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Variations in patterns of sexual risk behavior among Seattle-area MSM based on their HIV status, the HIV status of their partner and partner type

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Abstract

We evaluated sexual risk behavior in 368 Seattle-area MSM recruited in the 2008 National HIV Behavioral Surveillance survey. We found significant concordance between participants' self-reported HIV status and that of their sexual partners. Persons unaware of partners' HIV status were more likely to report only oral sex. Those aware were less likely to report non-concordant unprotected anal intercourse (UAI). Participants reporting themselves HIV-positive were more likely than those self-reporting HIV-negative status to report non-concordant UAI and several other sexual risk behaviors. The level of non-concordant UAI did not materially differ by whether their partner was a main or casual partner.

Keywords

HIV; sexual risk behavior; MSM; risk behavior surveillance

Introduction

Male-to-male sexual contact is the most common transmission route for HIV in the United States. Taken together, men reporting sex with another man (MSM) and MSM also reporting injection drug use (MSM/IDU) accounted for an estimated 57% of newly-diagnosed HIV cases in 2008 in the 37 U.S. states with name-based reporting [1]. In King County, which includes Seattle, the proportion of MSM among newly-reported cases is even higher, with MSM and MSM/IDU together accounting for 82% of cases diagnosed and reported with a known exposure category 2007 through 2009 [2].

Monitoring sexual practices of MSM that affect the likelihood of HIV transmission can offer useful information for efforts to control the epidemic. Behavioral surveillance can offer guidance on what efforts MSM are undertaking to reduce transmission risk, where opportunities for risk reduction exist, and what subgroups among MSM are at particular risk for transmission. Behavioral surveillance can also help evaluate the success of prevention efforts. Understanding how knowing the results of HIV testing affects sexual risk behavior and understanding how sexual risk and risk reduction practices differ in sexual contacts with main and casual partners can help inform HIV counseling and public education efforts.

Since 2004, the CDC-sponsored National HIV/AIDS Behavioral Surveillance (NHBS) system has been surveying MSM, injection drug users (IDU) and persons at elevated risk for heterosexual HIV transmission in successive cycles [3]. In 2008, NHBS surveyed MSM in

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21 U.S. metropolitan areas, including Seattle (NHBS-MSM2). This report evaluates the patterns of sexual risk behaviors among participants in the Seattle area NHBS-MSM2 survey and how they vary as a function of participants' knowledge of their own HIV status, the HIV status of their partner and their relationship with their partner.

Methods

Study design and recruitment

The NHBS-MSM2 survey used venue-day-time recruitment methods [4]. Formative assessment was conducted to identify a collection of appropriate recruitment venues. For efficiency, only venues were considered where 75% of men attending were MSM. A CDC-developed computer program was used to randomly select venues, dates and times for recruitment events each month out of a listing of all potential recruitment possibilities. At each recruitment event, NHBS staff systematically intercepted venue attendees. In order to avoid duplicate interviews, potential participants were first asked preliminary questions about previous participation in the NHBS-MSM2 survey. Those not previously surveyed were then administered an eligibility screener and, if eligible, invited to participate in the study. Study eligibility required that participants be male, 18 years of age or older, resident in King or neighboring Snohomish County and able to complete the survey in English. After obtaining informed consent, trained interviewers administered a face-to-face, 30–40 minute survey using a hand-held computer.

Participants provided separate consent for HIV counseling and testing. Serologic HIV status was determined by a rapid test on oral fluid (OraSure Technologies, Bethlehem PA), followed by an oral fluid specimen for confirmatory testing by Western Blot (OraSure Technologies, Bethlehem PA) for those with reactive rapid tests. For purpose of this analysis we considered participants with a positive result on the rapid test but lacking a definitive result on the confirmatory test to be HIV-positive. Participants were paid $25 for the interview and $25 for the HIV test. Study procedures were reviewed and approved by the Washington State Institutional Review Board.

Analysis variables

Our analyses are restricted to participants who reported male-to-male sex in the previous 12 months (n=368). Also, analyses evaluating sexual behavior in terms of participants' self-reported HIV status excluded six participants who were initially diagnosed within the 12 months previous to the survey in order to restrict the analyses to persons who believed they were of a single HIV status during the entire 12-month referent period. Seven participants lacked all data of the details of their last sexual contact. The numbers included in individual analyses vary according to the number of substantive responses recorded to the relevant questions.

The study questionnaire elicited information on participants' sociodemographic characteristics, health history, HIV status, HIV testing history, and sexual and drug-using behaviors. As a summary measure of sexual risk behavior we used unprotected anal intercourse with a male partner of opposite or unknown HIV status (non-concordant UAI) in the previous 12 months. This variable combines information about participants' self-reported HIV status with responses to a question in a local supplement to the core NHBS questionnaire: "In the previous 12 months, did you have anal sex without a condom with a man who was HIV-positive?", along with analogous questions about HIV-negative partners and partners of unknown HIV status. No information was collected on how participants determined their partners' HIV status. Participants who reported not knowing their own HIV status would necessarily be classified as having practiced non-concordant UAI if they

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reported any UAI in the previous year. A variable for UAI with a partner of opposite HIV status was constructed using the same questionnaire items. This variable could be scored only for participants who self-reported being either HIV-positive or HIV-negative.

Other sexual risk measures were derived from a battery of questions detailing participants' last male-to-male sexual contact, providing information on non-concordant UAI and drug use at last sexual contact. We categorized the type of partner at last sexual contact into main partners and casual partners. Participants who reported 'oral or anal sex' at last sexual contact with another man but reported no anal sex were judged to have practiced oral sex only. Participants were also asked: "During the past 12 months when you were having sex with this [i.e. your last male] partner, did you have sex with other people?" This provides a measure of concurrent sexual partnerships, though it addresses only certain aspects of concurrency. Ten participants reported that their last sexual contact was with a female and for these participants our analyses are based on their last sexual contact with a male rather than their last chronologic contact.

Statistical analyses

Univariate associations were evaluated by Pearson chi-squared statistics. Stratified analyses were used to control for potential confounding in concordance in HIV status between participants and their last sexual partner. Mantel-Haenszel tests for the significance of a common odds ratio across strata and a Breslow-Day test for homogeneity of the odds ratio across strata were used to evaluate the stratified analyses; these statistics were necessarily derived from stratifications restricted to participants and their partners who were reported to be HIV-positive or HIV-negative. Logistic regression was used to control the association of self-reported HIV status with non-concordant UAI for potential confounding by sociodemographic characteristics. Age and foreign birth were found to be significantly associated with non-concordant UAI in logistic regression models. They were thus included in the logistic regression model evaluating the association of non-concordant UAI with self-reported HIV status and in models evaluating race, education, income and sexual orientation as potential confounders. Statistical significance was evaluated by likelihood ratio tests.

Results

Recruitment

In total, NHBS staff approached 1602 men during 79 recruitment events at 34 different venues between August and December, 2008. Of these, 1028 (64%) accepted being asked the preliminary questions on previous participation in the survey. Eighty-two reported having already been surveyed, 516 declined further participation in the survey, and 430 men agreed to accept a more detailed eligibility screening. Thirteen men were then found to be ineligible for the survey because they were not King or Snohomish County residents, three because they did not identify themselves as male, two more due to having previously been surveyed, and one because of incapacitation. All 411 participants eligible after these exclusions consented to the interview. In addition, 42 participants were excluded from the present analysis because they reported no male sex partners in the previous 12 months and 1 due to incomplete interview data, yielding 368 participants (23% of the total number initially approached). The highest number of participants were recruited at bars (43%), followed by social organizations (19%) and dance clubs (19%).

Sociodemographics

The mean age of participants was 35 (Table 1), somewhat older than the mean age of MSM seen in the Seattle STD Clinic (33 years old) [5], and close to the mean age of newly diagnosed MSM cases reported to the HIV/AIDS Reporting System (35 years old).

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Participants were predominantly White (63%), with a representation of Blacks (6%) close to that estimated for King County as a whole (5%) [6]. Hispanics constituted a slightly higher proportion of the study population (10%) than their estimated proportion of the 2005–2009 King County population (8%). There was a somewhat lower proportion of Asians in the NHBS-MSM2 population than in the population estimates for King County (8% vs. 12%). As in the Seattle area NHBS surveys of IDU and persons at risk for heterosexually transmitted HIV, there were more persons reporting multiple races than seen in census-based data (11% vs. 2%). Among the 11% of participants reporting foreign birth, by far the largest proportion (43%) were of Asian ancestry. While 10% of participants reported bisexual orientation, none reported heterosexual orientation.

HIV status and testing

Fifty-eight of the 359 participants with HIV serologic results tested positive for HIV (16%) (Table 2). Nine participants lacked serologic HIV results: 7 refused testing, 1 had an indeterminate result and the results were lost for 1. Among the 58 participants who tested HIV-positive, 50 (86%) were aware of their status. Of the 8 serologically HIV-positive participants unaware of their status, four reported that their most recent HIV-negative test was within the previous 12 months. Self-reported HIV status was strongly predictive of serologic status: 273 of the 279 participants (98%) who self-reported being HIV-negative were negative by serology. All those who self-reported being HIV-positive were serologically positive.

Sixty-one percent (192/315) of the participants who did not self-report being previously diagnosed with HIV reported an HIV test in the previous year; only 7% had never tested (Table 3). Among 53 participants previously diagnosed with HIV (including 3 who declined our serologic testing), 11% (6/53) had been diagnosed in the previous 12 months and 45% (24/53) more than 10 years before the survey. Sixty-seven percent of the self-reported HIV-positive participants were currently taking anti-retroviral medication. No information was collected on participants' viral loads.

Sexual behavior and knowledge of partners' HIV status

Sixty-nine percent (254/368) of participants reported knowing the status of their partner at last male sexual contact (Table 4). Sexual behavior at last sexual contact differed significantly for participants who did and did not know the HIV status of their partner (χ^2 = 66.30, P<0.001). Participants who did not know the HIV status of their partner were more likely than those who did to report having practiced oral sex only (41% vs. 26%) (χ^2 = 9.09, P=0.003). While, by definition, none of the participants unaware of their partner's HIV status could have practiced concordant UAI, fully 38% of those knowing their partner's status reported concordant UAI. Those knowing their partner's status were significantly less likely to have practiced non-concordant UAI (8% vs. 23%) (χ^2 = 17.22, P<0.001).

Concordance in HIV-status with last sexual partner

There was a significant association between participants' self-reported HIV status and the HIV status they reported for their partner at last sexual contact (χ^2 = 101.24, P<0.001) (Table 5). HIV-positive participants were much more likely to report that their last partner was HIV-positive (51%) than HIV-negative participants (6%). HIV-negative participants were much more likely to report an HIV-negative last partner than HIV-positive participants (64% vs. 26%).

The concordance between participants' self-reported HIV status and that of their last sexual partner could be a result of participants selecting sexual partners on the basis of other factors than their HIV status, if those other factors were associated with HIV infection. We found

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four variables independently associated with HIV-seropositivity with a p-value less than or equal to 0.05 when included together in a logistic regression model: age, education, ever-injection, and amphetamine use in the previous 12 months (data not shown).

We analyzed the relationship between participant's self-reported HIV status and the perceived status of their last partner stratified by participants' age (Table 6). Among participants 18–29 years old, HIV-positive participants were more likely to report an HIV-positive last partner (44%) than an HIV-negative participant (4%). HIV-negative participants were more likely to report an HIV-negative partner (73%) than HIV-positive participants (44%). Were participants selecting partners on the basis of age rather than HIV status, it would be expected that HIV-positive and HIV-negative participants would report an HIV-positive partner with the same frequency. The same disproportionate tendency of participants to report a last partner of the same HIV status as themselves was seen in each category of participant age. This argues that concordance between participant's HIV-status and that of their last partner was not simply a product of participants having sexual partners of an age similar as themselves. Analogous analyses, stratified by education, injection history and amphetamine use (data not shown) produced similar patterns of disproportionate concordance in HIV status among sex partners in every category of these variables ($P_{(\text{common odds ratio})} < 0.001$ and $0.28 \leq P_{(\text{homogeneity across strata})} \leq 0.96$, in each analysis).

Sexual risk behavior as a function of participants' self-reported HIV status

Non-concordant UAI in the previous 12 months was reported by 27% of self-reported HIV-negative and 41% of HIV-positive participants ($\chi^2 = 3.72$, P=0.05) (Table 7). Among HIV-negative participants, 8% reported UAI with a male partner of <u>opposite</u> (positive) HIV status in the previous 12 months, while 28% of the HIV-positive participants reported UAI with an HIV-negative partner ($\chi^2 = 16.37$, P<0.001). At last sexual contact, 9% of HIV-negative participants reported non-concordant UAI, compared to 17% of HIV-positive participants ($\chi^2 = 2.71$, P=0.10).

HIV-positive participants were also more likely than HIV-negatives to report: diagnosis with a sexually transmitted disease in the previous 12 months (STD) (15% vs. 7%) ($\chi^2 = 3.72$, P=0.05), concurrent sexual partnerships (62% vs. 43%)($\chi^2 = 5.24$, P=0.02), drug use at last sexual contact (28% vs. 15%)($\chi^2 = 4.85$, P=0.03). They were also more likely to report having 10 or more sexual partners in the previous 12 months, though this result could well be a product of chance (34% vs. 26%) ($\chi^2 = 1.18$, P=0.28). On the other hand, HIV-positive participants were more likely than HIV-negative participants to report discussing their HIV status and their partners HIV status prior to first sexual contact with all male anal sex partners in the previous 12 months (60% vs. 38%) ($\chi^2 = 6.31$, P=0.01).

Among HIV-positive participants 65% responded yes to the question: "In the past 12 months, did you ever decide to have sex without a condom with someone specifically because you knew that you both had the same HIV status?" The corresponding figure among HIV-negatives was 45% ($\chi^2 = 6.56$, P=0.01).

Multivariate analyses of non-concordant UAI

We used logistic regression to evaluate the association of self-reported HIV status with non-concordant UAI in the past 12 months after control for socio-demographic characteristics. The likelihood of reporting any non-concordant UAI in the previous 12 months varied significantly with participants' age (P=0.01) (Table 8). Even though only 11% of participants reported foreign birth, their lower rate of non-concordant UAI (11%) attained statistical significance (odds ratio=0.23) (P=0.001). Non-concordant UAI was not associated with race (P=0.47), education (P=0.92), income (P=0.17) or sexual orientation (P=0.87).

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After control for age and foreign birth, participants' self-reported HIV status remained significantly associated with non-concordant UAI in the previous 12 months (P=0.01). HIV-positive participants and participants unaware of their HIV status were both about twice as likely to report non-concordant UAI as HIV-negative participants.

Protective positioning

At last sexual contact, all but 45 (12%) of participants reported using a condom, practicing oral sex only or unprotected anal sex with a person they believed to be of the same HIV status as themselves (Table 9). Among the 45 participants not reporting one of these potential risk reduction practices, 33 (73%) reported unprotected anal sex in a configuration that did not constitute protective positioning for persons of their HIV status (insertive for positives, receptive for negatives) and 12 (27%) reported unprotected anal sex only in a protective position.

Sexual risk behavior with main and casual partners

Participants reporting that their last sexual contact was with a main partner were more likely to report knowing the HIV status of the partner (93%) than those reporting a casual partner (55%) (χ^2 =56.01, P<0.001) (Table 10). Sexual behavior differed by whether the last partner was main or casual (χ^2 = 45.78, P<0.001). Participants reporting a main last partner were more likely to report concordant UAI. Participants reporting a casual last partner were more likely to report practicing oral sex only or protected anal sex. The likelihood of non-concordant UAI at last sexual contact was similar for those with main (14%) and casual (12%) partners.

Study limitations

Study eligibility was restricted to men who reported a male sex partner in the last year, so that our findings exclude MSM who were not currently sexually active. Because bars and other venues where sexual partners are sought were the most common places of study recruitment, our study population is likely to have overrepresented MSM practicing higher levels of sexual activity. The monetary incentives offered could have made the survey more attractive to less affluent MSM. As only a fraction of those approached completed an interview, we cannot state with assurance that our sample fully reflected the population attending the study venues, let alone Seattle-area MSM in general. Because no data were obtained on viral load, we were unable to evaluate its possible associations with sexual risk behavior, though there is evidence from a meta-analysis that viral load was not associated with UAI among HIV-positive MSM (5). As no data were available on withdrawal before ejaculation, we could not evaluate this potential risk reduction practice in our study population. Behavioral data were necessarily elicited by self-report and are subject to social desirability bias. However, if strictures against transmitting HIV led HIV-positive participants to preferentially under-report sexual risk behavior, the differentials in non-concordant UAI between HIV-positive and HIV-negative participants we observed would have underestimated the true difference.

Discussion

We found that patterns of sexual risk behavior in our study population varied substantially depending on participant's knowledge of their HIV status, the HIV status of their partner and their relationship with their partner. The level and frequency of HIV testing was high enough in the study population to permit risk reduction practices dependent on knowledge of participants' and their partners' HIV status. Participants unaware of their partner's status were more likely to report oral sex only, which in this context may be a reasonable way to

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attempt to reduce HIV transmission risk. But they were also more likely to report non-concordant UAI.

The disproportionate tendency of participants to report a last partner with concordant HIV status implies that a substantial degree of serosorting is occurring in our study population. This does not appear to be a product of confounding by age, education, injection history or amphetamine use. We saw no evidence that participants not using condoms or practicing concordant UAI were adopting protective positioning, though the number of participants with informative data was small and our ability to detect such behavior limited.

The pattern of sexual risk behavior with main and casual partners varied. Participants reporting that their last partner was a casual partner were more likely to report oral sex only and condom use. Those reporting that their last partner was a main partner were more likely to report unprotected sex with a person of the same HIV status as themselves. The net effect was that the level of non-concordant UAI was similar in the two groups.

Nonetheless, substantial levels of sexual risk behavior were reported. Overall, 31% of participants reported non-concordant UAI in the previous year. This figure is close to the 29% figure that can be calculated from a report on MSM attending the Seattle Public Health STD Clinic [5], but well above the 14% derived for participants in a Seattle area random digit dial survey of MSM [7].

We found that participants in the 2008 Seattle-area NHBS-MSM2 survey who reported being HIV-positive were substantially more likely to report non-concordant UAI than those who reported being HIV-negative. This was found despite the observation that HIV-positive participants were more likely than HIV-negatives to report discussing their HIV status with sexual partners and to report intentionally practicing concordant UAI. Our finding that 41% of HIV-positive participants reported non-concordant UAI was higher than the summary value of 26% found in a meta-analysis based on 30 U.S. studies [8]. This difference is probably not the result of the relatively long 12-month recall period in our study (vs. the 3-month median recall period in the meta-analysis) as the meta-analysis reported that the rate was not sensitive to the recall period. The higher level of non-concordant UAI among HIV-positive participants does not appear to be the result of differences between HIV-positive and negative participants in age, race, nativity, education, income or sexual orientation. Other studies in the Seattle area [5;7], and in California [9], the United Kingdom [10;11], and Australia [12], have also reported higher rates of non-concordant UAI among MSM reporting themselves to be HIV-positive than those self-reporting HIV-negative status.

Several other measures of sexual risk behavior were also reported more frequently by HIV-positive participants. Though some (non-concordant UAI at last sexual contact, 10 or more partners in the previous 12 months) did not attain statistical significance, the consistency with which HIV-positive participants reported higher levels of sexual risk behavior is concerning.

These data highlight a continuing need to develop and implement effective behavioral interventions for HIV-positive MSM, but they also raise a note of caution as to what such measures can be expected to achieve, given widespread awareness of the importance among Seattle area care providers of reducing sexual risk behavior among HIV-positives. These findings underline the importance of implementing complementary efforts to reduce HIV transmission, such as the promotion of antiretroviral treatment among HIV-positives as a means of reducing the likelihood of viral transmission.

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Table 1

Sociodemographic characteristics and sexual orientation of participants in the Seattle area 2008 NHBS-MSM2 survey

	N	%
Age		
18 – 29	147	40%
30 – 39	111	30%
40 – 49	68	19%
50 +	42	11%
Mean age (years)		(35)
Race/ethnicity		
White	233	63%
Black	21	6%
Hispanic	35	10%
Asian	30	8%
Native American	4	1%
Other race	5	1%
Multiple races	40	11%
Foreign birth	42	11%
Education		
≤H.S. graduate	75	20%
Some post-H.S.	147	40%
College graduate	146	40%
Yearly income		
< $15,000	64	17%
$15,000 – $39,999	128	35%
$40,000 – $74,999	104	28%
$75,000 +	72	20%
Sexual orientation		
Homosexual	329	90%
Bisexual	38	10%
Heterosexual	0	
N (total)	368	-

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Table 2

Serologic and self-reported HIV status of participants in the 2008 Seattle area NHBS-MSM2 survey

	Serologic HIV status			
Self-reported HIV status	**Negative**		**Positive**	
	N	**%**	**N**	**%**
Negative	273	91%	6	10%
Positive	0	-	50	86%
Unknown	28	9%	2	3%
N (total = 359)	301	(84%)[a]	58	(16%)

[a]Row percentages.

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Table 3

Time since last HIV test among self-reported HIV negative participants in the 2008 Seattle area NHBS-MSM2 survey

Time since test	N	%
3 months	79	25%
4 – 6 months	52	17%
7 – 12 months	61	19%
13 – 24 months	52	17%
25 – 60 months	31	10%
> 60 months	17	5%
Never tested	23	7%
Total	315	-

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Table 4

Sexual behavior at last sexual contact and participants' report of the HIV status of their partner, among participants in the 2008 Seattle area NHBS-MSM2 survey

	Participant knew HIV status of partner					
	No		Yes		Totals	
Sexual behavior	N	%	N	%	N	%
Oral sex only	47	41%	65	26%	112	30%
Protected anal sex	41	36%	73	29%	114	31%
Concordant UAI	-[a]	-	97	38%	97	26%
Non-concordant UAI[b]	26	23%	19	8%	45	12%
Totals	114	(31%)[c]	254	(69%)	368	-

[a]Participants unaware of their partner's HIV status, by definition, could not practice concordant UAI.

[b]Unprotected (without a condom) anal intercourse with a partner of opposite or unknown HIV status.

[c]Row percentages

(χ^2 = 66.30, P<0.001)

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Table 5

Correspondence between participants' self-reported HIV status and the perceived HIV status of their partner at last male-to-male sexual contact, among participants in the 2008 Seattle area NHBS-MSM2 survey

Partner's HIV status	Participant's HIV status							
	Negative		Positive		Unknown		Totals	
	N	%	N	%	N	%	N	%
Negative	182	64%	14	26%	14	45%	210	57%
Positive	16	6%	27	51%	0	-	43	12%
Unknown	86	30%	12	23%	17	55%	115	31%
Totals	284	(77%)[a]	53	(14%)	31	(8%)	368	-

[a]Row percentages

(χ^2 = 101.24, P<0.001)

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Table 6

Concordance between participants self-reported HIV status and the perceived HIV status of their partner at last male-to-male sexual contact, stratified by participant's age, among participants in the 2008 Seattle area NHBS-MSM2 survey

Participants 18 – 29 years old						
	Participant's self-reported HIV status					
Partner's HIV status	**HIV-negative**		**HIV-positive**		**HIV-unknown**	
	N	*%*	*N*	*%*	*N*	*%*
HIV-negative	87	73%	4	44%	8	42%
HIV-positive	5	4%	4	44%	0	-
HIV-unknown	27	23%	1	11%	11	58%
Totals (n=147)	119		9		19	
Participants 30 – 39 years old						
	Participant's self-reported HIV status					
Partner's HIV status	HIV-negative		HIV-positive		HIV-unknown	
	N	*%*	*N*	*%*	*N*	*%*
HIV-negative	55	63%	5	31%	4	50%
HIV-positive	5	6%	7	44%	0	-
HIV-unknown	27	31%	4	25%	4	50%
Totals (n=111)	87		16		8	
Participants 40 – 49 years old						
	Participant's self-reported HIV status					
Partner's HIV status	HIV-negative		HIV-positive		HIV-unknown	
	N	*%*	*N*	*%*	*N*	*%*
HIV-negative	24	53%	3	16%	2	50%
HIV-positive	4	9%	13	68%	0	-
HIV-unknown	17	38%	3	16%	2	50%
Totals (n=68)	45		19		4	
Participants 50+ years old						
	Participant's self-reported HIV status					
Partner's HIV status	HIV-negative		HIV-positive		HIV unknown	

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Participants 18 – 29 years old						
	Participant's self-reported HIV status					
Partner's HIV status	**HIV-negative**		**HIV-positive**		**HIV-unknown**	
	N	*%*	*N*	*%*	*N*	*%*
HIV-negative	16	49%	2	22%	0	-
HIV-positive	2	6%	3	33%	0	-
HIV-unknown	15	46%	4	44%	0	-
Totals (n=43)	33		9		0	

$P_{(\text{common odds ratio})} < 0.001$; $P_{(\text{homogeneity across strata})} = 0.95$

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Table 7

Sexual risk behaviors by self-reported HIV status, among participants in the 2008 Seattle area NHBS-MSM2 survey

	Participants' self-reported HIV status						χ^2	P-value[a]
	HIV-Negative		HIV-Positive		Unknown Status			
Sexual behaviors	*%*	*n/N*	*%*	*n/N*	*%*	*n/N*		
In previous 12 months:								
Non-concordant UAI	27%	(74/271)	41%	(19/46)	48%	(15/31)	3.72[b]	0.05
UAI with a partner of opposite HIV status	8%	(20/264)	28%	(12/43)	-	-[c]	16.37	<0.001
STD	7%	(19/283)	15%	(7/47)	7%	(2/31)	3.72	0.05
10 or more sexual partners	26%	(75/284)	34%	(16/47)	26%	(8/31)	1.18	0.28
Discussed HIV status[d]	38%	(81/216)	60%	(22/37)	41%	(11/27)	6.31	0.01
Intentional concordant UAI[e]	45%	(121/270)	65%	(30/46)	23%	(7/31)	6.56	0.01
At last sexual contact:								
Non-concordant UAI	9%	(26/284)	17%	(8/47)	36%	(11/31)	2.71	0.10
Concurrent sex partners	43%	(117/272)	62%	(26/42)	50%	(14/28)	5.24	0.02
Drug use	15%	(40/272)	28%	(13/47)	14%	(4/28)	4.85	0.03

[a] p-values evaluate the significance for each behavior of the difference between self-reported HIV-positive and HIV-negative participants only, ignoring those unaware of their HIV status.

[b] All χ^2 statistics have one degree of freedom.

[c] Participants unaware of their own HIV status would necessarily not be able to be scored for UAI with a partner of opposite HIV status.

[d] Participants reporting that they "did discuss BOTH your (i.e. participant's) HIV status and their (i.e. partner's) status before you had sex for the first time" for every anal sex partner in the previous 12 months (among participants reporting anal sex).

[e] Based on responding 'yes' to the question: "In the past 12 months, did you ever decide to have sex without a condom with someone specifically because you knew that you both had the same HIV status?"

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Table 8

Logistic regression results for associations of any unprotected anal intercourse with a male partner of non-concordant HIV status in the previous 12 months, among participants in the 2008 Seattle area NHBS-MSM2 survey

	Non-concordant UAI		Odds Ratio[a]	95% Confidence Interval	P-value
	%	n/N			
Overall	31%	108/348			
Self-reported HIV status					
Negative	27%	74/271	1.00		0.01
Positive	41%	19/46	2.19	(1.08–4.44)	
Unknown	48%	15/31	2.52	(1.14–5.56)	
Age					
18 – 29	31%	43/139	1.00		0.01
30 – 39	41%	43/106	1.51	(0.86 – 2.63)	
40 – 49	21%	14/67	0.48	(0.23 – 1.00)	
50 +	22%	8/36	0.58	(0.24 – 1.41)	
Foreign birth					
No	33%	104/311	1.00		0.001
Yes	11%	4/37	0.23	(0.08 – 0.66)	

[a]In a model containing terms for self-reported HIV status, age, and foreign birth.

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Table 9

Protective positioning at last sexual contact, by self-reported HIV status, among participants in the Seattle area 2008 NHBS-MSM2 survey

	Participants' self-reported HIV status							
	Negative		Positive		Unknown		Totals	
	N	%	N	%	N	%	N	%
Non-concordant, UAI								
Any unprotective positioning	16	6%	6	13%	11	36%	33	9%
Protective positioning only	10	4%	2	4%	0[a]	-	12	3%
Concordant UAI	78	28%	17	36%	0	-	95	26%
Oral sex only or condom use	180	63%	22	47%	20	65%	222	61%
Totals	284		47		31		362	

[a]Participants unaware of their own HIV status, of necessity, would not be in position to practice protective positioning or concordant UAI.

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Table 10

Sexual behavior at last male-to-male sexual contact by type of partner, among participants in the Seattle area 2008 NHBS-MSM2 survey

	Type of last partner				χ^2	P-value
	Main		Casual			
	N	%	N	%		
Knowledge of partner's HIV status						
Knew partner's status	123	93%	125	55%	56.01	<0.001
Sexual behavior						
Oral sex only	27	20%	83	36%	45.78 (overall)	<0.001
Protected anal sex only	27	20%	85	37%		
Concordant UAI	61	46%	34	15%		
Non-concordant UAI	18	14%	27	12%		
N (total=362)	133	(37%)[a]	229	(63%)		

[a]Row percentage.