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A CAUTIONARY TALE: RISK REDUCTION STRATEGIES AMONG URBAN AMERICAN INDIAN/ALASKA NATIVE MEN WHO HAVE SEX WITH MEN

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American Indian and Alaska Native (AIAN) men who have sex with men (MSM) are considered particularly high risk for HIV transmission and acquisition. In a multi-site cross-sectional survey, 174 AIAN men reported having sex with a man in the past 12 months. We describe harm reduction strategies and sexual behavior by HIV serostatus and seroconcordant partnerships. About half (51.3%) of the respondents reported no anal sex or 100% condom use and 8% were in seroconcordant monogamous partnership. Of the 65 men who reported any sero-adaptive strategy (e.g., 100% seroconcordant partnership, strategic positioning or engaging in any strategy half or most of the time), only 35 (54.7%) disclosed their serostatus to their partners and 27 (41.5%) tested for HIV in the past 3 months. Public health messages directed towards AIAN MSM should continue to encourage risk reduction practices, including condom use and sero-adaptive behaviors. However, messages should emphasize the importance of HIV testing and HIV serostatus disclosure when relying solely on sero-adaptive practices.

HIV/AIDS is an increasing threat to the health and well-being of American Indians and Alaska Natives (AIAN) across the United States (U.S.). According to the National HIV/AIDS Surveillance System, through 2009 an estimated cumulative total of 3,700 AIDS cases among AIAN were reported to the CDC (Centers for Disease Control and Prevention, 2011a), with a 2009 estimated AIDS case rate of 6.6 per

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100,000 and estimated HIV incidence rate of 14 per 100,000 (Prejean et al., 2011), with the overall HIV diagnoses rate among AIAN increasing from 2006–2009 (Roubideaux, 2011).

AIAN men who have sex with men (MSM) are at particularly high risk for HIV transmission and acquisition (Fauci, 2010). HIV prevalence rates among urban AIAN MSM have ranged from 18–34%, rivaling prevalence rates for MSM in sub-Saharan African countries (12–44%) and in the African-American community (28%) (Cassels, Pearson, Walters, Simoni, & Morris, 2010; Catania et al., 2001; Centers for Disease Control and Prevention, 2010; UNAIDS & World Health Organization, 2009). This high prevalence has been partially attributed to a substantial amount of sexual risk-taking among AIAN MSM (Cassels et al., 2010) and the disproportionate exposure to HIV through injection drug use. Despite the vulnerability of AIAN MSM in the face of the HIV epidemic, there is not a single empirically supported HIV prevention intervention targeting them (Centers for Disease Control and Prevention, 2012).

Published reports on HIV risk behaviors among AIAN are scarce, (Bertolli et al., 2004; Burks, Robbins, & Durtschi, 2011; Cassels et al., 2010; Duran & Walters, 2004; Kaufman et al., 2007; Nelson, Simoni, Pearson, & Walters, 2011), though AIAN communities experience high levels of socio-structural risk factors and sexual risk behaviors associated with increased rates of HIV (Baldwin, Maxwell, Fenaughty, Trotter, & Stevens, 2000; Duran & Walters, 2004; Walters, Simoni, & Harris, 2000). Clearly, more information on sexual behavior in AIAN communities is needed to identify those most at risk, particularly MSM.

A recent area of inquiry explores community-driven prevention strategies, such as social change (i.e., legal reform, stigma reduction), group mobilization to reduce social vulnerability, and harm reduction or health-seeking behavior (Auerbach, Parkhurst, & Cáceres, 2012). Among MSM, harm reduction strategies include 100% condom use and sero-adaptive strategies. These strategies are used to reduce transmission rates in specific groups (Hart & Elford, 2010; Marks et al., 2010; McConnell, Bragg, Shiboski, & Grant, 2010; Snowden, Raymond, & McFarland, 2011; Wei et al., 2010). An examination of these strategies may lead to the identification of the most at-risk AIAN MSM and point to specific risk and protective factors in this population.

Community-driven interpretations of public health information often lead people to adopt behavioral prevention strategies either fully or partially or before those strategies are recognized and validated by health research (Golden, Stekler, Hughes, & Wood, 2008a; McConnell et al., 2010; Snowden, Raymond, & McFarland, 2009). Behavioral prevention strategies are based on weighing the risk of exposure in relation to particular sexual activities and adjusting one's behavior accordingly (Snowden et al., 2011). There are several sero-adaptive strategies. They include 1) serosorting: choosing a partner with the same serostatus; (Hart & Elford, 2010; Marks et al., 2010; McConnell et al., 2010; Snowden et al., 2011; Wei et al., 2010); 2) strategic positioning: HIV-negative partner practicing insertive anal sex and HIV-positive partner practicing receptive anal sex (Beachler et al., 2011; Dubois-Arber, Jeannin, Lociciro, & Balthasar, 2011); and 3) engaging in sexual activities other than anal intercourse, such as oral sex (Prestage et al., 2005; Reisner, Mimiaga, Skeer, & Mayer, 2009). Among MSM who engage in unprotected anal intercourse (UAI), these risk reduction strategies are thought to protect or reduce the chance of HIV transmission (Eaton et al., 2007; Eaton, Kalichman, & Cherry, 2010; Frost, Stirratt, & Ouellette, 2008; McConnell et al., 2010; Rowniak, 2009).

Risk reduction strategies can be conceptualized in a hierarchy of risk. Not engaging in anal intercourse (i.e., engaging in oral sex, mutual masturbation, frottage, etc.) is commonly considered to be low- to no-risk of HIV transmission (0–0.04% per coital act) (Dosekun & Fox, 2010). The next level of risk-taking could be considered 100% condom use during anal intercourse. While condoms protect against the transmission of HIV and do not rely on serostatus knowledge, MSM condom use failure rate during anal sex is present at 3.4–16% (de Wit, Sandfort, de Vroome, van Griensven, & Kok, 1993; Stone et al., 1999; van Griensven, de Vroome, Tielman, & Coutinho, 1988), giving rise to the potential for HIV transmission. Seroconcordant UAI in a monogamous partnership may be considered the next level of risk, as this strategy relies on accurate knowledge of one's own and one's partner's HIV serostatus and lack of sex with partners outside of the monogamous agreement. Unfortunately, there is limited research indicating the potential for seroconversion using this risk-reduction strategy. One study showed that among MSM who self-identified as serosorters and engaged in UAI with a seroconcordant regular partner had an increased the risk of seroconversion compared to those who did not engage in UAI (Hazard Ratio [HR] = 3.17, 95% Confidence Interval [CI] = 1.01, 10.0) (Jin et al., 2009). Another level up on the hierarchy of risk is seroconcordant UAI with a non-regular or casual partner. This again relies on accurate knowledge of one's own and one's partner's HIV serostatus, but without the potential safety of a monogamous relationship. Again, there has been limited research assessing the risk of seroconversion with this particular strategy. One study assessing seroconversion among seroconcordant UAI with casual and regular partners found increased risk of HIV seroconversion compared to engaging in 100% condom use among MSM (Odds Ratio [OR] = 2.0, 95% CI = 1.4, 3.0) (Golden, Stekler, Hughes, & Wood, 2008b). Another study indicated a trend toward increased risk of seroconversion among MSM who self-identified as serosorters and engaged in UAI with seroconcordant casual partners compared to not engaging in UAI (HR = 2.98, 95% CI = 0.62, 14.3) (Jin et al., 2009). Another potential step up the risk hierarchy is strategic positioning—an HIV-seronegative partner practicing insertive anal intercourse and an HIV-seropositive partner practicing receptive anal sex. Similar to serosorting, strategic positioning only has limited research indicating the risks of HIV seroconversion. One study assessing the risk of seroconversion using this strategy found that the HIV-seronegative MSM who were the insertive partner with an HIV-seropositive partner were about three times more likely to seroconvert compared to those who did not engage in UAI (HR = 2.87, 95% CI = 1.13, 7.29) (Jin et al., 2009). Another study found that MSM using this strategy had two times the odds of seroconversion compared to MSM who did not engage in UAI (OR = 1.8, 95% CI = 1.2, 2.6) (Golden et al., 2008b). Last, a study by Jin and colleagues (2010) found that using this strategy led to per contact HIV infection rates of 0.11% to 0.62%, depending on circumcision status. Partially engaging in any of the above risk-reduction strategies for more than half of the time but not engaging in any one of them with 100% adherence may open MSM to a higher likelihood of HIV-seroconversion. The highest level on the hierarchy of risk is not adhering to any of the strategies listed above. Multiple studies have shown that not using any discernible risk-reduction strategy leads to a significant increase in the likelihood of seroconversion (Golden et al., 2008b; Guy et al., 2011; Jin et al., 2009; Jin et al., 2010).

Although these strategies reflect different levels of risk, they are aimed at limiting direct HIV viral contact. The mechanisms involved in affecting public health are more complex. These approaches require accurate knowledge of one's own as well

as one's partner's HIV status, full disclosure of HIV status, and recent testing; moreover, any sexual activity between testing does not take into account the potential for transmission of other sexually transmitted infections (STIs; McDaid & Hart, 2010; Wei et al., 2010).

Eaton's 2009 review of over 51 articles found that MSM who select partners based on HIV status as a protective strategy inadvertently placed themselves at risk for HIV (Eaton, Kalichman, O'Connell, & Karchner, 2009). Specifically, MSM who practiced serosorting were more likely to believe that it protected against HIV transmission, had reduced concern about condom use, and had more UAI partners compared to those who did not practice serosorting. Moreover, their strategy lacked a comprehensive understanding of sexual risk factors, such as frequency of HIV testing of both partners, co-occurring STIs, and knowledge of acute or super HIV infections that could possibly override the assumed protective benefits (Eaton, Kalichman, et al., 2009). In contrast, a few studies have found serosorting to be protective (Cassels, Menza, Goodreau, & Golden, 2009; Marks et al., 2010). For example, a recent serosorting intervention study among Black and Latino MSM demonstrated that MSM engaging in serosorting strategies were more likely to know their HIV status than MSM who did not serosort, and MSM who received the serosorting intervention reported fewer sexual partners at follow-up (Marks et al., 2010). However, these authors note that their findings should be interpreted with caution as other studies have found that sero-adaptive practices actually contribute to rising rates in HIV transmission (Golden et al., 2008a; Hart & Elford, 2010; Osmond, Pollack, Paul, & Catania, 2007) and the CDC does not recommend serosorting as a safer sex practice (Centers for Disease Control and Prevention, 2011b).

None of these studies address the specific needs of AIAN MSM. The current study used data from a seven-site study of AIAN MSM to identify HIV risk reduction strategies across respondents with known HIV serostatus. The aims were to describe sexual behavior by HIV serostatus, identify sexual risks associated with serodiscordant and seroconcordant partnerships, and describe types of risk reduction strategies adopted in this community-based sample.

METHODS

PARTICIPANTS AND SETTING

Participants were recruited as part of a multi-site cross-sectional survey of AIAN MSM from seven metropolitan areas in the United States: Seattle–Tacoma, San Francisco–Oakland, Los Angeles, Denver, Tulsa–Oklahoma City, Minneapolis–St. Paul, and New York. Participants were recruited from July 2005 and March 2007 and: (1) self-identify as American Indian, Alaska Native, or First Nations and either enrolled in their tribal nation or report having at least 25% total American Indian blood; (2) self-identify as gay, lesbian, bisexual, transgender, or two-spirit (GLBT-TS) or have engaged in same-sex sexual behavior in the past 12 months; (3) are 18 years of age or older; (4) speak English; and (5) reside, work, or socialize in one of the urban study sites. A total of 447 respondents met the eligibility criteria of which 235 were men (227 men and 8 anatomically male transgender persons). Of these recruits, 12 men identified as being attracted only to women and reported never having had sex with a man; 38 reported not having had sex with a man in the past 12 months; and 11 reported not knowing their HIV status. The current study was restricted to par-

ticipants who were anatomically male, had sex with a man in the past 12 months, and knew their HIV serostatus, resulting in a total sample size of 174 participants.

PROCEDURES

This study is a secondary analysis of data from the HONOR Project (Cassels et al., 2010; Chae & Walters, 2009; Lehavot, Walters, & Simoni, 2009; Nelson, Simmoni, Pearson, & Walters, 2011). Participants were recruited using a combination of three methods (i.e., targeted, partial network, and respondent-driven sampling [RDS] techniques) designed to maximize coverage of the heterogeneity of the population and to minimize selection bias. At one site, a census site, we also attempted to enroll all eligible individuals and recruited "volunteer participants" who were solicited through newsletters, brochures, posters, and word-of-mouth. The study coordinator, working with each site, enumerated six to eight diverse (by gender and age) first wave "seeds" (n = 36), of which 33 participated. Seeds were identified by our local agency partners as individuals who were connected to GLBTT-S individuals within each metropolitan area. Overall, 53.1% were male, 40.6% were female, and 6.3% were transgender, with a mean age of 36.8 years (standard deviation 12.9, range 20–67). Up to four partners were randomly selected from within each nominator network. A second wave of network or nominee respondents generated 58 individuals, of which 50 participated. In addition, 368 (80.1%) of the 469 solicited volunteers participated. There were no significant differences between RDS (seeds and nominees) and census site's volunteer respondents for the cohort overall or by site on key socio-demographic variables (i.e., gender, education, employment, income, or housing) that might reflect regional or sampling differences. Each respondent received $65 for completing a comprehensive 3–4 hour social-epidemiological computer-assisted interview at the study site or an alternative private location of the participant's choice. The study was approved by the University of Washington research ethics board, and informed consent was obtained by all participants.

MEASURES

HIV Status and Sociodemographic Characteristics. Respondents reported their HIV status as HIV positive, tested HIV negative, or status unknown (by responding to either "never tested for HIV" or "was tested but never received any results") as well as the year they were diagnosed. Age was reported as year and month of birth and calculated at time of interview. Gender was defined as anatomically male (having a penis), female (having a vagina), or transgender (male to female or female to male). Having a current partner (defined as a steady romantic or sexual relationship) and being in a mutually agreed upon seroconcordant monogamous partnership in the past six months or more was calculated from a yes/no item reporting a monogamous relationship, a second items assessing length of time in the relationship, and match by respondent and partner serostatus. Socio-economic status variables included education level (dichotomized at high school/GED or higher), employment status (unemployed or employed full- or part-time), and household income (dichotomized at $1,000 per month).

Sexual Behavior. A single yes/no item assessed whether respondents had ever engaged in sex trade, defined as the exchange of sex for money, drugs, food, or shelter. "Any STI" meant reporting ever having chlamydia, gonorrhea herpes human papillomavirus, or syphilis. Length of time since last HIV testing was dichotomized at 3

months or less. To assess sexual behavior in the 12 months prior to the interview, yes/no items were used to assess sexual activity with any male partner(s) by male partner HIV status. A set of identical questions was asked for each HIV serostatus partner category (i.e., positive, negative, unknown). Specifically, we asked: number of (HIV status) partners; number of partners to whom the respondent disclosed their HIV status; number of times they engaged in insertive or receptive anal sex; and how often a condom was used when engaging in insertive or receptive anal sex (with response choices of *never*, *less than half the time*, *about half the time*, *more than half the time*, and *every single time*). Additional sex activity items included the number of times the respondent engaged in oral sex and rimming sex. Composite sexual behavior variables were constructed representing any anal insertive or receptive sex, disclosure to partners by partner's serostatus, and condom use by partner's serostatus. Unprotected anal intercourse was dichotomized by always using condoms (i.e., *every single time)* vs. less than always. Serosorting behavior was assessed from respondents' partner selection based on known or perceived HIV status. Strategic positioning was assessed for respondents who reported any insertive or receptive UAI based on partner's reported HIV status (i.e., HIV-positive respondent reporting 100% receptive sex with all HIV-negative partners and HIV-negative respondents reporting 100% insertive with all HIV-positive partners).

Risk Reduction. Based on level of biological and contextual risk, we created seven mutually exclusive categories: No anal sex—men who reported no anal sex partners (reported only oral or rimming sex); 100% condom use—men who had anal intercourse but always used condoms, for all partners and for both insertive and receptive positions; 100% seroconcordant monogamous partnership—men who had any UAI but with a monogamous partner of six months or more of the same HIV serostatus; 100% seroconcordent partnership—men who had any UAI but only with partners of the same HIV-status; Strategic positioning—men who had UAI with a HIV sero-discordant partner, but all episodes were in the insertive position for HIV-negative respondents and in the receptive position for HIV-positive respondents; Partial risk reduction strategy—engaging in condom use, seroconcordent partnership, or strategic positioning more than half or most of the time versus less than half of the time or never; No discernible strategy—this final category contains men who reported anal intercourse but did not meet the criteria for any of the above categories. To identify the most conservative risk approach, participants who fell into more than one category (i.e., 100% condom use and 100% seroconcordant monogamous partner, etc.) were counted in the first category they met in the order just described.

DATA ANALYSES

We examined sociodemographic characteristics; HIV testing, HIV serostatus disclosure, types of anal sex (insertive, receptive); and risk reduction strategies for HIV-positive versus HIV-negative MSM. Additionally, we looked at sociodemographic characteristics and types of unprotected anal sex that were associated with serodiscordant versus seroconcordant partnerships. We used Pearson chi-square for categorical data and *t* tests for continuous data, with an alpha of 0.05. Finally, we computed frequencies for risk reduction strategies.

TABLE 1. Sociodemographic Characteristics and Anal Sexual Behavior in the Past 12 Months by HIV Serostatus Among 174 American Indian/Alaskan Native Men Who Reported Ever Having Sex With a Man

	HIV-Negative		HIV-Positive		
	n = 114	(65.5%)	*n* = 60	(34.5%)	Test Statistic
Currently in a steady relationship	43	(37.7)	25	(41.7)	0.4
Seroconcordant monogamous partnership	16	(14.0)	2	(0.3)	1.2
High school/GED or higher	101	(88.6)	52	(79.4)	0.1
Currently employed (part or full time)	62	(54.4)	24	(40.0)	3.3
Household income $1,000 or less a month	62	(54.4)	29	(48.3)	1.0
Age (*M, SD*)	38.7	(10.2)	40.2	(8.0)	1.0
HIV test in the past 3 months	44	(38.6)	23	38.3)	0.0
Time since diagnoses (years)			9.2	7.1	
Reported > 1 HIV-positive partner	6	(5.3)	25	(41.7)	35.6***
Reported > 1 HIV-negative partner	64	(56.1)	14	(23.3)	17.1***
Any partners	78	(68.4)	47	(78.3)	1.9
Anal Insertive sexz	64	(56.1)	32	(53.3)	0.1
Anal Receptive sex	56	(49.1)	44	(73.3)	9.4**
HIV+ partners	11	(9.7)	38	(63.3)	56.0***
Anal Insertive sex	9	(7.9)	25	(41.7)	28.5***
Anal Receptive sex	8	(7.0)	35	(58.3)	55.6
HIV- partners	67	(59.0)	22	(36.7)	7.7***
Anal Insertive sex	56	(49.1)	12	(20.0)	14.0***
Anal Receptive sex	50	(43.9)	21	(35.0)	1.3
HIV status-unknown partners	26	(22.8)	13	(21.7)	0.0
Anal Insertive sex	21	(18.4)	9	(15.0)	0.3
Anal Receptive sex	19	(16.7)	12	(20.0)	0.3

Notes: + positive serostatus; - negative serostatus; ? unknown serostatus.
Test statistics are derived using Pearson chi-square for categorical data and t test for continuous data; *M* = mean, *SD* = standard deviation; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

RESULTS

Participants had a mean age of 39.3 years (standard deviation [*SD*] = 10.2). About a third (28.7%) were in a mutually agreed-upon monogamous relationship, most (87.9%) had a high school or higher level of education, about half (49.4%) were employed, and (52.3%) reported household monthly income of less than $1,000.

As seen in Table 1, there were no important serostatus differences for the overall sample in sociodemographics, but there were for risk behaviors. Specifically, HIV-positive MSM were more likely than HIV-negative MSM to report more than one HIV-positive partner (41.7% versus 5.3%, $\chi^2 = 35.6$, $p < 0.001$) and to report anal sex with their HIV-positive partners rather than their HIV-negative partners (63.3% versus 9.7%, $\chi^2 = 56.0$, $p < 0.001$). Conversely, HIV-negative MSM were more likely than HIV-positive MSM to report more than one HIV-negative partner (56.1% versus 23.3%, $\chi 2 = 17.1$, $p < 0.001$) and to report anal sex with HIV-negative than HIV-positive partners (59.0% versus 36.7%, $\chi 2 = 7.7$, $p < 0.01$).

Among the 159 MSM reporting any type of anal sex in the past 12 months, we found several risk factors associated with being in a serodiscordant partnership (see

TABLE 2. Sexual Risks in the Past 12 Months Associated with Concordant (Versus Discordant) Partnerships Among 159 American Indian/Alaskan Native Men Who Reported Having Anal Sex With a Man in the Past 12 Months

	Total		Any Serodiscordant Partner (+/-, -/+)		Seroconcordant Partnership (-/-, +/+)		
	n = 159	(%)	*n* = 83	(52%)	*n* = 76	(48%)	Test Statistic
Ever had a sexually transmitted infection	62	(39.0)	39	(47.0)	23	(30.3)	4.7*
Total number of partners (M, SD)	7.5	(13.5)	12.2	(17.6)	2.5	(2.2)	4.7***
Ever traded sex	71	(44.7)	49	(59.0)	22	(29.0)	14.5**
HIV serostatus—positive	55	(34.6)	35	(42.2)	20	(26.3)	4.4*
Serostatus disclosure to all partners	108	(68.4)	43	(52.4)	65	(85.5)	20.0***
HIV test in the past 3 months	67	(38.5)	33	(33.7)	34	(44.7)	2.2
Seropositioning	16	(10.1)	16	(19.3)	0	0.0	16.2***
100% condom use	40	(25.2)	21	(25.3)	19	(25.0)	0.1
Any partner: Any UAI	85	(53.5)	48	(57.8)	37	(48.7)	1.3
UAI Insertive sex	65	(40.9)	36	(43.4)	29	(38.2)	0.4
UAI Receptive sex	70	(44.0)	37	(44.6)	33	(43.4)	0.0
HIV+ partners: Any UAI	38	(23.9)	22	(26.5)	16	(21.1)	0.6
UAI Insertive sex	24	(15.1)	13	(15.7)	11	(14.5)	0.0
UAI Receptive sex	35	(22.0)	20	(24.1)	15	(19.7)	0.4
HIV- partners: Any UAI	50	(31.5)	29	(34.9)	21	(27.6)	1.0
UAI Insertive sex	37	(23.3)	19	(22.9)	18	(23.7)	0.0
UAI Receptive sex	40	(25.2)	22	(23.7)	18	(26.5)	0.2
HIV ? partners: Any UAI[a]	28	(17.6)	27	(32.5)	0	0.0	
UAI Insertive sex	22	(13.8)	21	(25.3)	0	0.0	
UAI Receptive sex	20	(66.7)	20	(66.7)	0	0.0	

Note. Test statistics are derived using Pearson chi-square for categorical data and t test for continuous data; STI, sexually transmitted infection. Discordant partners (+/-, -/+) are HIV-positive respondents with HIV-negative partners and HIV-negative respondents with HIV-positive partners. Concordant are seropositive with seropositive partners (n = 20) and sero-negative with sero-negative partners (*n* = 56).

[a]There are no concordant partnerships with unknown serostatus.

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 2). Specifically, participants in a serodiscordant partnership were less likely to disclose their HIV status to all their partners (52.4% versus 85.5%, $\chi^2 = 20.0$, $p < 0.001$) compared to those in a seroconcordant partnership. Among men in serodiscordant partnerships, 16 (19.3%) reported seropositioning, about a quarter 21 (25.3%) reported 100% condom use, and 33 (33.7%) reporting testing for HIV in the past three months. Pertaining to HIV and STI transmission risk factors, respondents in serodiscordant partnership were more likely to report ever having an STI (47.0% versus 30.3%, $\chi^2 = 4.7$, $p < 0.01$); having traded sex for money or drugs (59.0% versus 29.0%, $\chi^2 = 14.5$, $p < 0.01$), and having a HIV positive serostatus (42.2% versus 26.3%, $\chi^2 = 20.0$, $p < 0.001$). They also reported more sexual partners in their lifetime (12.2 versus 2.5, $t = 4.7$, $p < 0.001$).

Most (94.8%) of the overall sample reported some risk reduction strategy. As seen in Table 3, 49 (28.2%) reported no anal sex, 40 (23.0%) reported 100% con-

TABLE 3. Risk Reduction Strategies in the Past 12 Months Among 174 American Indian/Alaskan Native Men Who Reported Ever Having Sex With a Man

	Total		HIV-Negative		HIV-Positive		
	N = 174	(%)	*n* = 114	(66%)	*n* = 60	(34%)	Test Statistic
No anal sex	49	(28.2)	36	(31.6)	13	(21.7)	1.9
100% condom use	40	(23.0)	29	(25.4)	11	(18.3)	2.6
100% seroconcordant monogamous partnership	14	(8.0)	12	(10.5)	2	(3.3)	2.7
100% seroconcordant partnership	26	(14.9)	12	(10.5)	14	(23.3)	5.1*
100% strategic positioning	16	(9.2)	7	(6.1)	9	(15.0)	3.7
Partial risk reduction strategy	23	(11.5)	16	(9.6)	7	(15.0)	0.8
No discernible strategy	9	(5.2)	7	(6.1)	2	(3.3)	0.0

Note. Each risk reduction strategy is mutually exclusive. Although a person could fall into more than one category (i.e., 100% condom use and 100% seroconcordant partner), they were counted in the first category for the criteria they met (i.e., 100% condom use). Partial risk reduction strategy is defined as condom use, seroconcordent partnership, or strategic positioning more than half or most of the time. Test statistics are derived using Pearson chi-square.
*$p < 0.05$.

dom use, and 14 (8%) were in a seroconcordant monogamous partnership. Of the remaining 74 men, 65 engaged in some form of HIV harm reduction strategy. Although this is promising, of the 65 men who reported any sero-adaptive strategy (e.g., seroconcordant partnership, strategic positioning, or partial risk reduction), only 35 (54.7%) disclosed their serostatus to their partners and 27 (41.5%) tested for HIV in the past 3 months (data not shown in table).

DISCUSSION

Results from the seven site survey of AIAN MSM demonstrate that although most AIAN MSM use risk reduction strategies, they remain at risk for HIV transmission (Centers for Disease Control and Prevention, 2011b). Specifically, among this generally educated but low income sample of urban AIAN MSM, only about half reported sexual practices that are likely not to transmit HIV (e.g., 100% condom use, or in a long-term seroconcordant monogamous partnership) or had very low transmission risk (i.e., rimming or oral sex). Attempting to be protective, a quarter of the men practiced serosorting or strategic positioning and engage in these practices often. However, these types of strategies without consideration of other factors may not reduce risk of HIV transmission as only about half of the respondents reported disclosing their HIV status and less reported a recent HIV test. We found MSM in seroconcordant (versus discordant) relationships had lower overall HIV risk indicators (i.e., fewer STIs and lifetime partners, lower likelihood of disclosing their HIV serostatus), suggesting that it may not be serosorting that is protective but rather a person's lifetime sexual risk behavior.

For AIAN MSM practicing sero-adaptive strategies, this is truly a cautionary tale. Although sero-adaptive practices may appear to provide some protection against HIV transmission (Cassels et al., 2010; Eaton, Cherry, Cain, & Pope, 2011), data suggest that these practices are inconsistent, unpredictable, and unreliable as forms of prevention (Centers for Disease Control and Prevention, 2011b; Eaton et al., 2010; Zablotska et al., 2009). Sero-adaptive practices, such as relying on ac-

curate disclosure of HIV serostatus of both parties, have been shown to lull MSM into a false sense of security, leading to a decrease in their HIV prevention behaviors (Centers for Disease Control and Preventnion, 2011b; Eaton et al., 2010; Zablotska et al., 2009). For example, sero-adaptive strategies require up-to-date HIV testing for both partners and accurate disclosure of HIV status (Centers for Disease Control and Prevention, 2011b). Without the timely and accurate understanding of HIV status, sero-adaptive practices can lead to HIV infection. Although the majority of the men in our sample reported some risk reduction practices, the efficacy of the reported sero-adaptive practices is compromised by the factors mentioned above and can potentially lead to further risk for infection. So far, 100% condom use remains the most effective form of HIV prevention for those who engage in anal sex, and this was only reported in about half of our sample respondents reporting anal sex. Although the sero-adaptive practice of serosorting did yield positive behaviors in that the MSM in our sample had lower overall HIV risk factors, they comprised less than 30% of the overall sample. Further, 18% of the sample reported no strategic prevention planning, leading to possible greater rates of risk for infection and transmission in the AIAN MSM community. Essentially, the message is one of continued vigilance. Though sero-adaptive practices have been shown on some occasions to have protective benefits, our results suggest that the risk may be greater than imagined. It is of particular relevance for communities that are at greater risk for infection to take proven protective measures to prevent infection and transmission of HIV/AIDS rather than relying on prevention methods that may or may not be successful depending on the up-to-date knowledge and disclosure of one's own and one's partner's HIV serostatus.

There were several limitations to our study. Given that this was a cross-sectional study, causal explanations of the associations among the variables is not possible. As with other self-reports of sensitive information, our data are subject to the possible influences of social desirability and recall bias. Although we used computer-assisted self-interviewing to reduce inhibitions about disclosing, the accuracy of respondents' responses and accurate knowledge about partners' HIV status cannot be determined. As risk behaviors are more likely to be underreported if they are reported inaccurately, our findings are likely conservative estimates. Clustering by network traits and social networks may affect the probability of participant selection. Since most of the sample entered in as volunteers, these characteristics were not weighted in our analysis. Despite these limitations, the findings provide some of the first insights into sero-adaptive behavior among HIV-positive and HIV-negative AIAN MSM, a group that has rarely been identified in HIV prevention efforts.

In conclusion, our findings can help inform HIV prevention efforts among AIAN MSM communities. Public health messages directed towards AIAN MSM should continue to encourage and support proven risk reduction practices including condom use and reductions in sexual partners. However, these messages should emphasize the importance of both partners disclosing HIV status, frequent HIV testing, as well as warnings about the potential pitfalls of relying solely on sero-adaptive practices (Eaton, Kalichman, et al., 2009; Eaton, West, Kenny, & Kalichman, 2009). Efforts to reduce HIV transmission risk in this community may require a multipronged prevention effort that incorporates social–structural, behavioral, and biomedical approaches (Hart & Elford, 2010).

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