

BRIDGING SEXUAL NETWORKS:

AN UPDATE WITH IMPLICATIONS FOR SYPHILIS TRANSMISSION

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WHAT ARE THE CHARACTERISTICS OF SYPHILIS EPIDEMICS IN US?

- Syphilis epidemics in US remain predominantly among MSM
 - HIV positive
 - Older
 - Minority (esp. Black)
 - Many sexual partners
 - Drug using (meth)
 - Incarcerated

WHAT IS BRIDGING? MOVING DISEASES ACROSS NETWORKS

When individuals have sex with potential to transmit infections (e.g. do not use condoms or other methods of prevention) with members of different sexual networks in the same time period (ie a man with men and heterosexual women).



BRIDING MEANS DISASSORTATIVE MIXING PATTERN

Networks made up of individuals similar on some characteristic – “assortative mixing”; when individuals have partners not alike it is “disassortative mixing”

- Age
- Sexual activity class
- Race/ethnicity
- Partnership gender pattern (male to male, male and female, male to TG, ect)
- Drug use
- Occupation (sex work, truck driver)



PREVALENCE OF HIV/STIS IN STUDIES PUBLISHED SINCE 2008

Study (time period for STI diagnosis)	HIV %			Other STIs %s		
	MSMW	MSM	MSW	MSMW	MSM	MSW
Gorbach et al. 2009 (time of study)	12	65	4			
Latkin et al. 2011	30	52	—			
Tieu et al. 2012	50	67	—			
Any STI (past year)				19	23	—
Zule et al. 2009	12	38	5			
Chlamydia, gonorrhea, or syphilis (at time of study)				5	10	6
Hepatitis C: (time of study)				22	14	19

CHARACTERISTICS OF FEMALE PARTNERS, NOT MALE PARTNERS, MAY CONTRIBUTE TO MSMW'S RISK FOR ACQUIRING HIV/STIS

- Proportionally more of MSMW's female partners than partners of MSM and MSW had ever injected drugs (30% vs 23% vs 22%, respectively). 64% of these MSMW's female partners had been under the influence of heroin, cocaine, methamphetamine, or alcohol during sex, and 65% had concurrent partners while having sex with MSMW participants ⁶ (street-based sample)
- MSMW's female partners may be more likely than other women to have multiple past-year partners (65% vs 54%) and not use condoms during their last sexual encounter (59% vs 36%).⁴² (Historically Black college study)
- Black women and Latinas who had sex with MSMW were more likely than those who did not to trade sex for drugs or money (39% vs 18%). (LA HIV testing sites)⁴³

HPTN 061: THE BROTHERS STUDY 7/09-12/11

- 061: To determine the feasibility and acceptability of a multi-component HIV prevention intervention for Black MSM, including peer health system navigation
- 1,349 men enrolled in Atlanta, Boston, Los Angeles, New York City, San Francisco and Washington, DC.
- Black MSM recruited from the community or referred by sexual partners, incentives to refer up to 5 Black sexual partners for participation in the study
- Overall, 91% self-reported being HIV-negative and 9% HIV-positive. High concordance with tests.

SEXUAL NETWORKS IN HPTN 06 I

- **52% reported serodiscordant unprotected intercourse (SDUI) with a male or female partner in the last six months;**
- **55% reported having exclusively Black sex partners and**
- **46% reported having a partner with at least a two age category difference between the participant and partner.**
- Most of the men reported having a sexual network size of fewer than six partners in the last six months; 88% reported a sexual network density of 0%
- 87% reported having sex partners who were also a part of their social networks.
- The sexual networks of Black MSM tended to be relatively small compared with other cohorts consisting of more racially diverse MSM

HPTN 061 TYPES OF FEMALE PARTNERS, & STIS OF BLACK MSMW

- Of 1,553 eligible study participants 561 (36 %) reported having sex with both a biological male and biological female partner in the previous six months (i.e., MSMW).
- The median age was 44 years (IQR: 34–49); nearly all (95 %) were born in the U.S. Only 24 % were currently employed, 14 % were full-time or part-time students, and 42 % had annual household incomes of less than \$10,000.

HPTN 061: SOCIODEMOGRAPHICS AND BASELINE HIV/STI DIAGNOSIS, BY MSMW'S FEMALE PARTNERSHIP PROFILE

AIDS Behav (2014) 18:1548–1559

	Total (n = 555)	Primary only (PF only)	Primary & non-primary (PF & NPF)	Non-primary only (NPF only) (n =	Test statistic	p value ^a (Chi-square / t
Recruitment method						
Community recruited	491/555 (88.5 %)	88.5 %	86.6 %	90.1 %	1.249	0.536
Referred	64/555 (11.5 %)	11.5	13.4	9.9		
Age at enrollment					11.252	0.024
18–30	116/555 (20.9 %)	20.5 %	14.0 %	27.2 %		
31–44	186/555 (33.5 %)	31.4	36.6	32.4		
≥45	253/555 (45.6 %)	48.1	49.5	40.4		
Median	44	44	44	42	7.349	0.025
HIV status at enrollment					0.255	0.279
HIV positive	466/545 (85.5 %)	88.1 %	86.8 %	82.5 %		
HIV negative	79/545 (14.5 %)	11.9	13.2	17.5		
Syphilis diagnosis ^{a,b}					\0.001	0.333
Not infected	518/546 (94.9 %)	92.1 %	96.7 %	95.3 %		
New active infection	12/546 (2.2 %)	3.3	1.6	1.9		
Treated infection	14/546 (2.6 %)	4.6	1.6	1.9		
Genital gonorrhea & chlamydia infection by urine NAAT ^a					0.009	0.140
Positive for either or both infections	14/548 (2.6 %)	4.5 %	1.1 %	2.4 %		
Negative for both infections	534/548 (97.4 %)	95.5	98.9	97.6		

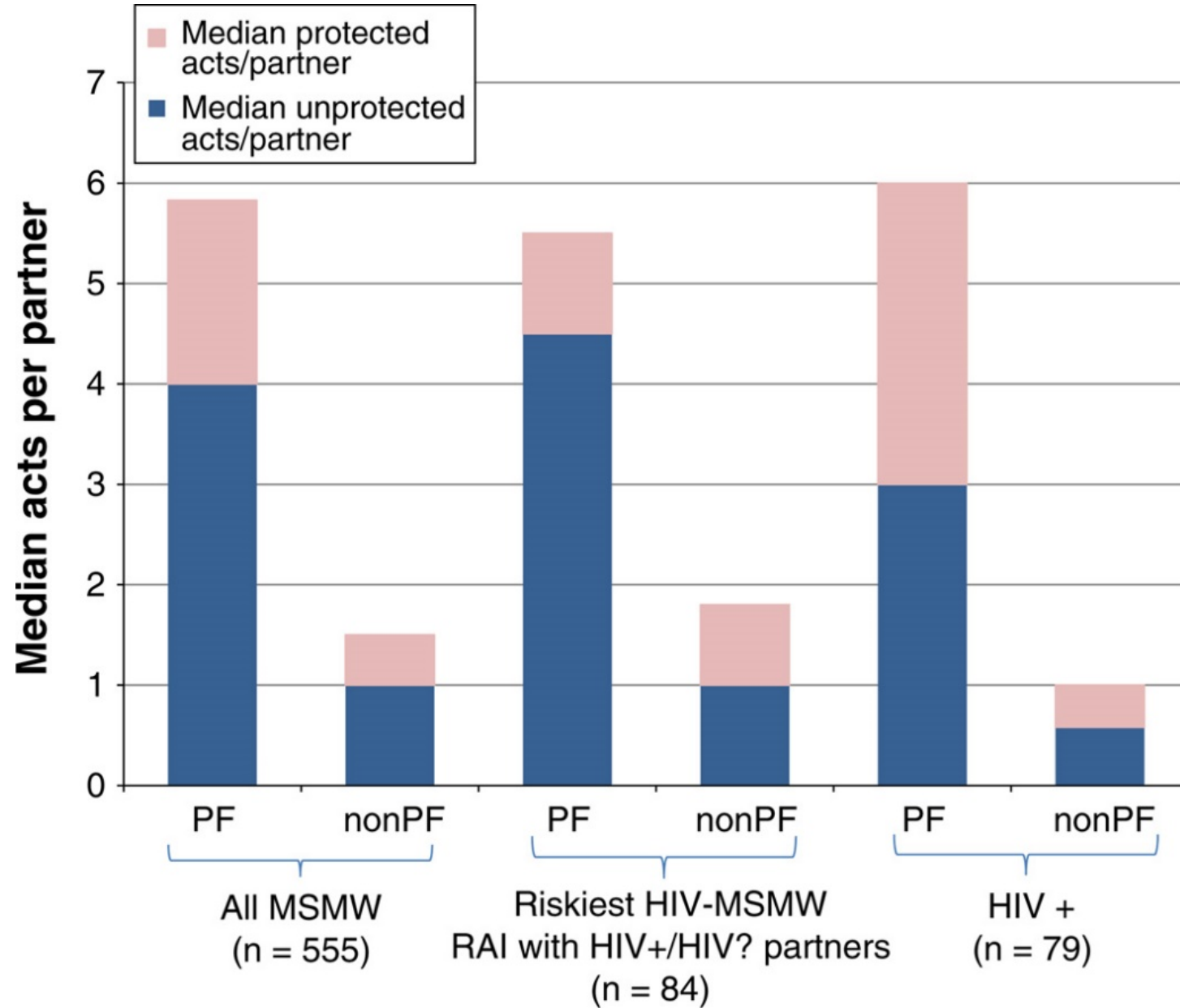
HPTN 061: SUMMARY OF STIS AMONG MSMW

- No statistically significant differences across the groups in syphilis infection or in the diagnosis of either CT or GC at a genital or rectal site; nor statistically significant group differences in the overall prevalence of CT or GC.

DO NETWORKS DRIVE STIS AMONG BLACK MSMW?

- In HPTN 061 other sexual network characteristics, such as sexual network size or density, NOT identified as significant predictors of prevalent STIs among this cohort of Black MSM. While previous studies have identified these sexual network factors as potential explanations for the disparity in HIV infection among Black MSM compared with other MSM, they were not significant predictors of prevalent STIs among this large cohort of Black MSM [[2](#), [12](#), [15](#), [18](#), [34](#)].

Median sex acts per female partner, by partner type (*PF* primary, *nonPF* non-primary female partner)



THE BRIDGING OF SEXUAL BOUNDARIES BY MEN WHO HAVE SEX WITH MEN AND WOMEN IN A STREET BASED SAMPLE IN LOS ANGELES

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SEXUAL ACQUISITION AND TRANSMISSION OF HIV
COOPERATIVE AGREEMENT PROGRAM (SATHCAP)



OBJECTIVES

- To assess the potential contribution of bisexual men to the spread of HIV in Los Angeles from MSM and drug users to the population with no behavioral risks.
- To assess differences in sexual positioning choices and the effect of HIV status of the individual and the partner for MSM and MSMW with male partners .

METHODS:

- 1125 males who participated in one of the two waves of data collection from 2005-2007 at the Los Angeles site for NIDA's Sexual Acquisition and Transmission of HIV – Cooperative Agreement Program (SATH-CAP) were recruited using Respondent Driven Sampling.
- ACASI was used to collect behavioral data; oral HIV rapid testing with (confirmatory blood test by Western Blot) was conducted and urine samples were analyzed for metabolites of cocaine, methamphetamine, heroin.
- MSM, MSW, or MSMW were defined by the gender of whom they reported sex with in the past 6 months.
- Chi-square tests and ANOVAs were used to test independence between these groups and demographic characteristics, substance use, and sexual behaviors.
- Generalized linear random intercept models included a partner-level predictor with 4 partner groups: MSM, MSMW- male partners, MSMW-female partners, and MSW.

RESULTS: GENERAL CHARACTERISTICS

- Men were mostly low income, unemployed, minority, with many being homeless;
- 66% had been to jail or prison
- 29% had ever injected drugs
- 25% had used methamphetamine in the past 30 days (more MSM)
- 2x more MSMW & MSW were Black than MSM (66% vs 34%); more MSM than MSMW or MSW were Hispanic (35% vs 14% & 12%)
- HIV prevalence: 12% for MSMW, **65% for MSM**, and 4% for MSW
- More mean # partners in past 6 moths reported by MSMW than MSM or MSW (10.0 vs 7.7 or 3.4)
- More MSMW reported sex for trade (both receiving and giving) and more MSMW had partners who are drug users than MSW.

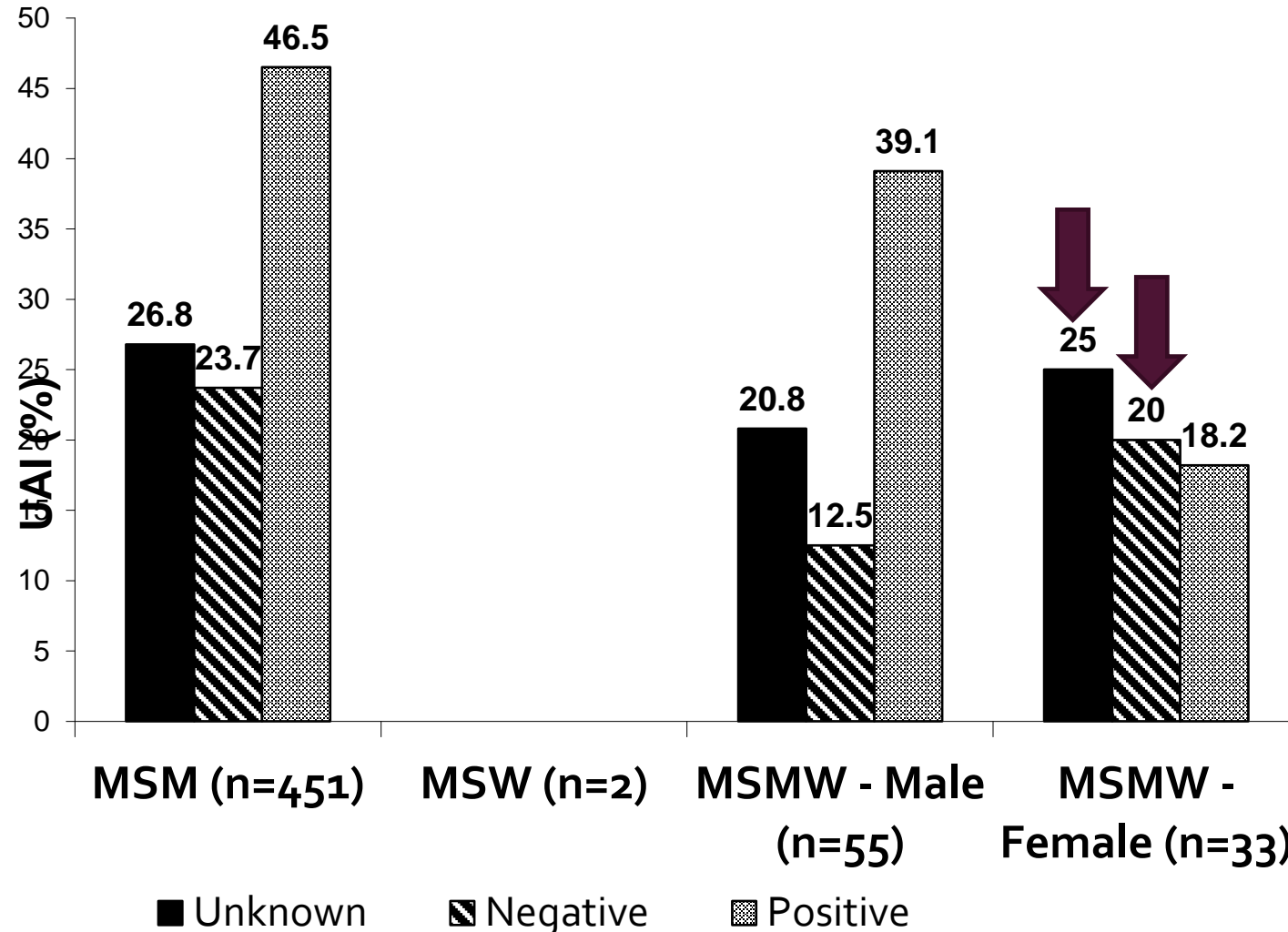
Drug Use of Participants: Positive Lab Test - past 3 days

	Total (N=1125) %	MSM (N=431) %	MSW (N=233) %	MSMW (N=461) %
Amphetamine /Meth	6.3	10.8	4.4	3.1
Cocaine	19.5	13.2	30.0	20.2
Opiate/Heroin	6.1	5.5	11.9	3.8

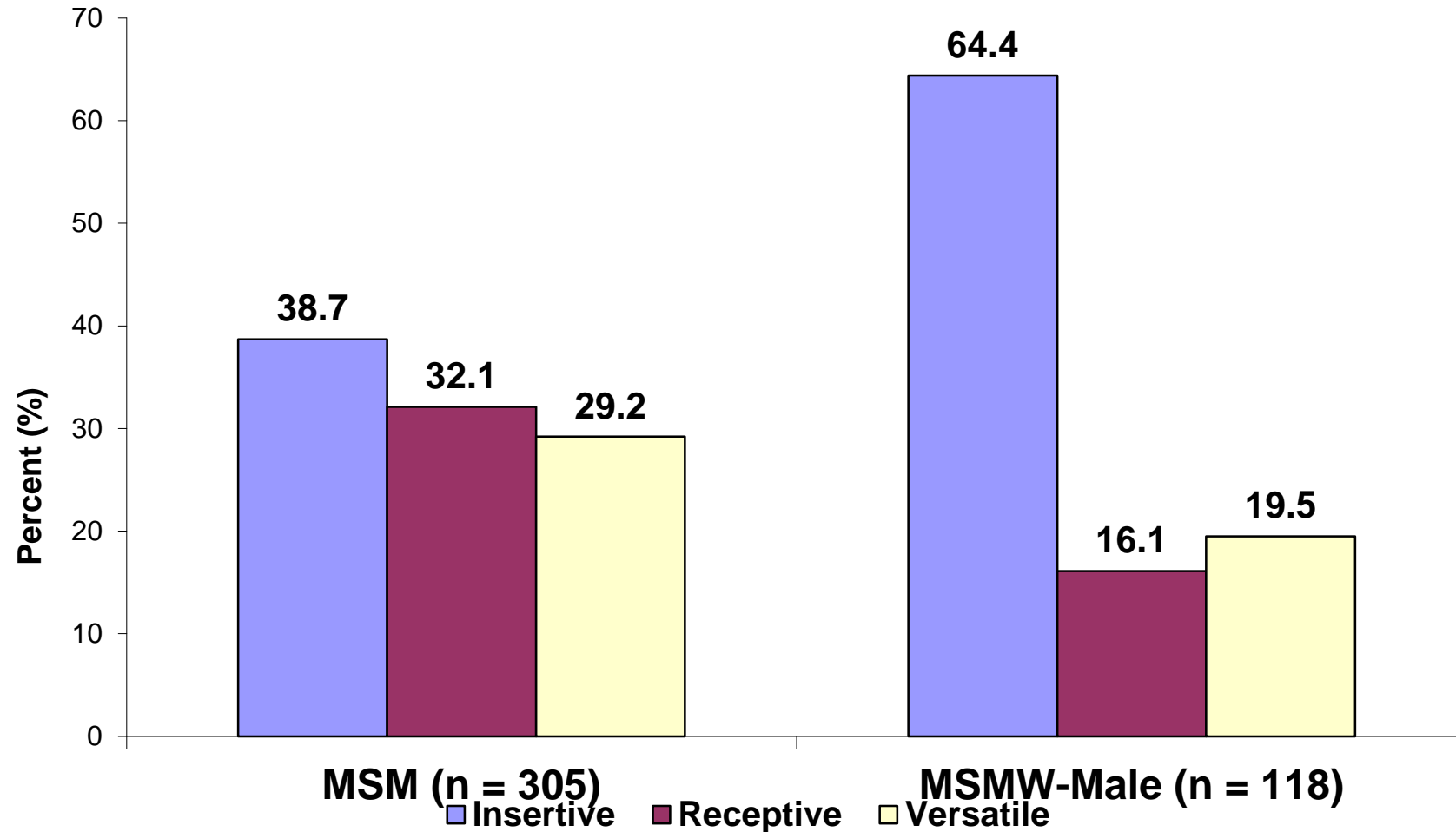
PARTNER CHARACTERISTICS

	Total (N=2092) %	MSM (N=806) %	MSW (N=441) %	MSMW – Male Partners (N=349)%	MSMW - Female Partners (N=496) %
Partner Race					
Black	48.4	38.9	57.8	52.1	52.3
White	26.0	27.7	26.9	23.5	24.3
Hispanic	18.6	26.1	11.1	17.9	14.0
Others	7.0	7.3	4.2	6.5	9.4
Main/Primary Partner	28.2	25.7	36.3	19.4	30.9
Partner Lives in the Same Neighborhood	46.1	37.9	64.4	43.9	49.7
Partner Ever Injected Drugs	25.9	22.8	21.8	32.7	29.6
Gave/Received Drugs/Money for Sex	32.5	23.1	32.3	39.1	43.3
Participant Received Drugs/Money for Sex	24.5	18.3	17.4	34.3	34.0

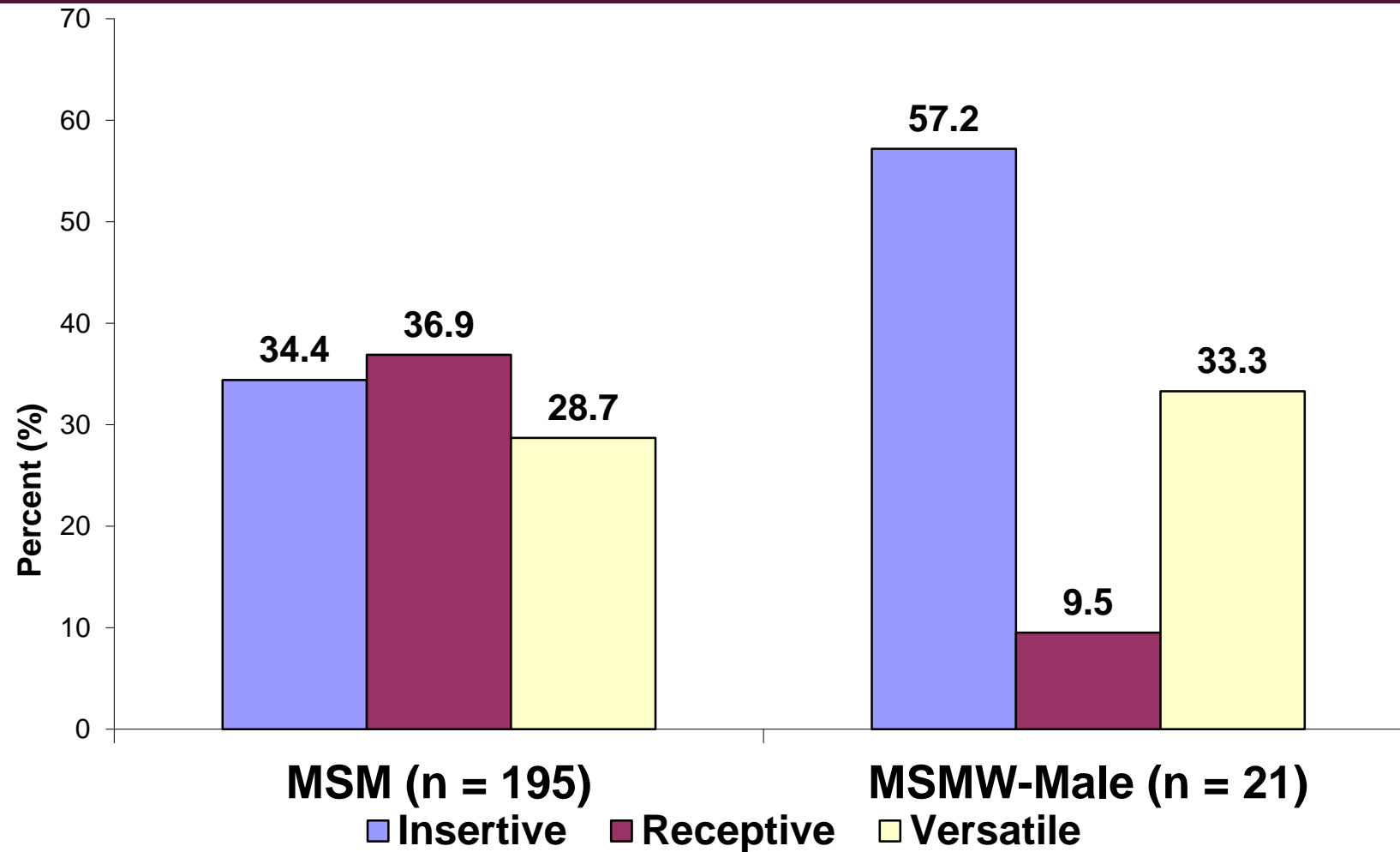
Unprotected Anal Intercourse by HIV Status of Partner: among HIV+ Males



Sexual position during AI with 1-3 recent partners: MSM and MSMW-male (n=548)



Sexual position with 1-3 recent partners among HIV+: MSM and MSMW-Male

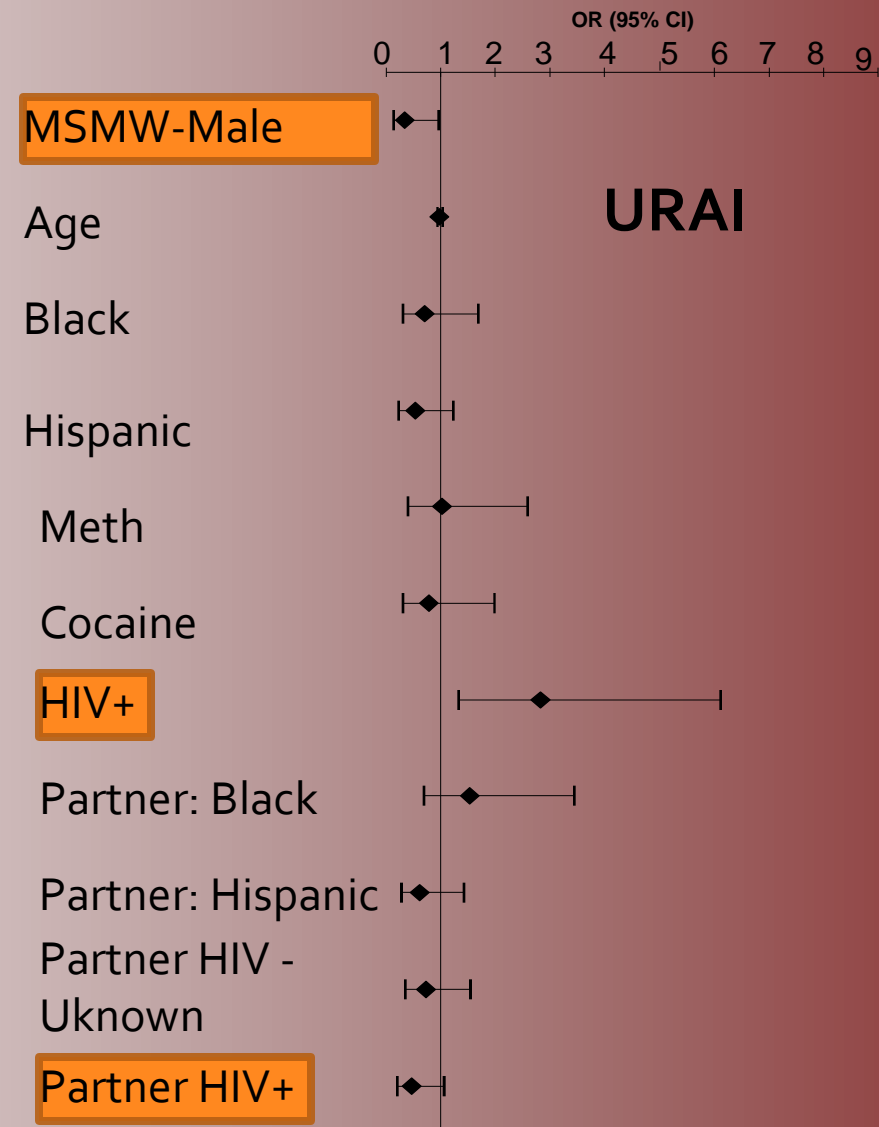
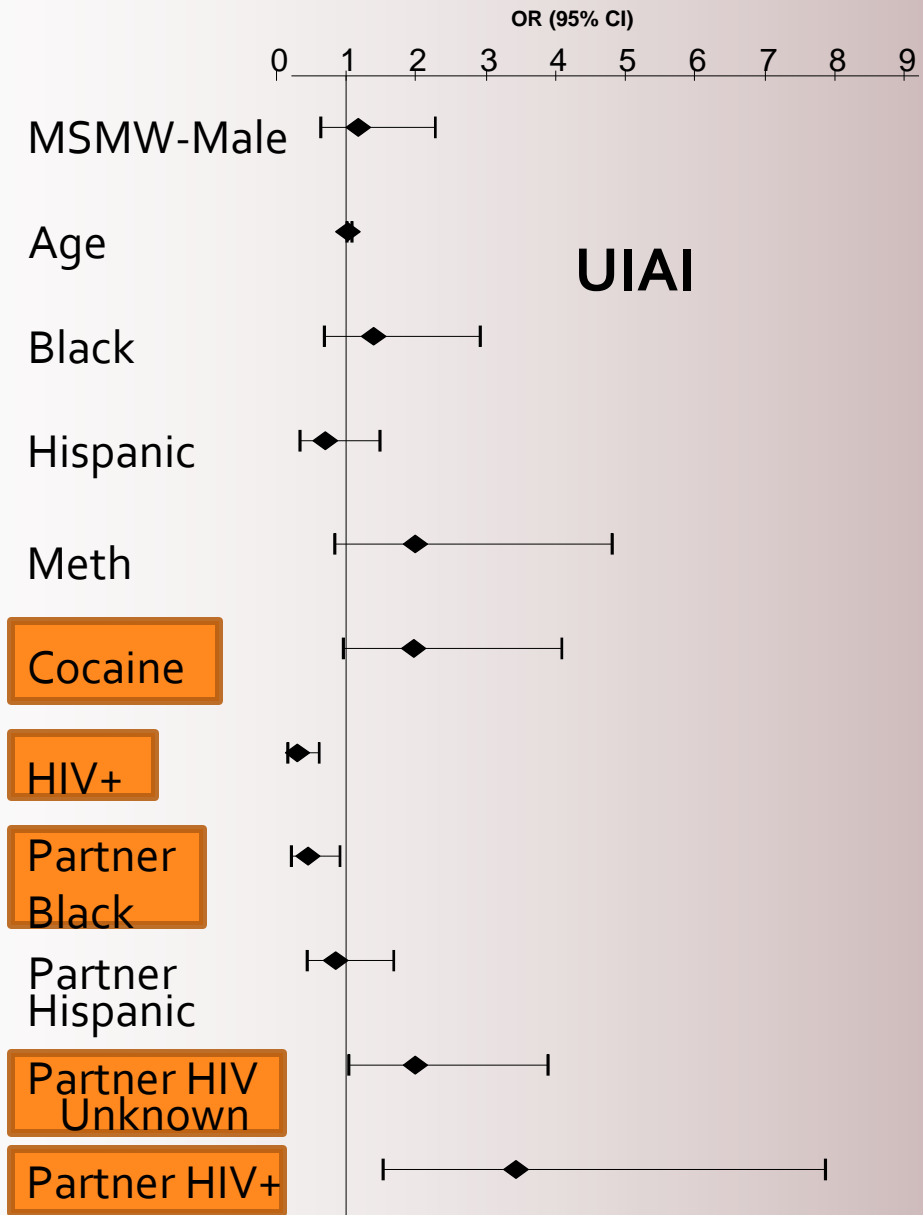


MSM AND MSMW-M:TOTAL (N=948)

	Total	MSM (N=681) ^{1,2}	MSMW- Male (N=267) ^{1,2}
Partner Race			
White	25.4	26.6	22.6
Black	43.5	39.8	52.6
Hispanic	24.1	26.3	18.8
Other	7.0	7.3	6.0
Give Drugs/Money for Sex	17.0	14.6	23.3
Receive Drugs/Money for Sex	21.6	17.3	32.7
Partner Ever Been to Jail	45.0	41.2	54.3
Unprotected Sexual Position (oral excluded)			
Unprotected Insertive	24.1	21.4	32.7
Unprotected Receptive	15.2	18.2	5.3
Unprotected Versatile	10.8	11.2	9.3



Multivariable analysis of Position with Partners



*Both regressions controlled for partner type and exchange drugs/money for sex

CONCLUSIONS:

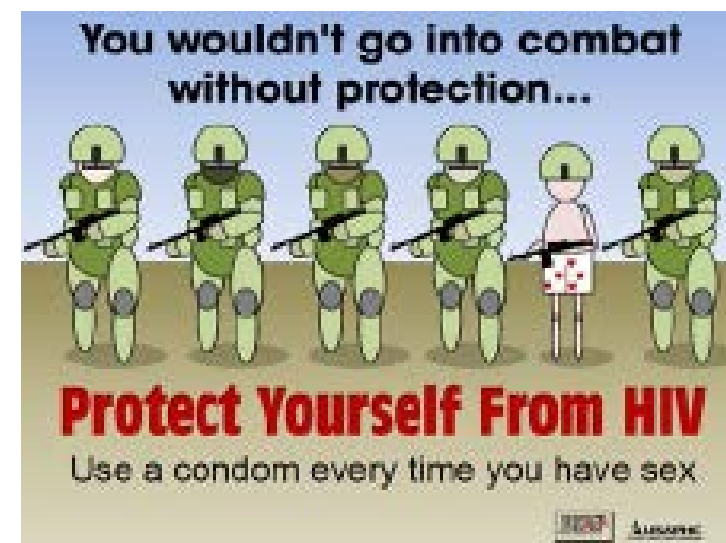
- While in general the HIV prevalence of the MSMW in our sample was significantly lower than MSM, the MSMW that are HIV positive practiced behaviors with significant transmission risk
- Findings highlight the interconnectedness of sexual and drug networks in this sample of men – as most have partners who use drugs and they use drugs themselves.
- We find a concentration of risk occurring – where many men use drugs, trade sex, and have sex with either gender.
- Findings also suggest an embedded core group of drug-using MSMW who may not so much contribute to spreading the HIV epidemic to the general population, but driven by their pressing need for drugs and money, concentrate the epidemic among men and women like themselves who have few resources.

CONCLUSIONS: POSITIONING

- We found differences in sexual position between MSM and MSMW with their male partners; with MSMW-m reporting insertive anal intercourse or only oral sex.
- However, when HIV status and partners HIV status are accounted for and if the AI is unprotected, this is reversed – men are more likely to have UIAI and less likely to have URAI with positive partners.
- Although more Black men report being insertive, not when HIV positive and if have HIV negative partners.
- Given the sampling scheme and demographics of the sample, more research is needed on position choices of MSM and MSMW-males to understand transmission risks

FUTURE EFFORTS: NEW BRIDGES TO WATCH?

- Injecting drug users -> non-injecting drug users
- MSM Drug users -> WSM drug users
- HIV negative -> HIV positive
- Older <-> younger
- PrEP users -> ??
- Service members <-> civilians
- Latinos



SUMMARY

- Assumptions that syphilis epidemics is driven by bridging from traditionally defined “high risk” to “low risk” groups needs revisiting – MSM-> ♀ not only risk pattern
- **No indication of high STIs among MSMW in recent literature**
- Latino men may be emerging as important
- Syphilis may be rising among HIV negatives – role of PrEP needs to be examined
- Don't forget partners and partnership!

