sexual partnership with someone who was ever incarcerated, defined as the respondent's report that at least one of his or her last three sex partners had ever been incarcerated for longer than 24 hours (yes *versus* no).

Sampling Weights

We aggregated cases and controls and applied inverse probability weights in analyses to account for differential case and control sampling probabilities, yielding parameters that were representative of African Americans aged 18 to 61 years living in the thirteen-county study area, excluding injection drug users and men who have sex with men. The weight assigned to each observation was equivalent to the number of persons in the source population that the observation in the dataset represented.^a

Data Analysis

We performed analyses in Stata Version 8.0 (Stata Corp., College Station, TX). We calculated weighted prevalences and means of demographic, socio-economic, and behavioral variables, separately by gender.

We estimated unadjusted and adjusted prevalence ratios (PRs) and 95% confidence intervals (CI) for the associations between each incarceration exposure and high-risk partnerships using a generalized linear model with probability weights, log link, Poisson distribution without an offset,^{15, 16} and a robust variance estimator to correct for overestimation of the error term resulting from use of Poisson regression with binomial data.¹⁷ Because preliminary analyses

^aCase weights were calculated by dividing the number of newly-diagnosed African American HIV cases who resided in the thirteen-county study area and who appeared to be eligible for RHP participation (data provided to the RHP by the North Carolina state health department's HIV/STD Prevention and Care Branch) by the number of RHP HIV-positive case participants within each gender- and age-specific category. Control weights were calculated by dividing the number of African American residents of the thirteen-county study area who were *not* newly-diagnosed African American HIV cases (based on US Census Bureau 2000 estimates provided by the NC State Data Center minus the state health department's estimate of newly-diagnosed African American HIV cases) by the number of RHP control participants within each gender- and age-specific category.

indicated that most associations between incarceration and sexual partnership variables differed by gender, we included a product-interaction term between gender and each incarceration exposure to obtain gender-specific associations.

In initial multivariable models, we used a manual change in estimate backwards elimination procedure to identify the particular set of socio-demographic confounding variables necessary to include in each final model.¹⁸ We assessed confounding by the following factors, identified based on conceptual models: age at first sex; lack of high school education; homelessness in the past 10 years; food insecurity in the past month; current receipt of food stamps or welfare; and residence in an unsafe neighborhood. Age at first sex was entered as a continuous variable after confirmed linearity in the log prevalence. All other variables were dichotomous. We ensured that the PR derived from each final model was no greater than 10% different than the PR derived from the original model, which adjusted for all potential confounding variables. Indicator variables representing five-year categories of respondent's age were included in all models, as controls were selected within these strata.

In subsequent models, we controlled for two dichotomous substance abuse variables in addition to respondent age and socio-demographic factors identified in the initial model: hard drug use (used crack/cocaine or heroin in the past 10 years) and frequent alcohol or marijuana use (drank at least five alcoholic beverages per day or used marijuana at least once per week during a period in the past 10 years).

RESULTS

Enrollment of Cases and Controls

Enrollment has been described in detail previously.^{8, 9} 13 Of 444 cases who were screened by the DIS, deemed eligible, and re-located by RHP staff, 206 (46%) participated in the RHP interview. Consenting and non-consenting cases had comparable distributions of age, gender, and risk behaviors.¹³ Of 327 eligible controls who could be found, 226 (69%) participated and were confirmed to have negative HIV tests.

The 94 cases residing in the original thirteen-county area and all 226 controls, all of whom resided in this area, were included in this analysis on incarceration and high-risk partnership.

Demographic and Socio-Economic Characteristics

The mean age among men and women was 38 years and 37 years, respectively (Table 1). Seventeen percent of men and one-quarter of women (26%) were currently unemployed. Thirteen percent of men and 15% of women reported being worried about having enough food in the past month.

Prevalence of Incarceration and High-risk Partnerships

Twenty-nine percent of men and 4% of women had been incarcerated for longer than 24 hours in the past 10 years. Twenty-three percent of men and 3% of women had been incarcerated recently, within the past five years (Table 1).

In the past 10 years, 15% of men and 2% of women had been incarcerated for longer than 24 hours and less than one month. Additionally, 14% of men and 3% of women had been incarcerated for one month or greater.

More than half of women (52%) and 15% of men reported that at least one of their last three sex partners had ever been incarcerated.

In the past year, 49% of men and 28% of women were identified as having high-risk partnerships.

Associations between Incarceration and High-risk Partnerships

Timing of Respondent's Incarceration and High-risk Partnerships

Men: Men whose most recent incarceration occurred six to 10 years ago were twice as likely to report high-risk partnerships as men who were never incarcerated (unadjusted PR: 2.01, 95% CI: 1.14–3.52) (Table 2). The estimate changed minimally when adjusting for socio-demographic indicators including age, age at first sex, and socio-economic indicators. The association remained after further adjustment for substance abuse (fully-adjusted PR: 1.80; 95% CI: 1.03–3.15).

Men reporting incarceration within the past five years were somewhat more likely to report high-risk partnerships than men with no incarceration history (unadjusted PR: 1.62, 95% CI: 0.94–2.82). The association weakened considerably after adjustment for socio-demographic variables (adjusted PR: 1.28, 95% CI: 0.73–2.25) and disappeared after adjusting for substance abuse (fully-adjusted PR: 1.05, 95% CI: 0.56–1.96).

Women: Small sample size prevented estimation of reliable associations between incarceration six to 10 years ago and high-risk partnerships among women.

Women who were incarcerated within the past five years were much more likely to report high-risk partnerships than women who were never incarcerated (unadjusted PR: 3.82, 95% CI: 2.87–5.09) (Table 2). Adjustment for socio-demographic variables had little effect. When further adjusting for substance abuse, the PR weakened considerably but remained (fully-adjusted PR: 2.42, 95% CI: 1.38–4.23).

Duration of Respondent's Incarceration and High-risk Partnership

Men: Men who were incarcerated for greater than 24 hours and less than one month in the past 10 years were twice as likely to report high-risk partnerships as men with no incarceration history (unadjusted PR: 2.08, 95% CI: 1.35–3.21) (Table 2). After adjustment for socio-demographic variables, the PR was 1.86 (95% CI: 1.22–2.82). The association between incarceration and high-risk partnerships remained, although somewhat weakened, after additional adjustment for substance abuse (fully-adjusted PR: 1.71, 95% CI: 1.00–2.91).

Among men, unadjusted analyses and analyses adjusted for socio-demographic and substance abuse variables indicated that incarceration of one month or greater, compared with no prior incarceration, was not associated with high-risk partnerships (fully-adjusted PR: 0.67, 95% CI: 0.29–1.53).

Women: Women who were incarcerated for greater than 24 hours and less than one month in the past 10 years were more than twice as likely to report high-risk partnerships in the past year as women who had never been incarcerated (unadjusted PR: 2.87, 95% CI: 1.47–5.61) (Table 2). When adjusting for socio-demographic variables, the estimate strengthened but the precision decreased (adjusted PR: 3.13, 95% CI: 1.17–8.33). When further adjusting for substance abuse, the fully-adjusted PR was 2.00 (95% CI: 0.82–4.89) due to high correlations between incarceration and substance abuse.

Women who were incarcerated for one month or longer were also more than twice as likely to report high-risk partnerships as those who had never been incarcerated (unadjusted PR: 2.39, 95% CI: 1.08–5.29). Adjustment for socio-demographic characteristics weakened the association somewhat and was no longer statistically significant (adjusted PR: 2.00, 95% CI:

0.92–4.39). After further adjusting for substance abuse, the PR decreased to 1.37 (95% CI: 0.57–3.30) due to high correlations between incarceration and substance abuse. Women incarcerated for one month or longer were more likely to use hard drugs (57%) and frequently use marijuana or alcohol (81%) than women who had never been incarcerated (hard drugs: 3%, marijuana or alcohol: 17%).

Sexual Partner's Incarceration and High-risk Partnership

Men: Men reporting incarceration of at least one of the three most recent sexual partners had a higher prevalence of high-risk partnerships than men reporting none of the three most recent partners had been incarcerated (unadjusted PR: 1.57, 95% CI: 0.97–2.54) (Table 2). After adjustment for socio-demographic characteristics and substance abuse, the association between sexual partner's incarceration and high-risk partnerships strengthened (fully-adjusted PR: 1.81, 95% CI: 1.10–2.96).

Women: Women reporting that at least one of the last three most recent sexual partners had been incarcerated were more than twice as likely to report high-risk partnerships as women whose three most recent partners had not been incarcerated (unadjusted PR: 2.42, 95% CI: 1.28–4.57) (Table 2). The estimate weakened when adjusting for socio-demographic variables (adjusted PR: 2.02, 95% CI: 1.06–3.83) and when further adjusting for substance abuse (fully-adjusted PR: 1.83, 95% CI: 0.96–3.48).

DISCUSSION

Among this population-based sample of African Americans in North Carolina, excluding injection drug users and men who have sex with men, incarceration experience was widespread: more than one-fifth of men had been incarcerated within the past 5 years and half of women had a recent sexual partner who had been incarcerated. Those who were recently incarcerated and whose sexual partners had been incarcerated were much more likely to have high-risk sexual partnerships than those without exposure to incarceration. When adjusting for socio-demographic indicators, the associations between incarceration variables and high-risk partnerships weakened but persisted. Among men, associations remained when adjusting for substance abuse. Among women, adjustment for substance abuse weakened estimates due to the strong correlation between substance abuse history and incarceration experience. We interpret these findings to suggest that incarceration is closely entangled in a web of other adverse social and economic conditions that work independently and in concert to worsen the relationships and health of African Americans. A large-scale longitudinal study with frequent measurements would be needed to determine whether incarceration is causally associated with sexual risk behaviors and HIV independent of other adverse factors.

These results support existing evidence of the association between incarceration and sexual risk behaviors.^{7–10} Among a household sample of Seattle residents, men who had spent at least a night in jail were more likely to have concurrent partnerships.⁷ Previous analyses among HIV-positive⁸ and HIV-negative⁹ RHP participants revealed strong unadjusted associations between partnership concurrency and history of incarceration for longer than 24 hours in the past 10 years.

While prior studies examined dichotomous indicators of incarceration history, the current study investigated the association between timing and duration of incarceration and high-risk partnerships. The findings suggested that the duration of incarceration was more important than how long ago incarceration occurred. High-risk partnerships were more common among those reporting short-term incarceration than among those reporting long-term incarceration. A number of possible explanations for the association between short-term incarceration and high-risk partnerships exist. Because shorter sentence length is associated with shorter time

until recidivism (DeJong 1997, Gainey 2000), migration in and out of the criminal justice system may contribute to sexual partnership exchange. It is also possible that individuals serving long-term sentences for serious crimes are more disconnected from social and sexual networks due to the incarceration duration or because serious criminals may exhibit greater anti-social behaviors. They may have fewer opportunities for sexual partnerships upon release.

Findings should be interpreted with caution due to a number of study limitations. Small sample size yielded imprecise estimates in some strata and limited further exploration of duration and timing of incarceration. Further, because the original case-control study was not designed to measure the association between incarceration and high-risk partnerships, the questionnaire did not measure important aspects of incarceration, including the number of prior incarcerations or the reason for incarceration. Further investigation of personal incarceration and HIV-related sexual behaviors among a large sample is needed to ensure that gender-stratified, multivariable analyses are adequately powered.

We found that incarceration of at least one of the three most recent sexual partners was strongly associated with high-risk partnerships, further corroborating prior RHP analyses that measured robust associations between partner incarceration and partnership concurrency.^{8, 9} We lacked knowledge of the timing and duration of the partner's incarceration, an important study limitation. A study is needed to measure the effect of incarceration on the partners of prisoners.

The goal of this study was to estimate an association between incarceration and sexual risk behaviors independent of adverse factors, such as substance abuse. Adjustment for substance abuse attenuated associations between incarceration and high-risk partnerships, particularly among women, due to strong correlations between incarceration and substance abuse histories. Because those who experienced incarceration were also likely to report substance abuse, we argue that integration of substance abuse treatment into HIV prevention interventions targeting those with a history of incarceration is appropriate and may strengthen HIV prevention efforts.

The rationale for why personal or sexual partner's incarceration may contribute to sexual risk behaviors has been documented.⁴ Incarceration physically separates partners in stable relationships, which can lead to loneliness and emotional division^{20–26} and partnership dissolution.^{23, 25, 27} Absence of a stable partnership may contribute to multiple, new, or concurrent partnerships among the partners of prisoners during the incarceration²³ or among the prisoners at the time of release.²⁸

Deleterious effects of incarceration on individuals have important population-level consequences on African American health given the high prevalence of incarceration among African Americans. HIV prevention programs should target currently- and formerly-incarcerated individuals and their sexual partners and should strengthen substance abuse prevention and treatment programs for this population to help decrease HIV transmission in African American communities with high incarceration rates. Further research is needed to determine the most important factors of STI/HIV transmission among incarcerated populations, including whether the incarceration itself plays a role.

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ABBREVIATIONS

AIDS	acquired immunodeficiency syndrome
CI	confidence interval
CPC	Carolina Population Center
HIV	human immunodeficiency virus
NC	North Carolina
NCRHP	North Carolina Rural Health Project
PR	prevalence ratio
STI	sexually transmitted infection
UNC-CH	University of North Carolina, Chapel Hill

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Table 1

Demographic, Socio-economic, Substance Abuse, and Sexual Behavior Characteristics and Sexually Transmitted Infections (STIs) among African Americans aged 18–61 Years (UNC Rural Health Project, North Carolina, 1997–2000, N=320).

	Men (N=115)		Women (N=205)	
	N*	Weighted % [†]	N*	Weighted % [†]
Demographic characteristics				
Age (years)				
18–24	6	13.2	40	14.9
25–29	9	16.5	31	13.6
30–34	11	7.8	34	11.5
35–39	36	17.3	32	13.8
40–44	23	18.8	31	20.2
45–49	10	8.8	19	13.5
50–54	7	5.5	7	4.8
55–61	13	12.2	11	7.7
Marital status				
Married, lives with spouse	47	46.3	56	37.5
Married, does not live with spouse	8	1.7	17	4.1
Not married, lives with sexual partner	16	12.8	29	10.6
Not married, lives alone	43	39.2	102	47.2
Socio-economic indicators				
Educational attainment				
8 th grade or less	6	1.1	6	1.0
Some high school	24	16.9	43	17.3
High school graduate or equivalent	43	44.4	75	37.3
Vocational or trade school	9	9.0	13	6.2
Some college or 2 year degree	23	21.2	50	26.0
Finished college	9	6.3	14	9.5
Master's or other advanced degree	1	1.1	4	2.9
Annual household income in past year				
Less than \$12000	20	11.2	56	14.8
\$12–16000	12	7.5	23	11.1
\$16–25000	25	23.7	28	15.7
\$25–50000	21	25.6	43	23.7
Over \$50000	19	22.6	14	8.7
Refused/unable	18	9.5	41	26.0
Currently unemployed (not working full- or part-time for pay)				
Yes	36	16.7	74	26.0
No	79	83.3	131	74.0
Homeless in past 10 years				
Yes	16	6.5	16	3.8
No	99	93.5	188	95.2

	Men (N=115)		Women (N=205)	
	N*	Weighted % [†]	N*	Weighted % [†]
Worried about food for self or family in past month				
Yes	25	12.7	40	14.5
No	90	87.3	165	85.5
Currently receives federal aid (food stamps, welfare)				
Yes	29	9.6	86	32.5
No	86	90.4	117	65.9
Neighborhood safety				
Safe (feels quite safe or extremely safe from crime)	33	22.6	55	24.8
Unsafe (feels slightly safe or not at all safe from crime)	82	77.4	150	75.2
Incarceration history				
Time since most recent incarceration in past 10 years [‡]				
Never incarcerated in past 10 years	69	71.0	184	94.6
Prior incarceration: >24 hours 6–10 years ago	14	6.2	6	1.4
Recent incarceration: >24 hours in past 5 years	32	22.8	14	3.0
Duration of time incarcerated [‡]				
Never incarcerated in past 10 years	69	71.0	184	94.6
Short-term incarceration: >24 hours and <1 month in past 10 years	15	14.7	9	1.9
Long-term incarceration: ≥1 month in past 10 years	31	14.3	11	2.6
Incarceration of recent sexual partners [‡]				
0 of last 3 partners ever incarcerated >24 hours	82	85.5	81	47.3
1 of last 3 partners ever incarcerated >24 hours	17	11.4	66	29.1
≥2 of last 3 partners ever incarcerated >24 hours	14	3.1	57	22.6
Substance abuse history				
Ever used crack, cocaine, or heroine in past 10 years				
Yes	23	6.8	24	5.3
No	92	93.2	181	94.7
Frequent (≥once weekly) use of 5 daily alcoholic beverages or marijuana in past 10 years				
Yes	53	34.9	52	19.9
No	62	65.1	153	80.1
Sexual behavior and sexually transmitted infections (STIs)				
Age at first sex (years)				
15 or younger	63	47.5	78	32.0
16–18	42	43.3	98	52.2
19–29	10	9.2	27	14.2
Multiple (≥2) sexual partnerships in past year				
Yes	52	46.8	67	25.3
No	63	53.2	138	74.7
Concurrent sexual partnerships in past year				
Yes	45	42.9	46	19.0
No	70	57.1	159	81.0
Transactional sex in past year				

	Men (N=115)		Women (N=205)	
	N*	Weighted % [†]	N*	Weighted % [†]
Yes	18	5.9	13	2.9
No	97	94.1	191	96.1
High-risk sexual partnerships in past year (multiple partnerships or transactional sex) [§]				
Yes	58	49.1	73	27.8
No	57	50.9	131	71.3
Self-reported STI// diagnosis, lifetime				
Yes	59	48.7	100	38.0
No	56	51.3	104	62.0
Self-reported STI// diagnosis in past year				
Yes	15	5.3	24	2.9
No	98	92.7	180	97.1

* Totals may not sum to 115 among men or 205 among women due to missing values of some variables.

[†] Weighting accounted for differential sampling probabilities between HIV-positive and HIV-negative participants and yielded estimates generalizable to African Americans aged 18 to 61 years residing in the 13 eastern, rural North Carolina county study area, excluding injection drug users and men who have sex with men.

[‡] Incarceration exposure in main analysis (see Table 2).

[§] Sexual behavior outcome in main analysis (see Table 2).

// Respondents who reported being diagnosed with gonorrhea, Chlamydia infection, trichomonas, syphilis, or herpes were coded as having an STI diagnosis.

Table 2

Prevalence Ratios (PRs) and 95% Confidence Intervals (CIs) for the Associations between Incarceration History and High-risk Partnerships in Past Year among African Americans aged 18–61 Years in Eastern, Rural North Carolina (UNC Rural Health Project, North Carolina, 1997–2000, N=320).

	High-risk Sexual Partnerships in Past Year		
	%* Unadjusted PR (95% CI)*	PR (95% CI) Adjusted for Socio-demographics: Age, Sex, and Socio-economic Indicators*†	PR (95% CI) Adjusted for Socio-demographics and Substance Abuse*†‡
Respondent incarceration: time since most recent incarceration in past 10 years			
Men			
Never incarcerated in past 10 years (N=69)	40.7	1.	1.
Prior incarceration: >24 hours 6–10 years ago (N=14)	81.7 (1.14, 3.52)	2.01 (1.14, 3.52)	1.75 (1.04, 2.93)
Recent incarceration: >24 hours in past 5 years (N=32)	66.2 (0.94, 2.82)	1.62 (0.94, 2.82)	1.28 (0.73, 2.25)
Women			
Never incarcerated in past 10 years (N=184)	26.2	1.	1.
Prior incarceration: >24 hours 6–10 years ago (N=6)§	--	--	--
Recent incarceration: >24 hours in past 5 years (N=14)	99.9 (2.87, 5.09)	3.82 (2.87, 5.09)	4.01 (2.50, 6.42)
Respondent incarceration: cumulative duration of time incarcerated in past 10 years			
Men			
Never incarcerated in past 10 years (N=69)	40.7	1.	1.
Short-term incarceration: >24 hours and <1 month in past 10 years (N=15)	84.9 (1.35, 3.21)	2.08 (1.35, 3.21)	1.86 (1.22, 2.82)
Long-term incarceration: ≥1 month in past 10 years (N=31)	53.6 (0.60, 2.87)	1.31 (0.60, 2.87)	0.77 (0.34, 1.76)
Women			
Never incarcerated in past 10 years (N=184)	26.2	1.	1.
Short-term incarceration: >24 hours and <1 month in past 10 years (N=9)	75.2 (1.47, 5.61)	2.87 (1.47, 5.61)	3.13 (1.17, 8.33)
Long-term incarceration: ≥1 month in past 10 years (N=11)	62.5 (1.08, 5.29)	2.39 (1.08, 5.29)	2.00 (0.82, 4.89)
			1.37 (0.57, 3.30)

High-risk Sexual Partnerships in Past Year			
	% *	Unadjusted PR (95% CI) *	PR (95% CI) Adjusted for Socio-demographics and Substance Abuse ^{*,†,‡} at First Sex, and Socio-economic Indicators ^{*,†}
Partner incarceration: ≥1 of last 3 sexual partners was incarcerated for >24 hours[§]			
Men			
No (N=82)	45.3	1.	1.
Yes (N=31)	71.1	1.57 (0.97, 2.54)	1.83 (1.12, 2.98)
Women			
No (N=81)	16.1	1.	1.
Yes (N=123)	39.0	2.42 (1.28, 4.57)	2.02 (1.06, 3.83)

* Weighting accounted for differential sampling probabilities between HIV-positive and HIV-negative participants and yielded estimates generalizable to African Americans aged 18 to 61 years residing in the 13 eastern, rural North Carolina county study area, excluding injection drug users and men who have sex with men.

† Adjusted for respondent age plus any of the following socio-demographic variables, if identified as confounding factors in the backwards elimination strategy of variable selection: age at first sex; high school graduate; homeless in past 10 years; recent food insecurity; current recipient of federal aid (food stamps or welfare); neighborhood crime exposure.

‡ Substance abuse covariates included: hard drug use in past 10 years (ever used crack/cocaine, or heroine) and frequent soft drug use in past 10 years (drank at least five alcoholic beverages per day or used marijuana least once per week during a period in past 10 years).

§ Stratum-specific sample size too small to yield reliable estimates.