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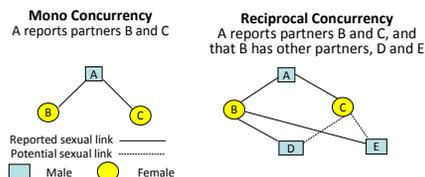
Background

Heterosexual HIV/STD Transmission

- In 2008, 22% of New York City (NYC) new HIV diagnoses (3,809) were attributable to heterosexual transmission (NYC DOHMH, 2009)
- Disproportionately affects women - 72% of new HIV diagnoses in women
- Sexual risk behaviors and sexually transmitted disease (STD) cofactors alone do not explain the heterosexual spread of HIV (Hallfors, DD et al., 2007)
- Sex partner concurrency may help to explain variation in the heterosexual spread of HIV and other STDs, e.g., in sub-Saharan Africa and US urban areas

Sex Partner Concurrency

- Overlapping sex partnerships within the same time interval
- A high prevalence of concurrency is hypothesized to:
 - Increase sexual connections among large numbers of sex partners
 - Increase the extent and rapidity of STD and HIV spread (Morris, M and Kretzschmar, M, 1997)
- Reciprocal sex partner concurrency (RSPC) is when both partners in a sexual relationship have other sex partners



Objectives

- To determine among heterosexuals in high-HIV-risk neighborhoods in NYC:
- Sociodemographic, sexual behavior, sex partner characteristics and substance use variables associated with RSPC
 - The independent effect of RSPC on STDs after accounting for risk factors that are significantly ($p < 0.05$) associated with RSPC

Methods

National HIV Behavioral Surveillance (NHBS) Study

- CDC cooperative agreement in 25 cities in the United States
- Ongoing cyclical study of MSM, IDU, and high-risk heterosexuals (HET)
- NHBS-HET data collection in 2006-7
- Cross-sectional design, repeats each at-risk group every 3 years
- Estimate HIV prevalence, risk behaviors, testing patterns, prevention services utilization
- Interviewer-administered structured survey questionnaire and HIV test
- Anonymous recruitment, survey and test

High-Risk Heterosexual Definition

- Main eligibility criteria
 - A man or woman who resides in or is recruited by someone who resides in a high-risk area (HRA)
 - HRAs include 30 NYC zip codes with the highest rates of heterosexual HIV and poverty
 - Between 18-50 years old
 - Vaginal or anal sex with opposite-sex partner in the past year
- Additional eligibility criteria
 - Resident of NYC
 - Speaks English or Spanish

Methods

Respondent-Driven Sampling (RDS)

- Seed recruitment by ethnographer (2 initial seeds each in HRAs in Harlem, Brooklyn and the South Bronx)
- Seeds reside in HRAs and are otherwise eligible
- Seeds recruit up to 3 other participants, who recruit up to 3 others
- Continues until required sample size obtained
- Incentives provided for participating and recruiting

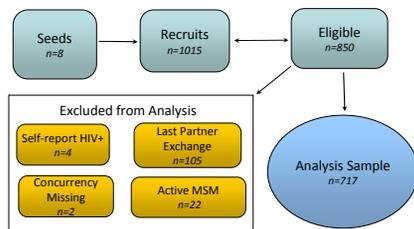
Measures

- **Reciprocal Sex Partner Concurrency:** participant reports that in the past 12 months during the participant's sexual relationship with her/his last non-exchange sex partner, both the participant and the last sex partner had sex with other people
- **Sexually Transmitted Diseases:** a self-reported STD diagnosis (gonorrhea, syphilis, Chlamydia, herpes simplex virus, genital warts, and other STDs) in the past 12 months

Statistical Analysis

- Unweighted analysis
- Crude and adjusted odds ratios (OR; AOR) and 95% Confidence Intervals (95% CI) estimated by logistic regression
- Variables significantly ($p < 0.05$) associated with RSPC included in simultaneous multivariate analysis of any STD diagnoses
- Gender, race/ethnicity, age, the number of sex partners, and the duration of the partnership included in the multivariate model
- Participant's social network size (reciprocal) included in the multivariate model as a control for selection probability

Study Sample



Results

Characteristics Associated with Reciprocal Sex Partner Concurrency

Characteristic	Total		RSPC		p
	N	%	%		
Overall	717	100.0	40.7		
Gender					0.13
Male	341	47.6	37.8		
Female	376	52.4	43.4		
Race/Ethnicity					0.81
Black	533	74.3	40.3		
Hispanic	130	18.1	43.1		
White	38	5.3	42.1		
Other	16	2.2	31.3		
Age					0.15
18-29	237	33.1	42.2		
30-39	116	16.2	47.4		
40-50	364	50.8	37.6		
Other Sociodemographics					
Non-heterosexual identity	104	14.5	61.5		<0.01
Cohabitation	82	11.4	31.7		0.08
Income <10k (PY)	476	66.4	43.3		0.06
Homeless (PY)	325	45.3	43.7		0.15
Arrested (PY)	198	27.6	41.4		0.82
Substance Use					
Drug Injection (lifetime)	138	19.3	44.9		0.27
Weekly Crack Use (PY)	140	19.5	50.0		0.01
Weekly Cocaine Use (PY)	66	9.2	57.6		<0.01
Weekly Heroin Use (PY)	66	9.2	50.0		0.11
Weekly Marijuana Use (PY)	250	34.9	49.6		<0.01
Binge Alcohol Use (PM)	301	42.0	49.8		<0.01
Past Year Sexual Risks					
Unprot. Vaginal Sex	658	91.8	42.9		<0.01
Unprot. Anal Sex	240	33.5	53.3		<0.01
>3 Total Sex Partners	325	45.3	63.1		<0.01
Last Sex Partner Characteristics					
≥5 Years Older	174	24.3	43.7		0.37
IDU	81	11.3	46.9		0.23
Used Crack	242	33.8	45.9		<0.05
Incarcerated	355	49.5	43.7		0.12
HIV-Infected or status unknown	361	50.4	52.1		<0.01
Partnership > 2 Years	343	47.8	37.0		0.06
HIV Status (n=696 tested)					0.94
Negative	644	92.5	41.0		
Positive	52	7.5	40.4		

PY: Past Year PM: Past Month

Results

Multiple Logistic Regression Model of STD Diagnoses

Characteristic	Crude		Adjusted	
	STD %	OR 95% CI	OR	95% CI
Overall	23.4	-	-	-
Gender				
Male	17.3	1.00	1.00	
Female	29.0	1.95	1.36-2.79	2.15 1.43-3.23
Race/Ethnicity				
Black	23.8	1.01	0.47-2.19	1.34 0.59-3.07
Hispanic	21.5	0.89	0.38-2.08	1.17 0.47-2.93
White	23.7	1.00	1.00	
Other	25.0	1.07	0.28-4.17	1.57 0.37-6.60
Age				
18-29	24.5	1.00	1.00	
30-39	24.1	0.98	0.56-1.65	0.83 0.46-1.47
40-50	22.5	0.90	0.61-1.32	0.92 0.57-1.49
Non-heterosexual identity	29.8	1.48	0.93-2.34	0.84 0.49-1.45
Substance Use				
Weekly Crack Use (PY)	27.9	1.34	0.88-2.04	0.96 0.57-1.59
Weekly Cocaine Use (PY)	22.7	0.96	0.52-1.75	0.74 0.38-1.43
Weekly Marijuana Use (PY)	26.0	1.24	0.87-1.78	1.15 0.77-1.71
Binge Alcohol Use (PM)	24.6	1.12	0.79-1.58	0.93 0.63-1.37
Sexual Risk Factors				
Unprot. Vaginal Sex	24.3	2.05	0.95-4.41	1.31 0.58-2.93
Unprot. Anal Sex	31.7	1.94	1.36-2.77	1.65 1.12-2.42
>3 Total Sex Partners	30.5	2.05	1.44-2.91	1.72 1.13-2.63
Last Sex Partner Characteristics				
Crack User	27.3	1.37	0.96-1.96	1.30 0.83-2.03
HIV-Infected or status unknown	25.8	1.30	0.92-1.84	1.07 0.73-1.56
Partnership >2 Years	23.9	1.05	0.75-1.49	1.15 0.79-1.67
Sex Partner Concurrency (bivariate analysis)				
Neither partner	17.6	1.00	-	-
One partner	18.1	1.04	0.62-1.72	-
Both partners	31.5	2.16	1.35-3.45	-
Reciprocal Sex Partner Concurrency	31.5	2.11	1.49-3.00	1.54 1.02-2.32

Discussion

- Many (40.7%) heterosexuals in this NYC high-risk area sample reported RSPC
- Those in sex partnerships with RSPC were twice as likely to report any STDs as those in which neither or one of the partners had other sex partners
- RSPC was independently associated with STDs after accounting for the effects of sexual, drug use and other risk factors
- RSPC is a risk factor for STDs independent of the number of sex partners
- Measuring the prevalence and pattern of sex partner concurrency may clarify inconsistent findings on the effect of sex partner concurrency on STD and HIV infection (Lurie MN, Rosenthal S, 2009)
- RSPC, in addition to sexual risk behaviors, may increase the risk of HIV infection in high-risk areas through STD cofactors and linkage into larger and more dense HIV/STD sexual transmission networks

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