DRAFT

Individual and Partnership-level Characteristics of Two-Spirit Native Americans that May Increase Risk of HIV Transmission

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1. Introduction

Among American Indians and Alaska Natives (i.e., "Natives') between the ages of 15 and 44 years, AIDS is currently the ninth leading cause of death. Although AIDS cases among Natives represent less than 1% of the total number reported to CDC in 2004 (Centers for Disease Control and Prevention 2004), when population size is taken into account, Natives ranked 3rd in rates of HIV/AIDS diagnosis, after African Americans and Hispanics (Centers for Disease Control and Prevention 2006). The rate of AIDS diagnosis for this group has been higher than that for Whites since 1995. Along with African Americans, Natives were the only racial/ethnic group to experience an increase in HIV incidence between 1990 and 2004 (The Henry Kaiser Family Foundation 2006). Men who have sex with men (MSM) and MSM injection drug users (IDU) account for an estimated 42% of new cases (CDC 2006). Indeed, sexual minorities such as gay, lesbian, bisexual, and transgender (GLBT) individuals (often referred to as "two-spirit"), encounter heterosexism in mainstream U.S. society in addition to heterosexism in many traditional Native societies.

Recent evidence suggests that sexual network dynamics, including concurrency and partnership mixing, play an important role in racial disparities in HIV in the US (Adimora and Schoenbach 2005), [Martina's new work]. Concurrency – an individual's having multiple sexual partnerships that overlap in time – can raise the magnitude of the HIV epidemic in a population enormously, even though having concurrent partners is no more risky for an individual than is having the same number of partners sequentially (Morris and Kretzschmar 1997). The partners of the person who has multiple concurrent partners bear the risk because the partners are exposed to risk from both the original partner and from that partner's other concurrent partners. At a population-level, concurrent partnerships link individuals together to create large connected "components" in a network; such connected components allow a pathogen to travel rapidly and efficiently. The longer the concurrent partnerships, the more time the pathogen has to spread throughout the population. In addition, assortative mixing (i.e., individuals choosing sexual partners with similar sociodemographic attributes) leads to segregated networks which channel infection and can sustain long-term prevalence differentials, like the persistent racial differentials in HIV and other STI in the US (Adimora et al. 2002; Morris et al. 2006).

In the present study, we used data from the first national study of two-spirit Natives to describe sexual partner variables and partnership-level characteristics and to identify relational formations that are potentially related to high risk of HIV transmission or acquisition. We aimed to identify potential strategies for HIV prevention efforts targeting at-risk population.

2. Methods

Respondent Recruitment

Respondents were recruited as part of a multi-site cross-sectional survey of Native two-spirit persons. The study was conducted between October 2005 and November 2006 in six U.S. cities (i.e., Seattle, Oakland, Los Angeles, Tulsa, Minnesota, and New York). Local recruitment and interviewing were conducted at community-based cultural and social centers serving the Native community.

Respondent recruitment included both targeted sampling and respondent-driven sampling techniques. In Seattle, the census site, the study was open to the entire Native GLBT community, and individuals were recruited with study brochures and posters, display tables at relevant events, and word-of-mouth. At each of the other five sites, the local site coordinator developed a targeted sampling list of first-wave "seeds" (approximately 8 per site). The seeds consisted of equal numbers of men and women who varied in age and gender expression. Also, volunteers were solicited via agency newsletters, study brochures and posters, and word-of-mouth.

To participate, individuals were required to (a) be American Indian, Alaskan Native, or First Nation AND either enrolled in their tribal nation OR at least one-quarter in total American Indian blood quantum; (b) self-identify as gay, lesbian, bisexual, transgender, or two-spirit OR have had sexual relations with someone of the same biological sex during the past 12 months; (c) reside, work, or socialize in the local study site: (d) be 18 years of age or older; and (e) speak English.

Eligible individuals who provided written consent were enrolled in the study. Each respondent received $60 for completing a 3-4 hour interview, which was administered as a computer-assisted personal interview in a private location of the respondent's choosing. All respondents (i.e., seeds, volunteers, and later nominees) then provided information about their social networks in order to identify other potential respondents. They were then given printed coupons and asked to give one to each social network member they identified who met the study criteria (i.e., a "nominee"). For each of their nominees who contacted the study staff, respondents were reimbursed $10.00 (they were never informed of which nominees responded). Additionally, each respondent received two additional coupons to distribute to other potential respondents they might later recall or meet (coupons were coded to this effect). Duplicity in this study was limited since each site had one site coordinator and a small sample.

Across sites, 37 seeds and XX volunteers participated, and 1,055 coupons were issued. Seventy-nine nominees presented with coupons, of whom 68 were deemed eligible to participate and XX actually participated. Of the XX volunteer who inquired about participation, XX met the eligibility requirements, and 446 (this number should be the total – 68? – no, this is the total participation number seed + volunteers + nominees. Note we drop 2 be/c later it was determined they did not meet the eligibility requirement so 444) agreed to participate and gave written consent.

Measures

Socio-demographic Characteristics and HIV Status. Respondents indicated their biological sex at birth; current gender identity (coded as male, female, or transgendered); sexual orientation; age; marital/relationship status; Native blood quantum; and tribal enrollment status. Socio-economic status variables included education level; employment status (unemployed, employed part-time, or employed full-time); and income. Respondents also indicated whether they were HIV-positive, HIV-negative, or of unknown HIV status.

Sexual Behavior. Multiple closed-ended items queried sexual behaviors over the respondent's lifetime as well as the last 12 months. All respondents were asked about same-sex and opposite-sex partners, with subsequent questions based on gender-specific pairings. Additionally, more extensive information was collected for each of the respondent's last 3 partnerships (with no time limitation), including month and year of first and last sexual encounter and number of times a sexual encounter (i.e. oral, anal, or vaginal sex) occurred without a condom. Questions about anal and vaginal sexual acts were specified as "sex with a penis/dildo."

Sexual Partner Characteristics. For each of their last 3 sexual partners, respondents provided the partner's initials; partner's sex; partner's race/ethnicity; length of time with the partner before having sex; approximate start and end dates of the partnership (i.e., sexual contact); and estimated number of individuals the partner was having sex with during the relationship.

3. **Data Analyses**

The first step in the analyses involved constructing a timeline of partnerships for each respondent based on the reported start and end dates of sexual contact (the units of duration were in months). In some cases,

the reported end date of a partnership for the second-most recent partner was in fact more recent than the reported end-date for the most recent partner. In these cases we assume that the reported dates were correct, but the reported ordering of partnerships was not. Therefore, the ordering of partnerships was re-structured to ensure that the end-dates of the partnerships aligned with their ordering.

Next, we calculated concurrency based on the partnership timelines. Because durations were measured in months, we could not determine concurrency when one partnership ended and another other began in the same month. In these cases, we conservatively assumed no concurrency (hence actual concurrency was likely higher than we estimated).

For respondents who reported information on three lifetime partners, concurrency could potentially range from 0 – 3. As seen in Figure 1, concurrency = 0 is the instance of serial monogamy, which involves a period of abstinence before and after each partnership. We also consider respondents with only one total lifetime partner to have concurrency = 0. If two partnerships overlap only with each other, then concurrency = 1. If a first partnership overlaps with a second and, at a separate time, the second overlaps with a third, then concurrency = 2. Finally, if all three partnerships occur at any given time, then concurrency = 3.

-- Insert Figure 1 about here --

Two sets of analyses were then conducted. The first used the respondent as the unit of analysis and focused on concurrency based on all three of the respondent's reported partnerships. We first present a description of the concurrency data by respondent attribute; then one-way ANOVA's were used to determine which respondent attributes were associated with higher levels of concurrency.

The second set of analyses considered the partnership as the level of analysis and focused on the characteristics of partners and partnerships. Results of the partnership-level analyses are organized by race of partner and partnership type (i.e., male – male, female – female, male – female, and female – male). In these partnership monikers, the first terms refers to the respondent and the second to the partner. In the case of transgendered respondents, those with a penis were categorized as male and those without as female. The first partnership-level analysis examined the characteristics of partnership pairings by respondent and partner attribute to reveal mixing patterns. Next, variation in partnership duration was examined according to partnership type and partner's race. Lastly, concurrency patterns, concurrency duration, and unprotected sex acts were examined according to partnership type and partner's race. In each, primarily descriptive analyses and comparisons were conducted with *t* tests and chi-square tests.

4. Results

Respondent-level Analysis

Respondent Characteristics

Among the 444 respondents, $n = 6$ reported zero sexual partners, $n = 7$ did not answer, and 431 respondents reported that they were sexually active with one ($n = 7$), two ($n = 6$), or three or more (n = 418) lifetime partners. In this last group, $n = 95$ reported 3-10 lifetime partners; $n = 125$ reported 11-50 and $n = 198$ reported >50. These 431 sexually active respondents are referred to hereafter as the "total sample." As seen in Table 1, half of them were male, 82% had graduated from high school, and 22% were HIV-positive.

Of the 238 respondents who reported male biological sex at birth, 19 self-identified as transgendered male-to-female and reported having a penis. Of the 187 respondents who reported female biological sex at

birth, 11 identified as transgendered female-to-male. Four of the 11 transgendered female-to-male individuals reported having a penis, 6 did not, and 1 did not answer. Of the 6 respondents who reported they were born with ambiguous genitalia, 2 identified as transgendered male-to-female with a penis, and the other 4 identified as intersex female without a penis.

Respondent-level Concurrency Analysis

Due to a programming error and incomplete reporting, we were left with data on 724 partnerships and complete partnership-level data for 145 (of 431) sexually active respondents. Therefore, for the respondent-level concurrency analyses, we used an analytical sub-sample consisting of these 145 respondents who provided complete data on their partnerships. *T* tests comparing this analytic sub-sample with the sample with missing data revealed several differences (see Table 1). Specifically, respondents in the analytic sub-sample included fewer males, were more likely to be HIV-negative, were more educated and younger, and had higher incomes than those in the total sample.

-- Insert Table 1 about here --

In the second respondent-level analysis, we tested whether level of concurrency (0 – 3) varied by respondent attribute; results are described below (not shown in table). Approximately half (70 of 145, 48%) of the respondents in the analytical sub-sample reported no concurrency; for 39 (27%), it was one; 18 (12%), two; and 18 (12%), three. The mean was 0.89 (SD = 1.05).

According to one-way ANOVA's comparing mean concurrency and each socio-demographic indicator, concurrency was related to gender and HIV status. Specifically, mean concurrency was marginally significant and higher among respondents who were male (n = 60, mean = 1.12, SD = 1.08) than female (n = 71, mean = 0.69, SD = 0.98), F(X, SS) = 2.8, p = 0.06. In fact, 63% (38 of 60) of the males reported concurrency of at least one. Concurrency was also significantly higher among respondent who were HIV-positive (n = 21, mean = 1.52, SD = 1.25) than HIV-negative (n = 104, mean = 0.78, SD = 0.97), F(X, SS) = 4.8, $p < 0.01$. Only 6 of 21 (29%) of HIV-positive respondents had no concurrency at all, while 7 of 21 (33%) had a concurrency level of three.

Mean concurrency was not related sexual orientation, education, age, income, or percent Native blood.

Partnership-Level Analyses

Partnerships Characteristics

Respondents in this study reported information on 724 partnerships. Many of the respondents excluded from the analytical sub-sample for the individual-level analyses are included in the partnership-level analyses because although they did not report complete partnership data on their last three sexual partners, they provided information on at least one or two.

Partnership Mixing. Table 2 describes partnerships grouped by partner's race/ethnicity, which was coded as Native American, Black/African American, White/Caucasian, and Other (which included Native Hawaiian/Pacific Islander, Asian American, Hispanic/Latino/Chicano, and other). Five partnerships were missing race/ethnicity data and are thus excluded from all partnership-level analyses. Out of 719 partnerships reported that included data on the partner's race, 190 (26%) were with a Native partner, 63 (9%) with a Black partner, 304 (42%) with a White partner, and 162 (23%) with a partner of an other race/ethnicity.

-- Insert Table 2 about here --

Chi-square tests used to compare the racial distribution of partners by respondent characteristics revealed statistically significant differences in every respondent category except HIV status (see Table 2). When chi-squared tests were significant, individual *t*-tests were used to describe patterns within sociodemographic variables (individual *t*-test results not shown).

With respect to *gender*, female respondents had more Native partners and fewer White partners than male respondents. Differences in *sexual orientation* indicated that gay/lesbian respondents reported more White partners and fewer Native partners than other respondents. The distribution of partnerships by race also varied by respondent's *education*. Roughly, respondents with less education partnered with Native individuals, and respondents with more education partnered with White individuals. A similar pattern is seen for respondents in the highest *income* bracket. They are more likely than other respondents to have a White partner and least likely to have a Native partner. With respect to *age*, the data show a pattern of younger respondents partnering with Blacks and individuals of 'Other' race, while older respondents partner with Native and White individuals. Lastly, respondents who report less than 25% *Native blood* are more likely to have White partners, and respondents with >75% Native blood are much more likely to choose other Native partners.

Partnership Duration. Analyses involving the duration of partnerships were conducted on 640 partnerships (as 84 partnerships had missing information on duration or race). The distribution of partnership duration was strongly skewed toward short partnerships. The median duration for the total sample was 13 months (IQR: 1 – 50, max = 483), while the mean was 41 months (SD = 67).

Overall, partnership duration differed by partnership type but not by partner's race. Male-male partnerships had the shortest relationship durations (n = 266, mean = 35 months, 95% CI: 27.1 – 43.6), and male – female partnerships had the longest (n = 42, mean = 61.0 months, 95% CI: 34.9 – 87.1)

However, partnerships durations within partnership types varied by race. Within male – male partnerships, those with a Native partner had significantly shorter partnership durations (n = 38, mean = 15 months, 95% CI: 6.8 – 23.3) than other male – male partnerships. However within female – female partnerships, those with a Native partner had significantly longer durations than those with non-Native partners (n = 60, mean = 57 months, 95% CI: 38.7 – 76.2), while female – female partnerships with a White partner had significantly shorter partnerships than others (n = 81, mean = 31 months, 95% CI: 19.1 – 42.1). Significant differences in partnership duration were also found within female – male partnerships by the partner's race. Again, those with a Native partner were significantly longer than the others (n = 46, mean = 61 months, 95% CI: 38.2 – 83.2) and those with a White partner were significantly shorter (n = 42, mean = 31 months, 95% CI: 16.9 – 44.8). Additionally, female – male partnerships with a Black partner were significantly shorter than those with a non-Black partner (n = 12, mean = 13 months, 95% CI: 1.1 – 25.0). Male – female partnerships did not significantly vary by partner's race.

Partnership-level Concurrency Analysis

This next analysis identifies characteristics of those at risk in our sample: the partners of respondents reporting concurrency. For the partnership-level concurrency analysis, we needed data on at least 2 partnerships per respondent (unless the respondent reported only 1 lifetime partner) in order to determine whether concurrency occurred; thus the analytic sub-sample was reduced to 564 partnerships. Table 3 shows the prevalence of concurrency and concurrency duration by partnership type. Of 564 partnerships, 294 (52%) partnerships were not concurrent, i.e. did not overlap in time with any other partnership, while 270 (48%) were reported to be concurrent with at least one other partnership.

Male – male partnerships are significantly more likely involve concurrency than other types (n = 233, mean = 0.55, 95% CI: 0.48 – 0.61), and both female – male and male – female partnerships were significantly less likely to involve concurrency (n = 119, mean = 0.40, 95% CI: 0.31 – 0.49, and n = 33, mean = 0.33, 95% CI: 0.16 – 0.50 respectively). Prevalence of concurrency did not vary by partner's race.

The distribution of concurrency duration (i.e. the amount of time that the respondent has more than one partner) is greatly skewed toward shorter durations. The median concurrency duration is 6 months (IQR: 1 – 34, max = 288), while the mean duration is 41 months (SD = 67.1). Concurrency duration can be equal to zero if, for instance, an individual has a short partnership that starts and ends in the same month as an on-going partnership. Concurrency duration did not significantly vary by partnership type or partner's race. However, partnerships with Blacks have the highest median concurrency duration (10 months).

-- Insert Table 3 about here --

T-tests were also used to evaluate whether prevalence of concurrency and concurrency duration varied by partner's race within partnership types, although detailed test results are not reported. Within male – male partnerships, those with a Native partner are slightly less likely to involve concurrency than with non-Native partners. The highest prevalence of concurrency was seen in partnerships with a partner of other race. However, concurrency duration matters significantly, and concurrency duration is significantly higher in male – male partnerships with a Black partner.

In female – female and female – male partnerships, prevalence of concurrency was significantly higher when the partner is Native than when the partner is of another race. Out of 54 female – female partnerships with a Native partner, 30 (56%) involved concurrency, and the concurrency duration is significantly higher in these partnerships compared partnerships with other races as well. In female – male partnerships, more than 50% of partnerships with a Native partner involved concurrency compared to 40% or less for all other groups. In female – female partnerships, rates of concurrency were significantly lower when the partner is White compared to non-white. The same finding was seen for female – male partnerships. Within female – male partnerships, concurrency duration was longest for partnerships with partners of an other race.

HIV risk behavior in partnerships

For analyses of risky sexual behavior, we defined unprotected sex as a sexual act without a condom (or other barrier for oral sex) at any time during a partnership. Unlike concurrency, unprotected sex places both the respondent and the partner at higher risk of HIV (or other STD).

As seen in Table 4, unprotected sexual acts varied by partnership type (unprotected oral sex: $X^2 = 17.2$, $P < 0.01$; unprotected anal sex: $X^2 = 35.3$, $P < 0.01$; unprotected vaginal sex: $X^2 = 8.3$, $P < 0.05$). Prevalence of unprotected oral and anal sex was significantly higher for male – male partnerships (n = 221, mean = 0.76, SD = 0.43, 95% CI: 0.71 – 0.81, and n = 135, mean = 0.46, SD = 0.50, 95% CI: 0.40 – 0.52 respectively) compared to other types of partnerships. Prevalence of unprotected vaginal sex was significantly higher for male – female partnerships (n = 36, mean = 0.77, SD = 0.43, 95% CI: 0.64 – 0.89) than all other types. The lowest prevalence of unprotected oral sex was for female – male relationships (n = 91, mean = 0.57, SD = 0.50, 95% CI: 0.49 – 0.65), for unprotected anal sex, female – female partnerships (n = 44, mean = 0.21, SD = 0.41, 95% CI: 0.15 – 0.26), and for unprotected vaginal sex, female – female partnerships (n = 122, mean = 0.58, SD = 0.50, 95% CI: 0.51 – 0.64).

Prevalence of unprotected oral and vaginal sex also varied by partner's race ($X^2 = 10.9$, $P < 0.05$ and $X^2 = 9.2$, $P < 0.05$ respectively). Prevalence of ever having unprotected oral sex was significantly higher with

White partners (n = 229, mean = 0.76, SD = 0.43, 95%CI: 0.71 – 0.81) compared to other partners, and significantly lower with Native partners (n = 116, mean = 0.63, SD = 0.48, 95%CI: 0.56 – 0.70). Prevalence of ever having unprotected vaginal sex was also significantly higher when the partner was White (n = 107, mean = 0.71, SD = 0.46, 95%CI: 0.63 – 0.78).

-- Insert Table 4 about here --

Individual *t*-tests within partnership types reveal some consistent findings with regard to prevalence of unprotected oral sex by partner's race (although detailed test results are not reported). Within male – male partnerships, prevalence of unprotected oral sex is significantly higher when the partner is White. The same result is seen within female – male partnerships; prevalence of unprotected oral sex is significantly higher in partnerships with a White partner. Prevalence of unprotected oral sex is significantly lower in female – male partnerships when the partner is Native, and in all partnership types with a Native partner, the prevalence is lower than the across-race average.

Next, with respect to anal sex, a few significant differences in prevalence of unprotected sex by race of the partner are seen in male – male and female – male partnerships. Within male – male partnerships, reported prevalence of unprotected anal sex is significantly higher when the partner is Black. On the other hand, within female – male partnerships, the prevalence is significantly lower when the partner is Black.

Lastly, unprotected vaginal sex significantly differed by race in female – female partnerships. As seen with unprotected oral sex, prevalence of unprotected vaginal sex also was significantly higher when the partner was White within female – female as well as in female – male partnerships. Among female – female partnerships, unprotected vaginal sex was less prevalent when the partner was of an other race, as with male – female partnerships. The lowest levels of unprotected vaginal sex among female – male partnerships occurred when the partner was Black, and among male – female partnerships when the partner was of an other race.

5. Discussion

- Rates of concurrency are high: compare to other populations…?
- We see assortative mixing with high %Native blood choosing Native partners, and least % Native blood with white partners.
- Race differentials (Black MSM: short relationships, but also see longest duration of concurrency.
- Native partners were often put at risk by concurrency: being the partner of female – female and female – male partnerships involving concurrency, and had a long concurrency duration
- Whites were the race least likely race to be partners in female – female and female – male partnerships involving concurrency
- Mixing: native respondents with whom? Tease out overall patterns
- The highest risk of unprotected oral and vaginal sex often was when the partner was White.
- Caveat: small sample sizes
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Figure 1: Type of overlap in concurrent partnerships with the last three partners among Native American GLBT-Two-Spirit

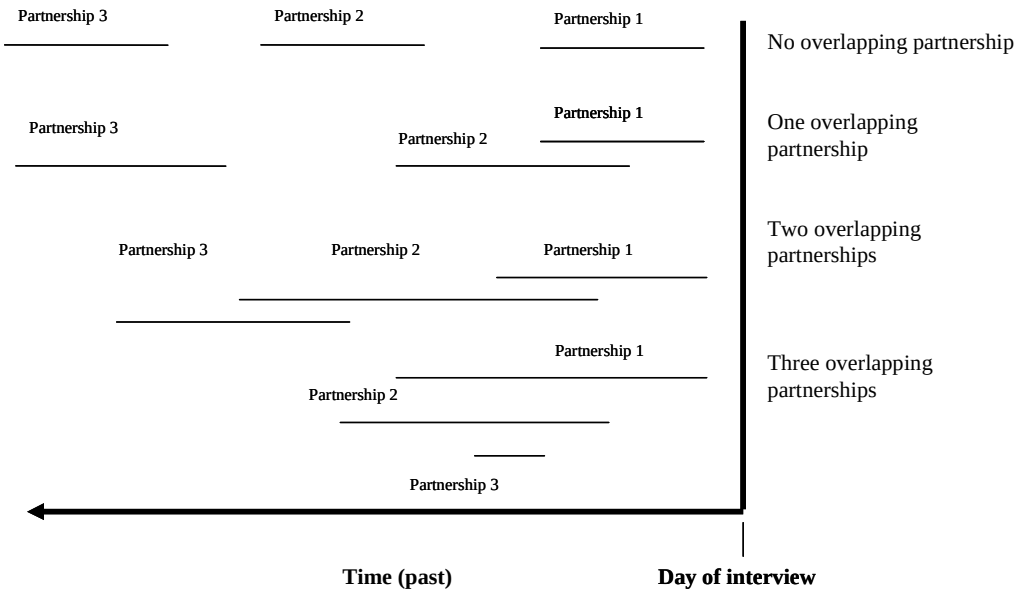

Table 1: Sociodemographic characteristics of the total sample and analytic sub-sample of two-spirit Natives

	Total sample (*N* = 431)		Analytic sub-sample (*n* = 145)	
Respondent Characteristics	N	%	N	%
*Gender**				
Male	219	50.8	60	41.4
Female	180	41.8	71	49.0
Transgendered M-F	21	4.9	8	5.5
Transgendered F-M	11	2.6	6	4.1
Sexual orientation				
Gay/lesbian	195	45.2	74	51.0
Bisexual	123	28.5	34	23.4
Two-spirit	69	16.0	27	18.6
Heterosexual	27	6.3	7	4.8
Other	17	3.9	3	2.1
*Education***				
<11 years	76	17.6	12	8.3
12 years	127	29.5	32	22.1
13 - 15 years	141	32.7	56	38.6
16+ years	87	20.2	45	31.0
*Monthly income***				
No income	42	9.9	16	11.1
<$500	126	29.6	37	25.7
$500-$1000	100	23.5	22	15.3
$1000-$2000	82	19.2	32	22.2
>$2000	76	17.8	37	25.7
*Age (in years)**				
18 - 24	31	7.3	16	11.2
25 - 34	113	26.5	46	32.2
35 - 44	126	29.5	35	24.5
45 - 79	157	36.8	46	32.2
% Native blood				
<25%	28	6.5	11	7.6
25 - 49%	120	27.9	45	31.3
50 - 74%	98	22.8	33	22.9
>=75%	184	42.8	55	38.2
*HIV status**				
HIV-negative	290	67.4	104	71.7
HIV-positive	95	22.1	21	14.5
HIV-unknown	45	10.5	20	13.8

Notes: The analytic sub-sample consists of respondents who did not have any missing partnership data
Chi-square test were used to compare the analytic sub-sample (*n* = 145) and the sample with missing data (n = 286, not shown)
*p<0.05
**p<0.01

Table 2: Characteristics of 719 partnerships involving two-spirit Natives, by respondent characteristics and partner's race

	Partner's race									
	Native		Black		White		Other		ALL	
Respondent characteristics	N	%	N	%	N	%	N	%	N	%
Total	190	26.4	63	8.8	304	42.3	162	22.5	719	100.0
*Gender****										
Male	66	21.2	31	10.0	155	49.8	59	19.0	311	100.0
Female	113	32.8	26	7.5	122	35.4	84	24.3	345	100.0
Transgendered M-F	8	20.0	3	7.5	17	42.5	12	30.0	40	100.0
Transgendered F-M	3	13.0	3	13.0	10	43.5	7	30.4	23	100.0
*Sexual orientation****										
Gay/lesbian	66	19.9	35	10.5	168	50.6	63	19.0	332	100.0
Bisexual	73	37.2	17	8.7	59	30.1	47	24.0	196	100.0
Two-spirit	27	23.5	8	7.0	55	47.8	25	21.7	115	100.0
Heterosexual	19	38.0	1	2.0	15	30.0	15	30.0	50	100.0
Other	5	19.2	2	7.7	7	26.9	12	46.2	26	100.0
*Education****										
<11 years	37	39.4	4	4.3	21	22.3	32	34.0	94	100.0
12 years	65	35.1	14	7.6	56	30.3	50	27.0	185	100.0
13 - 15 years	54	21.0	24	9.3	135	52.5	44	17.1	257	100.0
16+ years	34	18.6	21	11.5	92	50.3	36	19.7	183	100.0
*Monthly income****										
No income	19	26.4	7	9.7	27	37.5	19	26.4	72	100.0
<$500	78	38.0	22	10.7	59	28.8	46	22.4	205	100.0
$500-$1000	33	25.0	6	4.5	61	46.2	32	24.2	132	100.0
$1000-$2000	30	19.9	14	9.3	70	46.4	37	24.5	151	100.0
>$2000	29	19.0	14	9.2	84	54.9	26	17.0	153	100.0
*Age (in years)**										
18 - 24	15	23.8	7	11.1	20	31.7	21	33.3	63	100.0
25 - 34	51	23.7	27	12.6	85	39.5	52	24.2	215	100.0
35 - 44	55	28.4	7	3.6	86	44.3	46	23.7	194	100.0
45 - 79	68	28.2	22	9.1	109	45.2	42	17.4	241	100.0
*% Native blood****										
<25%	8	16.0	3	6.0	32	64.0	7	14.0	50	100.0
25 - 49%	40	18.3	17	7.8	113	51.8	48	22.0	218	100.0
50 - 74%	38	23.9	25	15.7	63	39.6	33	20.8	159	100.0
>=75%	104	36.0	17	5.9	94	32.5	74	25.6	289	100.0
HIV status										
HIV-negative	134	27.2	41	8.3	212	43.1	105	21.3	492	100.0
HIV-positive	28	19.3	16	11.0	62	42.8	39	26.9	145	100.0
HIV-unknown	27	33.3	6	7.4	30	37.0	18	22.2	81	100.0

chi-square test
*p<0.05
**p<0.01
***p<0.001

Table 3: Concurrent partnerships and median concurrency duration for 564 partnerships involving two-spirit Natives, by partnership type and partner's race

	Native		*Black*		*White*		*Other*		*All*	
	n (%)	duration (IQR)	n (%)	duration (IQR)	n (%)	duration (IQR)	n (%)	duration (IQR)	n (%)	duration (IQR)
Male -- Male	14 (42.4)†	2 (0 - 24)	17 (56.7)	12 (2 - 54)†	69 (54.8)	4 (0 - 19)	28 (63.6)†	2 (0 - 11.5)	128 (54.9)**	3 (0 - 29)
Female -- Female	30 (55.6)†	19 (2 - 64)**	4 (33.3)	13.5 (8.5 - 25)	31 (40.3)†	8 (3 - 35)	18 (50.0)	6.5 (3 - 37)	83 (46.4)	8 (3 - 39)
Female -- Male	20 (51.3)*	4.5 (0.5 - 27)	4 (33.3)	2.5 (0.5 - 7.5)	12 (31.6)†	7 (0 - 14)*	12 (40.0)	36 (7 - 70)*	48 (40.3)*	7 (0.5 - 27)
Male -- Female	3 (42.9)	3 (1 - 8)	1 (50.0)	1 (1 - 1)	7 (36.8)	1 (0 - 3)	0 (0.0)*	--	11 (33.3)*	1 (0 - 3)†
TOTAL	67 (50.4)	6 (1 - 39)†	26 (46.4)	10 (2 - 33)	119 (45.8)	6 (0 - 20)†	58 (50.4)	5.5 (1 - 43)	270 (47.9)	6 (1 - 34)

Note: duration = median duration of overlap (months)
The first gender listed is the respondent (e.g., male - female = male respondent and female partner)
Two-sample t-test (by race) with equal variances
†p<0.10
*p<0.05
**p<0.01

Table 4: Prevalence of ever having unprotected sex acts during partnership, by partnership type and partner's race for two-spirit Natives

	Native	*Black*	*White*	*Other*	*All*
	n (%)	n (%)	n (%)	n (%)	n (%)
Unprotected oral sex**					
Male -- Male	33 (71.7)	26 (76.5)	119 (78.8)†	43 (70.5)	221 (75.7)**
Female -- Female	47 (69.1)	11 (73.3)	63 (72.4)	28 (65.1)	149 (70.0)
Female -- Male	26 (45.6)*	6 (50.0)	30 (69.8)*	29 (61.7)	91 (57.2)**
Male -- Female	10 (71.4)	2 (100.0)	17 (81.0)	6 (60.0)	35 (74.5)
*Total**	116 (62.7)**	45 (71.4)	229 (75.8)**	106 (65.9)	496 (69.8)
Unprotected anal sex**					
Male -- Male	23 (50.0)	21 (61.8)*	66 (43.7)	25 (41.0)	135 (46.2)**
Female -- Female	12 (17.6)	4 (26.7)	17 (19.5)	11 (25.6)	44 (20.7)**
Female -- Male	22 (39.3)	1 (8.3)*	15 (35.7)	17 (36.2)	55 (35.0)
Male -- Female	6 (42.9)	1 (50.0)	8 (38.1)	3 (30.0)	18 (38.3)
Total	63 (34.2)	27 (42.9)	106 (35.2)	56 34.8)	252 (35.5)
Unprotected vaginal sex*					
Female -- Female	38 (55.9)	9 (60.0)	58 (66.6)*	17 (40.5)**	122 (57.5)**
Female -- Male	40 (71.4)	6 (50.0)†	33 (76.7)†	29 (61.7)	108 (68.3)†
Male -- Female	12 (85.7)	2 (100.0)	16 (76.2)	6 (60.0)†	36 (76.6)*
*Total**	90 (65.2)	17 (58.6)	107 (70.9)*	52 (52.5)**	266 (63.8)

Risk of unprotected vaginal sex is not reported for male - male relationships
Vaginal and anal sex were specified as either with a penis or a dildo
chi-square test (and, for now, t tests as well)
†p<0.10
*p<0.05
**p<0.01

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