

**DISCORDANCE BETWEEN PERCEIVED HIV RISK  
AND SELF-REPORTED RISKY BEHAVIOR IN AN  
URBAN AMERICAN INDIAN & ALASKA NATIVE POPULATION**

by

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## **Abstract**

Although HIV/AIDS rates in the American Indian & Alaska Native (AIAN) population are relatively low, some researchers believe that AIAN may be at the brink of an epidemic. For the first time, in 1999, the estimated AIDS rate for AIAN adults exceeded that for whites. In 2002, AIAN rates of Chlamydia, gonorrhea and syphilis were higher than for whites, Hispanics and Asians. STD rates are indirect measures of the frequency of risky sexual behavior occurring within the AIAN population. There is also concern regarding an increase in HIV/AIDS among AIAN because of the proven association between alcohol or drug abuse (AOD) and high-risk sexual behaviors, and the prevalence of AOD in some AIAN communities. Although 69% of AIAN now reside within a census-defined urban area, there is a lack of data on the health status of urban AIAN. It is not clear if urban AIAN who engage in risky behaviors perceive themselves at risk for HIV. No published studies have specifically investigated perceptions of HIV risk, or the relationship between risk perception and risky behavior in an AIAN population.

This project is a secondary analysis of 218 survey respondents from the American Indian & Alaska Native HIV Testing Survey (HITS), 2001. The AIAN HITS was an anonymous cross-sectional survey of self-reported HIV testing histories and risk behaviors among urban AIAN in the Portland metropolitan area. Three categories of risk were formed based on respondents' self-reported risky

behavior. We defined 92 respondents (42%) as High-Risk (74 Moderate High-Risk and 17 Very High-Risk) and 126 respondents (58%) as Lower Risk. We then identified those respondents whose perception of their HIV risk was discordant with (did not match) their reported risk behaviors. Thirty-seven percent of Lower Risk and 50% of High-Risk respondents reported their perceived chance of HIV infection as Medium or High. Thirty-nine percent of Lower Risk and 58% of High-Risk respondents were found to have a discordant perception of their chance of infection.

Among high-risk urban AIAN, factors associated with discordant risk perception included: age, education, health insurance, history of HIV testing, knowing an AIAN person with HIV/AIDS, condom use within past year, history of drug treatment, and active IDU status. High-risk respondents who knew of any AIAN with HIV/AIDS were 6.2 times less likely to have a discordant risk perception than those who did not. Among lower risk urban AIAN, factors associated with a risk perception that did not match their self-reported risky behavior included: gender, age, history of HIV testing, alcohol use before last sex, currently in drug treatment, condom use within past year, history of attendance in a 12-step program, and cocaine use in last year. The results of this study should be used to focus and develop local HIV prevention interventions, and can give social workers, health workers and AIAN citizens a better understanding of HIV risk perceptions and factors associated with those perceptions in urban AIAN.

## **Background & Significance**

### American Indian & Alaska Native population

American Indians and Alaska Natives (AIAN) include members from more than 557 diverse federally recognized tribes [1]. According to the 2000 Census, 1.5 percent of the total U.S. population (4.1 million) reported they were AIAN [2].

This number includes 2.5 million (0.9 percent) who reported AIAN as their only race (“AIAN alone”), and 1.6 million (0.6 percent) who reported their race as AIAN plus one or more other races (“AIAN in combination”). Since the 2000 Census was the first to allow self-reporting of multiple races, the total AIAN population doubled from 1990 estimates. In Oregon, 2.5 percent or 85,667 individuals reported their race as AIAN either alone or in combination [2].

Currently, 61% (about 1.5 million) of AIAN alone and 69% (about 2.8 million) of AIAN in combination live in an urban area [3].

### AIAN-Focused Health Services

The Indian Health Service (IHS) is the agency within the Department of Health and Human Services responsible for providing federal health services to American Indians and Alaska Natives. The IHS currently provides health services to about 1.6 million AIAN who are members of federally recognized tribes in 35 states, including Oregon. The tribal members receiving IHS services live mainly on reservations and in rural communities [1].



During the 1950s the federal government began enticing Indian families living on reservations to relocate to larger cities. They were offered job training and placement, and temporary health care by the Bureau of Indian Affairs, in an effort to assimilate Indian people into mainstream American society, and terminate legal obligations to Indian tribes [4]. Over 160,000 AIAN were relocated to selected urban centers. During the 1960s urban Indian community leaders began to advocate for local, state and national culturally appropriate health programs addressing the needs of urban AIAN. Title V of the Indian Health Care Improvement Act (IHCIA) targets specific funding for the development of programs for AIAN residing in urban areas. In the 1992 amendment to the Indian Health Care Improvement Act, specific policies were included to improve the health status of urban Indians. To uphold this mission, the IHS Urban Indian Health Program now supports 34 urban health programs funded under Title V of the IHCIA [4].

About 150,000 AIAN use the urban health programs. Two-thirds of those who utilize urban Indian health programs are unable to access IHS or tribal health programs, either because they do not meet eligibility criteria, or because they reside outside of IHS and tribal service areas. Urban Indian Health Program funding is estimated at 22% of the projected need for primary care services [5]. AIAN residing in urban Indian health program service areas (UIHO) represent 24% (about 1 million) of the entire AIAN US population. Another 46% reside in census-defined urban areas which lie outside UIHO service areas [3]. From

these statistics it is clear that a majority of AIAN now live in urban areas and some of these urban AIAN are not receiving comprehensive health care through IHS services as entitled by law.

### AIAN Health Status

American Indians and Alaska Natives continue to have lower income with a higher rate of unemployment than the general population. Poverty, along with lack of access to reliable health care, are strong factors for the diminished health status of AIAN. According to the 2000 Census, 26% of the AIAN alone population live in households with incomes below poverty compared with 12.4% of the total population. The proportion of the AIAN alone population reporting not being employed (12%) was two times the national rate (6%). Using mortality records from 1990-1999 death certificates, certain causes of death were found to be much higher in AIAN compared to all races such as: chronic liver disease and cirrhosis (146% higher), and alcohol-related deaths (262% higher) [3]. Findings from 1997-2000 Behavioral Risk Factor Surveillance System data indicate that disparities still exist in health behaviors between AIAN and other racial/ethnic groups. For example, AIAN respondents were more likely to report obesity, cigarette smoking, and awareness of having diabetes, than respondents of other racial/ethnic groups [6].

Much less is known about the health status of urban AIAN for several reasons. The urban AIAN population is geographically dispersed and small compared to

the general population, and IHS does not collect, analyze or publish vital statistics or population characteristics for urban AIAN exclusively. A population-based study using vital statistics and communicable disease reports (1981-1990) to characterize the health status of urban AIAN near Seattle, WA compared their health status to urban whites and African Americans as well as to AIAN living on or near reservations [7]. Significant disparities were found between the health of urban AIAN and urban whites across almost every health dimension studied. Communicable disease rates were significantly higher among urban AIAN than among urban whites. Incidence rates of Hepatitis A and B among urban AIAN were higher than among rural AIAN, urban whites and urban African Americans. Among urban AIAN, incidence rates of chlamydia (5.16 per 1000), syphilis (0.47 per 1,000) and gonorrhea (2.98 per 1,000) were significantly higher compared with urban whites (2.56, 0.05 and 0.81 per 1,000 respectively) [7].

#### HIV/AIDS Statistics by Race

The estimated AIDS rate for AIAN adults in 2002 was 11.2 per 100,000 population as compared with 7.0 per 100,000 population for whites. Total rates for Hispanic (26.0 per 100,000) and African American (76.4 per 100,000) adults were significantly higher. The 2002 total AIDS rate (14.1 per 100,000) and AIAN AIDS rate (11.2 per 100,000) were slightly lower than for 2001 (14.9 and 11.7 per 100,000) [8,9]. The age distribution of AIDS cases among AIAN is different than in other populations. Although the numbers of AIAN AIDS cases are small, of all male AIDS cases reported through 2001, AIAN had the largest relative proportion

in the 25-29 year age group. Of all female AIDS cases reported through 2001, AIAN had the largest relative proportion in the 20-24 year age group, as compared with other races [8]. The age distribution in the AIAN population in general is younger than the U.S. population, which may explain this difference. Nonetheless, this suggests AIAN with AIDS were infected at a younger age than persons of other races with AIDS.

The AIAN distribution among HIV/AIDS exposure categories is different than in other populations. Among women in 2002 living with HIV/AIDS, AIAN had the largest relative proportion reporting exposure from injection drug use (36% compared to 26% of total adult females), and the smallest relative proportion with exposure from heterosexual contact (62% compared to 72% of total adult females). AIAN men in 2002 living with HIV/AIDS reported proportions of exposure from injection drug use (15%) and male-to-male sexual contact (60%) similar to those of total adult males [9].

In Oregon, 1% of the total population reported their race as AIAN alone during the 2000 Census, while AIAN made up 2% of newly reported HIV cases in 2002. Additionally, 2% of persons with AIDS in 2002 reported their race as AIAN. Of the 90 HIV cases in 2002 who were injection drug users, 4% reported their race as AIAN [10].

Racial misclassification in vital statistics data has been consistently identified and shown to underestimate morbidity and mortality rates of AIAN for health conditions other than HIV/AIDS [11, 12, 13, 14, 15, 16]. Based on these findings, HIV/AIDS surveillance data would likely contain some level of racial misclassification, thus underestimating the total number of AIAN infected with HIV/AIDS and HIV/AIDS incidence rates. Other sources of underestimation for AIAN include underreporting from various health clinics to states, coding errors, inclusion of insufficient numbers of AIAN to formulate conclusions, regional limitations on data collection that cannot be generalized to all AIAN in the nation, and the omission of data on AIAN in urban areas [17]. The result of these underestimates of AIAN is serious. Public health resources and funding may be allocated based on underestimated health statistics. In addition, underestimation of the HIV/AIDS disease burden in the AIAN population may lead to complacency and lower perceptions of risk among AIAN individuals themselves.

#### AIAN STD Rates

Although reported HIV/AIDS rates among American Indians and Alaska Natives continue to be relatively low, some researchers believe that the AIAN population may be at the brink of an epidemic for several reasons. In 2002, the rate of gonorrhea among AIAN was 126.8/100,000, four times higher than the rate among whites (31.1/100,000). Rates of syphilis among AIAN in 2002 were two times higher than among whites. AIAN rates for both diseases were higher than Hispanic and Asian rates but much lower than the disease rates for African

Americans. For example, in 2002 the rate of gonorrhea (per 100,000) among Hispanics was 76.0, among Asians was 24.1 while among African Americans was 742.3 [18]. These STD rates are indirect measures of the frequency of risky sexual behavior occurring within the AIAN population. Additionally, infection with certain STDs measurably increases the risk of becoming infected with or transmitting HIV [19].

### Alcohol and Drug Abuse

Alcohol and substance abuse are major health problems in some American Indian and Alaska Native communities. An association between alcohol and substance abuse and high-risk sexual behaviors has been shown repeatedly, and these behaviors have been found to co-occur in AIAN [20, 21, 22]. Binge drinking may have a direct effect on high-risk sexual contact through blacking out, poor decision-making (sex with strangers or sex with known high-risk individuals), and lack of condom use. Focused quantitative interviews on AIAN active crack and injection drug users revealed very high rates of alcohol abuse. A positive correlation was shown between alcohol use before sex and unprotected sex in this population [23].

High rates of illicit drug use have been shown among some AIAN populations [24]. According to the 2002 National Study on Drug Use and Health, an annual survey of the civilian, non-institutionalized population of the United States aged 12 years old or older, the rates of current illicit drug use were highest among

AIAN (10.1%) and persons reporting two or more races (11.4%). Rates were 9.7% for African Americans, 8.5% for whites, and 7.2% for Hispanics. Asians had the lowest rate at 3.5%. Among youths aged 12 to 17, the rate of current illicit drug use among AIAN (20.9%) was significantly higher than the rate among all youths (11.6%) [24]. The prevalence of alcohol and substance abuse among AIAN, and the capacity for this abuse to increase high-risk sexual behaviors, could lead to increased HIV transmission or rapid spread once introduced into the population. Psychological correlates for these sexual and drug-related risk behaviors include the continued history of trauma and discrimination that AIAN have endured. Additionally, physical, sexual and emotional abuse is prevalent in some AIAN communities and has been shown to be associated with drug and alcohol abuse [25]. For these reasons, AIAN are at risk for an HIV/AIDS epidemic.

### Cultural Factors

AIAN cultural beliefs affect their knowledge, attitudes and behaviors toward HIV/AIDS. One study found that among AIAN families and couples, a fatalistic attitude toward HIV/AIDS and lack of family communication about health issues, were related to less accurate HIV/AIDS knowledge [26]. Some AIAN may not believe that AIDS is a risk to their own community. Some AIAN believe that HIV is a gay-man's disease or a white-man's disease that does not affect them personally [23]. This pattern of believing AIDS primarily affects other people, people who are different from oneself, has been shown throughout the AIDS

epidemic (and in the face of other threatening disease or misfortune), with consequences of: stigmatization of the kinds of people who are commonly believed to be affected by it, denial, and lack of adoption of preventive strategies, thus continuing the disease transmission [27]. In addition, in some, more traditional AIAN communities, homosexuality is not openly accepted. This may drive some members to leave the reservations for urban areas, or, engage in risk behaviors in secret [28].

The AIAN population has a unique factor that could contribute to spread of HIV infection: the circular migration of citizens from city to reservation and back. AIAN reservations are often close-knit communities. Individuals traveling to urban areas for work or education may return to live on the reservation or visit for special ceremonies, creating a potential vector of HIV transmission to the reservation [29]. Sexual mixing among IDUs may be more prevalent in urban locations than among more isolated reservations. Among a sample of AIAN drug users, sex partner pairs composed of American Indian women and white men were found to be the least likely to use condoms and the most likely to report an IDU sex partner [30].

#### HIV Knowledge, Attitude and Behaviors

According to national risk factor surveillance data, AIAN were significantly more likely than non-AIAN to perceive their risk of HIV infection as medium or high (9.2% versus 6.7%), with variation by geographic region and gender. These



results are based on data from 36 states covered by IHS collected monthly through telephone interviews of the adult population using a random-digit-dialing recruitment methodology [6]. However, approximately 17% of AIAN households did not have a telephone in 1998 and homeless were not included in the survey [31]. A convenience sample of 100 urban AIAN were surveyed at an AIAN gathering in NYC. Results indicated that 15% of respondents reported they were at moderate or high-risk of getting HIV/AIDS while 84% reported they were at low or no risk of getting HIV/AIDS. The sample consisted mainly of heterosexual, educated AIAN women thus results have limited generalizability [32].

Some investigators have reported that AIAN knowledge levels about HIV/AIDS are rather low [25, 33] while other studies have found knowledge levels consistent with the general U.S. population [34]. Among respondents in Morrison-Beedy's study of fifty-three AIAN women, 21% did not know that a person could be infected with HIV and be asymptomatic. Some female respondents believed incorrectly that withdrawal during sexual intercourse (27%), douching (23%), or taking vitamins (21%) would protect against HIV transmission. Almost half believed they were always tested for HIV during routine Pap smears, and 38% believed a person could not become infected with HIV through oral sex [35].

### Perceived Risk and Risky Behaviors

According to the Health Belief Model [36], perceived risk is based on threat appraisal, an individual's own belief about the disease risk and severity, and theoretically is an important motivating factor to change risky health behaviors or adopt healthy preventive behaviors. More accurate knowledge of HIV risk has been positively correlated with higher levels of perceived risk and more accurate personal risk assessments [37]. However, a correlation between higher levels of perceived HIV risk and reduction in risky behaviors is not always seen [38, 39, 40]. Several studies have examined the association between perceived and actual risk in sexually transmitted diseases or HIV/AIDS in other populations. Perception of human papilloma virus (HPV) risk was found to be unrelated to actual HPV risk among female college students [41]. Using 1991 National Health Interview Survey data, Silbersiepe showed that cocaine and crack users were knowledgeable about HIV/AIDS but underestimated their risk of HIV infection [42]. It has been reported that college students' AIDS risk perceptions are not always be congruent with their self-reported sexual and drug use behavior. Students viewed their friends' AIDS risk as moderately greater than their own risk and their peers' risk even greater [43].

Two surveys measured HIV knowledge, attitudes and behaviors among AIAN young adults and women. Mitchell identified rather low HIV knowledge (on average, 54% of HIV questions were answered correctly) and attitudes (including low perceived risk) with rather high rates (59%) of inconsistent condom use (a

risky sexual behavior) among Northern Plains American Indian young adults [33]. According to the previously mentioned survey of 53 AIAN women by Morrison-Beedy, 26% reported multiple sex partners within the past year and 30% reported use of alcohol before sex. The women who did not consistently use condoms reported feeling *less* vulnerable to HIV and were *less* ready to change their risky behaviors [35].

Further investigation into factors associated with this incongruence between perceived risk and actual risk is needed. Among high-risk individuals, factors associated with discordance between perceived HIV risk and actual risk may include gaps of knowledge about the disease, or denial, the inability to acknowledge one's own risky behaviors. Among lower risk individuals, an exaggerated perception of HIV risk may lead to unnecessary panic or discrimination against people with HIV/AIDS. Few published studies have specifically investigated perceptions of HIV risk, or the relationship between risk perception and risky behavior or knowledge about HIV among AIAN. Attempting to quantify the level of discordance between perceived HIV risk and reported risky behavior among urban AIAN can inform the development of prevention strategies tailored to this population. It is important to describe individuals who have a perceived HIV risk discordant with their reported risky behavior to develop successful intervention strategies. HIV prevention education can be targeted toward high-risk AIAN who do not perceive themselves to be at risk.

### **Specific Aims**

This study will investigate the relationship between HIV risk perception and self-reported risky behaviors among urban AIAN. We will identify factors associated with discordance between perceived risk and reported risk behavior to guide intervention strategies. We hypothesize that a large proportion of survey respondents' perceived HIV risk does not agree with their reported risk status, and that certain individual characteristics as well as their HIV knowledge, attitudes and behaviors are associated with a discordant perceived risk of HIV infection.

The specific aims of this project are:

- 1) to determine the prevalence of discordance between perceived HIV risk and self-reported risky behavior in this population of urban AIAN categorized by risk level,
- 2) to evaluate differences between high-risk and lower risk urban AIAN (demographic, HIV testing, prevention and behaviors, HIV perceptions),
- 3) to characterize the individuals whose perceived HIV risk is discordant with their reported risk behaviors according to demographics, HIV knowledge, attitudes and behaviors, and
- 4) to determine which factors are associated with discordance of perceived risk and risky behavior among urban AIAN survey respondents.

This project is a secondary analysis of the American Indian & Alaska Native (AIAN) HIV Testing Survey (HITS) 2001. The AIAN HITS was an anonymous cross-sectional survey of self-reported HIV testing histories and risk behaviors among urban AIAN. A more detailed explanation of the original study follows in the Methods chapter. Urban AIAN are engaging in behaviors that put them at risk for HIV infection. Preliminary results of the AIAN HITS 2001 showed that urban AIAN are aware that they, as a group, are vulnerable to HIV infection. The main risk behaviors participants engaged in were high-risk heterosexual behavior and intravenous drug use [44].

## **Methods**

### **AIAN HIV Testing Survey**

Oregon Health & Science University (OHSU) was funded by the Centers for Disease Control and Prevention (CDC) to conduct the AIAN HITS in 2001 in collaboration with the Northwest Portland Area Indian Health Board (NPAIHB). The goal of the project was to conduct an anonymous cross-sectional survey of self-reported HIV testing history, determine reasons for delaying or avoiding testing, and assess risk behaviors among high-risk urban AIAN. The AIAN HITS 2001 was approved by the CDC, Portland Area IHS and the OHSU Institutional Review Board (IRB).

The major objectives were to obtain a representative sample of urban AIAN engaging in high-risk behavior, to survey individuals about their HIV risk behaviors, testing history, perceptions and prevention awareness, to examine the perceptions AIAN have about HIV and AIDS in this urban high-risk population, and to determine what types of behaviors urban AIAN engage in that put them at risk for HIV/AIDS.

The AIAN HITS 2001 survey consisted of 116 main questions divided into the following sections: demographics, HIV testing experiences, HIV perceptions, HIV knowledge, body piercing behavior, sexual behavior, drug use history, STD & hepatitis testing, and HIV prevention activities. Many of the questions had multiple follow-up probe questions that depended on the answer to the main question. Therefore, there were over 500 variables in the dataset before any recoding or categorization was done.

The AIAN HITS was developed by adapting the HIV Testing Survey 2000, developed by the Centers for Disease Control & Prevention (CDC), to address issues unique to urban AIAN. The CDC HITS is an anonymous cross-sectional survey initiated in nine states in 1995 that targets high-risk populations by sampling at needle-exchange programs, STD clinics and gay bars. The survey tool has been validated by the CDC. For the AIAN HITS, formative research was performed to determine how to best sample, recruit and survey urban AIAN [44].

Before the survey was administered, interviews were conducted with urban AIAN healthcare workers and community members.

Two hundred and twenty two (222) surveys were administered between early August and mid November 2001 to adult American Indians and Alaska Natives who resided in the Portland metropolitan area. Most surveys were administered at an urban Indian health clinic (n=85), and at an office in downtown Portland (n=126). These surveys were both anonymous and confidential; no respondent identifiers were collected.

Efforts were made to recruit individuals who were engaging in behaviors that put them at risk for HIV. To obtain a representative sample of urban AIAN engaging in high risk-behavior a respondent-driven sampling technique was used. Respondent-driven sampling (RDS) can be very useful when attempting to survey a hard-to-reach or “hidden” populations [45, 46]. In this study, respondents were asked to recruit up to 5 individuals in their social network by handing out small informational flyers. They were not asked to identify their peers in any way. This method supposed that AIAN members of high-risk groups would recruit others with similar HIV risk factors, and that high-risk AIAN would be more likely to participate after one of their social colleagues completed the survey and recommended participation.

Six trained interviewers administered between 10 and 78 surveys in a standard fashion, and provided a customized HIV prevention session based on each individual's responses to the survey. At the completion of the survey, respondents were given \$25 incentive payment [44].

All survey response data was transcribed from the questionnaire into a Microsoft Access database. The database was then converted to SPSS (SPSS Inc., Chicago IL) for data cleaning and analysis. Data cleaning also involved reviewing written responses to specific questions.

### Secondary Analysis of AIAN HITS

This report is a secondary analysis of the AIAN HITS data. The project was reviewed by the OHSU Institutional Review Board (IRB) and determined to meet the requirements for exemption from IRB review and approval since no identifiable patient data were collected or recorded.

### **Participants**

Of the 222 respondents who completed the AIAN HITS 2001, four respondents who reported they had tested positive for HIV were excluded from these analyses since they could not contribute to an analysis of perceived risk of HIV. The sample size for this secondary analysis is 218.



## **Data Transformation and Recoding**

Items from the Sexual Behavior and Drug Use History sections of the AIAN HITS were transformed and recoded to determine individuals' risk status. These are described in detail below.

### *Sexual Risk Behaviors*

The survey contained many questions about sexual behavior within the past year including number of primary partners and non-primary partners, males and females, and type of sex (oral, anal, vaginal). To determine total number of sexual partners of the same or opposite sex within the past year, responses to number of primary male partners, non-primary male partners, primary female partners and non-primary female partners were summed for each respondent.

### *Condom Use*

Condom use frequencies (never, less than half the time, about half the time, more than half the time, or always) were collected for different types of sex (oral, anal, vaginal) and with different types of partners. To measure overall frequency of condom use in the past year, we ascertained the number of times each respondent was asked their condom use frequency with different partner types and re-categorized. We averaged the responses to all condom frequency questions related to vaginal and anal sex to obtain overall condom use frequency for each respondent who reported sex in the past year. Inconsistent condom use was defined as not always using condoms with sex during the past year.

## Risk Group Definitions

Risk group definitions were created by review of previous HIV Risk Behavior survey definitions [47, 48, 49, 50]. Three categories of risk were formed based on respondents' self-reported risky behavior: Very High-Risk (VHR), Moderate High-Risk (MHR) and Lower Risk (LR). Our goal was to estimate "current" levels of risky behavior. However, the response examining lifetime use of injection drugs was chosen to measure high-risk drug use behavior instead of "injected drugs within last year" because investigators suspected that socially desirable responding took place. Some evidence suggests that lifetime use of injected drugs is more completely reported than very recent use [51].

We identified a small group as Very High-Risk. These respondents reported high levels of current sexual *and* drug risky behaviors. Very High-risk respondents reported multiple sexual partners within the past year with inconsistent condom use *and* reported *recent* injection drug use (within past year), *or* they reported trading sex for money or drugs within the past year. Moderate High-Risk respondents reported two or more sexual partners within the past year with inconsistent condom use *and/or* reported *ever* using injection drugs. Increased risk for HIV has been defined similarly in reports of the National AIDS Behavioral Survey, the Behavioral Risk Factor Surveillance System, the National Health Interview Survey and the National Household Survey on Drug Abuse [47, 48, 49, 50]. Respondents not meeting any of these criteria were categorized as Lower Risk.

**Definitions of discordance between perceived risk and reported risky behavior**

To fulfill the objectives of this study we identified those respondents whose perceived risk of HIV infection was discordant with (i.e., did not match) their risk status, as defined by their self-reported risk behaviors from the Sexual Behavior and Drug History sections of the survey. Survey respondents were asked, “As an AIAN, what are your chances of getting infected with HIV?” with answer choices of: High, Medium, Low, None, Don’t Know. One respondent did not answer the perceived risk question; thus the effective sample size was 217. Figure 1 pictorially displays the categories of respondents within each risk level we defined as having a discordant risk perception (grey cells indicate discordance).

**Figure 1. Definitions of discordance between perceived HIV risk and reported risky behavior**

<b>Personal chance of infection</b>	<b>Lower Risk</b>	<b>Moderate High-Risk</b>	<b>Very High-Risk</b>
None			
Low			
Medium			
High			
Don't Know			

\* grey cells indicate discordance

For the Moderate High-Risk respondents, perceived risk reported to be “Low” or “None” was considered a discordant risk perception. For the Very High-Risk respondents, any answer besides “High” to describe their chance of infection was

considered a discordant risk perception. Lower Risk respondents were considered discordant if they chose “High” or “Medium” to describe their chance of HIV infection. For all risk groups, an answer of “Don’t Know” to describe their perceived chance of infection was considered a discordant risk perception.

### **Risk Group Comparisons**

We examined the frequency and distribution of respondent characteristics by risk group (Lower Risk, Moderate High-Risk and Very High-Risk). Due to sample size constraints, Moderate High-Risk and Very High-Risk respondents were combined and presented together as High-Risk (HR) in the results section.

Continuous variables, such as age, were recoded as categorical variables for ease of interpretation. Sample sizes varied slightly for each question based on how many respondents were asked, and then answered, each question.

Pearson’s chi-square test of independence was used to determine if there were significant associations between variables studies and risk status. Significance levels are presented comparing Lower Risk to High-Risk.

### **Comparison of Discordant vs. Concordant respondents**

We examined the frequencies of perceived chance of infection according to each defined risk group and obtained the proportion of discordance of perceived HIV risk within each group. Fisher’s exact test was used when there was an expected count of less than five participants per cell, otherwise Pearson’s chi-square test was used. For subsequent analyses, Moderate High-Risk and Very

High-Risk categories were combined into High-Risk for presentation purposes. We examined the frequency and distribution of survey items stratified by discordant vs. concordant risk perception, overall and within Lower Risk and High-Risk groups separately.

### **Logistic Regression Model-building Process**

We followed well-accepted model-building procedures [52] to build two unique multiple logistic regression models, one for the lower risk and one for the high-risk respondents with discordance (yes/no) as the dependent variable. We divided the dataset into two subgroups: Lower Risk and High-Risk (comprised of moderate high-risk and very high-risk respondents). Within each subgroup, we performed simple logistic regression to measure the association of each independent survey variable with the dependent variable. The coefficients of each predictor variable were reviewed for significance (Beta, standard error of Beta, Odds Ratio, 95% Confidence Interval of OR, Deviance, G statistics and p-value). For each risk group, the variables selected to proceed to multivariate model-building were chosen based on the significance level of their univariate analysis ( $p < 0.25$ ), or based on their potential to confound the associations between other predictor variables and the outcome (gender, age, homelessness/income level). Potential survey variables for multiple logistic regression model-building are listed in Table 1 for each risk group.

Definitions of variable categories were recoded such that “no answer” was coded as “no” to retain the largest sample size. This is valid in most circumstances because a “no answer” on the survey often meant the question was not asked of the respondent, i.e. they answered “no” to a main survey item and the survey questioning then followed a designated skip-pattern. More rarely, some respondents may have chosen not to answer a question because they did not feel comfortable reporting an unhealthy behavior.

**Table 1. Potential survey variables for multiple logistic regression model-building: Association with discordance at  $p < .25$  level or potential confounder\***

High-Risk Model	Lower Risk Model
<ul style="list-style-type: none"> <li>• Gender*</li> <li>• Age*</li> <li>• Homelessness/Income level*</li> <li>• Education</li> <li>• Multiracial</li> <li>• Any Health Insurance</li> <li>• Use of IHS services</li> <li>• History of HIV testing</li> <li>• Knowledge of AIAN living with HIV</li> <li>• Knowledge of AIAN died of AIDS</li> <li>• Condom use in past year</li> <li>• Alcohol before last sex</li> <li>• Drug use before last sex</li> <li>• History of drug treatment</li> <li>• Use of speed within last year</li> </ul>	<ul style="list-style-type: none"> <li>• Gender*</li> <li>• Age*</li> <li>• Homelessness/Income level*</li> <li>• History of HIV testing</li> <li>• Tested for HIV in past year</li> <li>• Tested on regular basis</li> <li>• Condom use in past year</li> <li>• Alcohol before last sex</li> <li>• Currently in drug treatment</li> <li>• History of 12-step program</li> <li>• Use of speed within last year</li> <li>• Use of marijuana within last year</li> <li>• Use of cocaine within last year</li> <li>• &gt;3 drinks within last year</li> <li>• History of drug use</li> </ul>

Several variables such as, alcohol before last sex and drug use before last sex, and knowledge of AIAN living with HIV and knowledge of AIAN died of AIDS, were combined and re-analyzed. Variables measuring similar concepts such as,

lifetime history of HIV testing, tested in last year, and tested on regular basis, were examined and the one most strongly associated with discordance was chosen for multiple logistic regression modeling. Each model was manually built by entering and removing candidate variables one at a time; levels of significance to enter a variable of 0.15 and to remove a variable of 0.20 were used.

Demographic variables (age, gender, income) were forced into the models one at a time to assess for confounding effects on the other independent variables. To validate preliminary model choices, automated forward selection and backward elimination model-building strategies were also used. Additional variables of interest (such as hepatitis diagnosis, receipt of prevention messages, binge drinking, current IDU) were individually forced into each of the final models to assess their individual effects. The Hosmer and Lemeshow Goodness of Fit Test was used to assess model fit [52]. Parameter estimates from models for the High Risk and Lower Risk subgroups were summarized as forest plots detailing each predictor variables' odds ratio and 95% confidence intervals compared to their referent group.

Statistical analyses were performed using SPSS Graduate Pack 10.0 software (SPSS Inc., Chicago, IL).

## Results

### Aim #1: Discordance between perceived risk and self-reported risky behavior

Ninety-two respondents (42%) were classified as High-Risk (75 Moderate High-Risk and 17 Very High-Risk) according to their reported behaviors. The remaining 126 respondents (58%) did not report any of the defined high-risk sex or drug behaviors and were categorized as Lower Risk. Table 2 displays the results of perceived chance of acquiring HIV infection according to our defined risk groups for 217 respondents. Six respondents (3 LR, 2 MHR, 1 VHR) were not able to estimate their chance of HIV infection (i.e. answered "don't know"). Ninety-one survey respondents (42%) defined their risk of HIV infection as Medium/High. Twenty two percent of respondents stated they had no chance of being infected with HIV. One respondent did not answer the perceived risk survey question and was not included in further analyses.

**Table 2. Perceived Risk of HIV Infection by risk groups in AIAN HITS 2001.**

	Lower Risk 126	Moderate High- Risk 74	Very High- Risk 17	Total 217
<b>Chance of getting infected with HIV</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>
None	34 (27.0%)	13 (17.6%)	1 (5.9%)	48 (22.1%)
Low	43 (34.1%)	27 (36.5%)	2 (11.8%)	72 (33.2%)
Medium	34 (27.0%)	20 (27.0%)	7 (41.2%)	61 (28.1%)
High	12 (9.5%)	12 (16.2%)	6 (35.3%)	30 (13.8%)
Don't Know	3 (2.4%)	2 (2.7%)	1 (5.9%)	6 (2.8%)

\*Discordant cells are shown in grey

\*1 Moderate High-Risk respondent did not answer perceived risk survey question



Thirty-seven percent of Lower Risk, 43% of Moderate High-Risk and 77% of Very High-Risk reported their personal chance of HIV infection as Medium or High.

**Table 3. Discordant Perceived HIV Risk by risk groups in AIAN HITS 2001**

	<b>Lower Risk N (%)</b>	<b>Moderate High-Risk N (%)</b>	<b>Very High-Risk N (%)</b>	<b>p-value</b>
Concordant perception of risk	77 (61.1%)	32 (43.2%)	6 (35.3%)	0.02
Discordant perception of risk	49 (38.9%)	42 (56.8%)	11 (64.7%)	

Table 3 shows the proportions of respondents in each risk group whose perceived risk agreed (concordant) or disagreed (discordant) with their reported risk behaviors. Sixty-five percent of VHR, 57% of MHR and 39% of LR had a risk perception discordant with their reported behaviors. High-Risk (Moderate High-Risk and Very High-Risk combined) were significantly more likely than Lower Risk to have a discordant risk perception, one that did not match their self-reported risk behaviors (58% of HR vs. 39% of LR).

**Aim #2: Characteristics of Risk Groups**

**Demographics**

More than half (56%) of all survey respondents were female. Only 38% of all survey respondents were currently employed, however, 86% of respondents had some type of health insurance. Most respondents had lived in Portland for less than two years (67%) while only 7% had resided in Portland for 5 or more years. Only six respondents reported their sexual orientation as homosexual and 12 reported themselves as bisexual, two-spirit (an AIAN individual possessing both

masculine and feminine energies) or other (92% overall reported sexual orientation of heterosexual). Of the 92 respondents defined as High-Risk, 37% reported high-risk sex only (sex with multiple partners during the past year with inconsistent condom use), 37% reported high-risk drug use only (ever engaged in injection drug use), while 26% reported both high-risk sex and drug behaviors.

Table 4 illustrates the differences in demographic characteristics between risk groups. High-Risk were more likely than Lower Risk to be homeless, living in a hotel or rooming house, or in a mission or shelter (29% vs. 13%) and to report a household income of less than \$1,000 per month (80% vs. 60%). High-Risk were also more likely to have Oregon Health Plan insurance (72% vs. 48%) and to report themselves as other races in addition to AIAN (23% vs. 11%). Although the Lower Risk respondents were more likely to be female (62%), the Very High-Risk subgroup was 77% female (data not shown in table).

**Table 4. Demographic characteristics by Risk Group in AIAN HITS 2001**

Characteristic	Lower Risk	High-Risk**	p-value
<b>Number of respondents*</b>	126	92	
	<b>N (%)</b>	<b>N (%)</b>	
<b>Interview Site:</b>			
Downtown	65 (51.6%)	61 (66.3%)	<b>0.03</b>
Urban Indian Health facility	61 (48.4%)	31 (33.7%)	
<b>Gender:</b>			
Male	48 (38.1%)	47 (51.1%)	0.06
Female	78 (61.9%)	45 (48.9%)	
<b>Age:</b>			
18-24	31 (24.6%)	16 (17.4%)	<b>0.02</b>
25-29	24 (19.0%)	8 (8.7%)	
30-39	23 (18.3%)	22 (23.9%)	
40-49	29 (23.0%)	36 (39.1%)	
>=50	19 (15.1%)	10 (10.9%)	
<b>Household Income/homelessness:</b>			
Homeless+	12 (9.5%)	18 (19.6%)	<b>0.004</b>
<\$1000/month	65 (51.6%)	56 (60.9%)	
>\$1000/month	49 (38.9%)	18 (19.6%)	
<b>Education:</b>			
<HS grad	37 (29.4%)	27 (29.3%)	1.00
HS grad or more	89 (70.6%)	65 (70.7%)	
<b>Health Insurance:</b>			
Any	110 (88.0%)	77 (83.7%)	0.36
IHS	49 (38.9%)	41 (44.6%)	0.40
OHP	61 (48.4%)	66 (71.7%)	<b>&lt;0.001</b>
Medicare	4 (3.2%)	2 (2.2%)	0.66
VA	5 (4.0%)	2 (2.2%)	0.46
Private/HMO	16 (12.7%)	4 (4.3%)	<b>0.04</b>
<b>Employment:</b>			
Currently employed	54 (43.2%)	26 (29.5%)	<b>0.04</b>
<b>Years in Portland:</b>			
<1 year	51 (40.5%)	36 (39.6%)	0.45
1-2 years	36 (28.6%)	22 (24.2%)	
2-5 years	28 (22.2%)	28 (30.8%)	
>=5 years	11 (8.7%)	5 (5.5%)	
<b>Race other than AIAN:</b>			
Multiracial	14 (11.1%)	21 (22.8%)	<b>0.02</b>
<b>Sexual orientation:</b>			
Heterosexual	119 (94.4%)	81 (88.0%)	0.19
Homosexual	3 (2.4%)	3 (3.3%)	
Bisexual, two-spirit or other	4 (3.2%)	8 (8.7%)	

\* Sample sizes vary slightly based on how many respondents answered question

\*\* High-Risk group consists of 75 MHR and 17 VHR

+ Homeless defined as living on street, or in hotel, rooming house, mission or shelter. All homeless respondents reported incomes of <\$1000 per month

Lower Risk respondents were more likely than High-Risk to be interviewed at the urban Indian Health facility versus the downtown office (48% vs. 34% of HR), to be female (62% vs. 49%), to be under 30 years old (44% vs. 26%), to be employed (43% vs. 30%) and to report having private/HMO health insurance (13% vs. 4%). However, there was no difference in proportion with a high school education or higher between the two risk groups.

### **HIV testing, prevention and risk behaviors**

In total, 83% of respondents had reported at least one HIV test in their lifetime. Eighty-one percent of all respondents reported receiving prevention messages in the past year. More than one third of all respondents reported knowing an AIAN with HIV/AIDS (37%). Relatively few had heard of alternative testing methods such as the home collection kit (27%), the oral HIV test (19%) and the rapid test (11%) or post-exposure prophylaxis (11%). More than half of all respondents had received free condoms in the past 12 months (58%). However, of the 155 respondents who reported having sex within the last year, only 12% reported they always used condoms while 56% reported they never used condoms. Ten respondents reported trading sex for money or drugs within the past year, included by definition in the Very High-Risk subgroup.

Sixty-seven percent of the survey population reported drinking alcohol during the past year and 61% reported having used illicit drugs during their lifetime. Forty-seven percent of respondents had been in a drug treatment program at some

point during their lifetime, while 45% had been in a twelve-step program. In total, 55 respondents (25%) reported ever using injection drugs (all, by definition, categorized as High-Risk). Twenty of those (36%) said they injected drugs in the past year.

Table 5 illustrates the differences in HIV testing practices between risk groups. High-Risk respondents were significantly more likely to have been tested for HIV than Lower Risk respondents (90% vs. 78%). Of those tested for HIV, those in the High-Risk group were significantly more likely to have been tested multiple times and within the past year. Significantly more of the High-Risk group reported getting tested because they “might have been exposed through drugs”. This represents an internal validation of the risk group definitions. About half of those tested had been tested because of possible HIV exposure through sex (44% of Lower Risk respondents and 51% of High-Risk respondents). About one-quarter of those tested were required to for military, jail or alcohol or drug treatment programs (21% of Lower Risk respondents and 31% of High-Risk respondents).

**Table 5. HIV Testing Practices by Risk Group in AIAN HITS 2001**

Characteristic	Lower Risk	High-Risk**	p-value
<b>Number of respondents*</b>	126	92	
	<b>N (%)</b>	<b>N (%)</b>	
<b>Ever been tested for HIV:</b>			
Yes	97(77.6%)	83 (90.2%)	<b>0.02</b>
<b>Of those tested, how many times?</b>			
Once	37 (38.5%)	13 (15.9%)	<b>0.001</b>
2-3 times	38 (39.6%)	35 (42.7%)	
4+ times	21 (21.9%)	34 (41.5%)	
<b>Of those tested, in past 12 months?</b>			
Yes	33 (34.4%)	46 (56.8%)	<b>0.003</b>
<b>Of those tested, on regular basis?</b>			
Yes	31 (34.4%)	32 (41.6%)	0.34
<b>Reasons for getting tested anytime in past***</b>			
Doctor suggested it	37 (38.1%)	31 (37.3%)	0.91
Someone else suggested it	26 (26.8%)	33 (39.8%)	0.07
Partner told you he/she was HIV+	4 (4.1%)	5 (6.0%)	0.74
Might have been exposed through sex	43 (44.3%)	42 (50.6%)	0.40
Might have been exposed through drugs	6 (6.2%)	33 (39.8%)	<b>&lt;0.001</b>
Health problem that might be from HIV	9 (9.3%)	7 (8.4%)	0.84
Concerned you could give HIV to someone	29 (30.2%)	33 (39.8%)	0.18
Wanted to know where you stood	83 (85.6)	71 (85.5%)	1.00
Wanted to get medical care if you had HIV	62 (63.9%)	59 (71.1%)	0.31
You or your partner was pregnant or planning pregnancy	26 (26.8%)	13 (15.7%)	0.07
A sexual partner wanted you to	9 (9.4%)	15 (18.1%)	0.09
Part of an STD or routine medical check-up	56 (57.7%)	45 (54.2%)	0.64
Had to for military, jail, alcohol or drug treatment	20 (20.8%)	26 (31.3%)	0.11
<b>Where tested last</b>			
Medical/counseling site	46 (47.4%)	32 (38.6%)	0.45
AIAN facility	34 (35.1%)	31 (37.3%)	
Jail/ drug treatment program	6 (6.2%)	10 (12.0%)	
Other	11 (11.3%)	10 (12.0%)	

\* Sample sizes vary slightly based on how many respondents answered question

\*\* High-Risk group consists of 75 MHR and 17 VHR

\*\*\* Percentages in each risk group add up to greater than 100 because respondents could report multiple reasons

**Table 6. Sexual Behavior and STD Testing by Risk Group in AIAN HITS**

2001

Characteristic	Lower Risk	High-Risk	p-value
<b>Number of respondents</b>	126	92	
	<b>N (%)</b>	<b>N (%)</b>	
<b>Condom use with sex within last year (N=155)</b>			
Never	44 (55.0%)	42 (56.0%)	<b>0.005</b>
Some of the time	20 (25.0%)	30 (40.0%)	
Always	16 (20.0%)	3 (4.0%)	
<b>Number of sex partners within last year</b>			
5 or more partners	2 (1.6%)	18 (19.6%)	<b>&lt;0.001</b>
Less than 5 partners	124 (98.4%)	74 (80.4%)	
<b>Age at first sex with condom (N=212)</b>			
Median (Min-Max)	17 (9-46)	19 (13-47)	0.82
<=17 years	68 (56.2%)	49 (53.8%)	
>=18 years	42 (34.7%)	30 (33.0%)	
Never had sex with a condom	6 (5.0%)	7 (7.7%)	
Don't Know	5 (4.1%)	5 (5.5%)	
<b>Age at first sex without condom (N=216)</b>			
Median (Min-Max)	17 (12-40)	15 (3-24)	<b>&lt;0.001</b>
<=17 years	65 (52.4%)	74 (80.4%)	
>= 18 years	51 (41.1%)	18 (19.6%)	
Never had sex without a condom	4 (3.2%)	0 (0%)	
Don't Know	4 (3.2%)	0 (0%)	
<b>Alcohol use before last sex</b>	16 (12.7%)	46 (50.0%)	<b>&lt;0.001</b>
<b>Drug use before last sex</b>	5 (4.0%)	27 (29.3%)	<b>&lt;0.001</b>
<b>Traded sex for money or drugs in past year</b>	0 (0%)	10 (10.9%)	
<b>STD Testing</b>			
Ever had an STD test	88 (70.4%)	75 (81.5%)	<b>0.01</b>
STD test in last year	31 (24.6%)	42 (45.7%)	<b>0.001</b>

\* Sample sizes vary slightly based on how many respondents answered question

\*\* High-Risk group consists of 75 MHR and 17 VHR

Table 6 illustrates the differences in sexual behaviors associated with transmission of HIV infections between the risk groups. Twenty-seven percent (27%) of the High-Risk group reported four or more sexual partners within the past year. A significantly higher proportion of the High-Risk group stated they were 17 or younger the first time they had sex without a condom. Of all sexually

active respondents, significantly fewer High-Risk respondents reported always using condoms compared with Lower Risk (4% vs. 20%). The High-Risk respondents were significantly more likely to report drinking alcohol (50% vs. 13%) or using drugs (29% vs. 4%) before last sexual encounter. Thirty-seven percent of Lower Risk and 18% of High-Risk did not report engaging in sex during the past year. High-Risk respondents were also significantly more likely to report ever having an STD test (82% vs. 70%) and to have had an STD test within past year (46% vs. 25%).

Table 7 illustrates the differences in reported drug use between risk groups. High-Risk respondents were significantly more likely to have ever been in drug treatment (62% vs. 38%) or a twelve-step program (59% vs. 39%) and to currently be in a drug treatment program (30% vs. 14%). High-Risk respondents were also significantly more likely to report acquiring Hepatitis (46% vs. 10%).

A subgroup analysis of the Very High-Risk group was performed to evaluate differences in their HIV knowledge and receipt of prevention messages versus all other respondents. Very High-Risk respondents were significantly *less* likely to report receiving prevention messages than the rest ( $p=0.01$ ). They were also significantly more likely to report knowing an AIAN with HIV compared to the others (data not shown in table).



**Table 7. Drug and Alcohol Use by Risk Group in AIAN HITS 2001**

Characteristic	Lower Risk	High-Risk**	p-value
Number of respondents*	126	92	
	N (%)	N (%)	
<b>Alcohol/drug treatment</b>			
Ever been in drug treatment program	46 (37.7%)	57 (62.0%)	<0.001
Currently in drug treatment program	17 (13.5%)	28 (30.4%)	0.002
Ever been in twelve step program	45 (38.8%)	53 (58.9%)	0.003
Currently in twelve step program	23 (18.3%)	24 (26.1%)	0.17
<b>Hepatitis</b>	11 (9.7%)	41 (45.6%)	<0.001
<b>Alcohol use</b>			
3+ drinks in one day within last year?	76 (60.3%)	71 (77.2%)	0.01
3-5 drinks in one day within last year? (N=147)			
Never	2 (2.7%)	0 (0%)	0.04
Less than weekly	34 (45.3%)	21 (29.6%)	
Weekly or more	39 (52.0%)	50 (70.4%)	
6-10 drinks in one day within last year?			
Never	18 (24.3%)	12 (17.1%)	0.19
Less than weekly	29 (39.2%)	22 (31.4%)	
Weekly or more	27 (36.5%)	36 (51.4%)	
11+ drinks in one day within last year?			
Never	37 (50.0%)	18 (25.4%)	0.01
Less than weekly	16 (21.6%)	25 (35.2%)	
Weekly or more	21 (28.4%)	28 (39.4%)	
<b>Drug use</b>			
Ever used drugs to get high?	57 (45.6%)	75 (81.5%)	<0.001
Of those who answered yes (N=118):			
Frequencies of specific drug use in past year***			
Amphetamines, meth, speed, crank			
Never	38 (74.5%)	33 (49.3%)	0.005
Less than weekly	10 (19.6%)	24 (35.8%)	
1-6 days per week	2 (3.9%)	8 (11.9%)	
Daily	1 (2.0%)	2 (3.0%)	
Crack			
Never	43 (84.3%)	41 (61.2%)	0.006
Less than weekly	7 (13.7%)	20 (29.9%)	
1-6 days per week	1 (2.0%)	10 (14.9%)	
Daily	0 (0%)	3 (4.5%)	
Cocaine			
Never	35 (68.6%)	33 (49.3%)	0.035
Less than weekly	14 (27.5%)	24 (35.8%)	
1-6 days per week	2 (3.9%)	5 (7.5%)	
Daily	0 (0%)	5 (7.5%)	

**Table 7. Drug and Alcohol Use by Risk Group in AIAN HITS 2001 continued**

Characteristic	Lower Risk	High-Risk**	p-value
<b>Number of respondents*</b>	126	92	
	<b>N (%)</b>	<b>N (%)</b>	
Downers			<b>0.05</b>
Never	49 (96.1%)	57 (85.1%)	
Less than weekly	2 (3.9%)	5 (7.5%)	
1-6 days per week	0 (0%)	3 (4.5%)	
Daily	0 (0%)	2 (3.0%)	
Heroin (smoked, snorted)			<b>&lt;0.001</b>
Never	51 (100%)	49 (76.6%)	
Less than weekly	0 (0%)	10 (15.6%)	
Daily	0 (0%)	5 (7.8%)	
Marijuana			0.64
Never	22 (40.7%)	26 (36.6%)	
Less than weekly	23 (42.6%)	23 (32.4%)	
1-6 days per week	8 (14.8%)	12 (16.9%)	
Daily	1 (1.9%)	10 (14.1%)	
<b>Ever injected drugs?</b>	0 (0%)	58 (63.0%)	
<b>Injected drugs in last year?</b>	0 (0%)	20 (21.7%)	

\* Sample sizes vary slightly based on how many respondents answered question

\*\* High-Risk group consists of 75 MHR and 17 VHR

\*\*\*p-values compare Ever vs. Never Use during past year

### **HIV-Related Knowledge and Attitudes**

Table 8 illustrates the differences in agreement with twenty HIV perception statements between high-risk and lower risk respondents. In total, 23 respondents (11%) agreed that, "Sometimes you do things where you might get HIV because HIV is a white man's disease" while 14 respondents (6%) did not believe that HIV could be spread through heterosexual sex (no differences by risk group). Eighty-six percent of respondents stated that they would be comfortable going to a tribal or urban Indian health center for an HIV test.

**Table 8: HIV Knowledge and Attitudes by Risk Group in AIAN HITS 2001**

Characteristic	Lower Risk	High-Risk**	p-value
Number of respondents*	126	92	
	N (%)	N (%)	
<b>HIV Knowledge and Attitudes (% of Agreement)</b>			
If you have HIV but feel well, medical care can help you live longer and healthier	99 (78.6%)	78 (84.8%)	0.25
Having AIDS/HIV is a death sentence	81 (64.3%)	54 (58.7%)	0.40
Sex partners want to know if you've had HIV test	59 (47.2%)	50 (54.9%)	0.26
Many of your friends have gotten the HIV test	57 (45.6%)	44 (48.4%)	0.69
Less concerned about getting HIV than 5 yrs ago	58 (46.8%)	52 (56.5%)	0.16
Less careful about being safe with sex or drugs than 5 years ago	36 (28.8%)	17 (18.7%)	0.09
By taking new HIV drug therapies people HIV+ decrease the chances of infecting their partner	39 (31.0%)	29 (32.2%)	0.84
Oral sex without a condom is safe if no ejaculation	7 (5.6%)	9 (9.9%)	0.23
Anal or vaginal sex without a condom is safe if no ejaculation	9 (7.1%)	8 (8.7%)	0.67
Sometimes you do things where you might get HIV such as not using condoms or not cleaning needles	59 (46.8%)	62 (67.4%)	<b>0.003</b>
Sometimes you do things where you might get HIV because HIV is a gay man's disease	10 (7.9%)	6 (6.5%)	0.69
Sometimes you do things where you might get HIV because HIV is a white man's disease	13 (10.3%)	10 (10.9%)	0.90
You never think about getting HIV	42 (33.6%)	33 (36.3%)	0.69
You are burned out thinking about HIV	31 (24.6%)	29 (31.5%)	0.26
People are less careful about avoiding HIV today because they are tired of being safe	45 (35.7%)	23 (25.0%)	0.09
You often tune out messages about HIV	27 (21.6%)	27 (29.7%)	0.18
HIV can be spread through heterosexual sex	117 (92.9%)	87 (94.6%)	0.61
You would be comfortable going to a tribal or urban Indian health center for an HIV test	110 (87.3%)	77 (83.7%)	0.45
If you were to get an HIV test, you would list your ethnicity as AIAN	115 (92.0%)	84 (91.3%)	0.85
You would be comfortable dating someone with HIV	23 (18.3%)	25 (27.2%)	0.12

\* Sample sizes vary slightly based on how many respondents answered question

\*\* High-Risk group consists of 75 MHR and 17 VHR

High-Risk respondents were significantly more likely than Lower Risk to agree with the statement, "Sometimes you do things where you might get HIV such as not using condoms or not cleaning needles". This finding validates our definition

of high-risk respondents. Lower Risk were more likely to agree that they are “less careful about being safe than five years ago” and that “people are less careful about avoiding HIV today because they are tired of being safe” compared with High-Risk.

Aim #3: Comparison of respondents with discordant vs. concordant risk perception

In total, 102 respondents (47%) were categorized as having a discordant risk perception. Tables 9 and 10 display the association between explanatory variables and discordant risk perception among High-Risk and Lower Risk respondents respectively. Measures of the association between independent survey items and the outcome of discordance (Odds Ratios, 95% confidence intervals and p-values) are presented for each risk group separately.

Appendix I presents the distribution of demographic characteristics, HIV testing, prevention and behaviors, and HIV perceptions according to discordance of perceived risk vs. reported risky behavior, and stratified by risk group among 217 AIAN respondents.

Among all respondents (lower risk and high-risk combined), those with discordant risk perception were significantly more likely to be homeless or poor (78% vs. 62%), to have ever been tested for HIV (90% vs. 60%), to report ever being in a twelve-step program (54% vs. 37%), to have had hepatitis (29% vs. 18%), and to have ever used drugs (68% vs. 54%). Those with discordant risk perception

were also more likely to report that many of their friends had received an HIV test (56% vs. 38%).

**Table 9. High-Risk: Variables associated with Discordant Risk Perception**

Variable	OR	95% CI (OR)	p*
<b>Gender</b>			
Female vs. Male	1.07	0.47-2.46	0.87
<b>Age</b>			
18-24	1.00		0.86
25-29	0.88	0.16-4.87	
30-39	1.53	0.40-5.80	
40-49	1.09	0.33-3.67	
>=50	2.04	0.38-11.07	
<b>Income</b>			
Homeless	1.00		0.37
<\$1000/month	0.75	0.25-2.30	
>\$1000/month	0.40	0.10-1.54	
<b>Education (HS grad vs. not)</b>	0.37	0.14-1.00	<b>0.04</b>
<b>Multiracial (vs. AIAN only)</b>	2.11	0.73-6.06	0.16
<b>Any health insurance (yes/no)</b>	0.29	0.08-1.12	<b>0.05</b>
<b>Receive IHS health services (yes/no)</b>	0.28	0.12-0.66	<b>0.003</b>
<b>Lifetime HIV testing (ever/never)</b>	5.76	1.12-29.50	<b>0.02</b>
<b>Know AIAN living with HIV (yes/no)</b>	0.54	0.23-1.28	0.16
<b>Know AIAN died of AIDS (yes/no)</b>	0.60	0.25-1.42	0.24
<b>Condom use in past year (ever/never)</b>	1.75	0.67-4.45	0.24
<b>Alcohol use before last sex (yes/no)</b>	0.50	0.21-1.17	0.11
<b>Drug use before last sex (yes/no)</b>	0.45	0.18-1.12	0.08
<b>Lifetime history of drug treatment (yes/no)</b>	0.45	0.18-1.11	0.08
<b>Used methamphetamine in past year (yes/no)</b>	0.36	0.15-0.87	<b>0.02</b>
<b>Used marijuana in past year (yes/no)</b>	0.62	0.27-1.44	0.26
<b>Sex partners want to know if tested (agree/disagree)</b>	1.79	0.77-4.19	0.18
<b>Many friends have been tested (agree/disagree)</b>	1.60	0.69-3.73	0.27
<b>New drugs can decrease infectivity (agree/disagree)</b>	1.82	0.71-4.64	0.20
<b>Sex w/o condom is safe if no ejaculation (agree/disagree)</b>	0.21	0.04-1.10	<b>0.05</b>
<b>Partake in risky behaviors like not using condoms or not cleaning needles (agree/disagree)</b>	1.65	0.68-4.00	0.27
<b>Partake in risky behaviors because HIV is a White Man's Disease (agree/disagree)</b>	0.27	0.06-1.11	0.06
<b>People are less careful about avoiding HIV today because tired of being safe (agree/disagree)</b>	1.75	0.63-4.82	0.27
<b>You often tune out HIV Messages (agree/disagree)</b>	0.57	0.23-1.42	0.23

\* Variables of potential significance in bold, marginally significant at p<0.25 in italics, statistically significant at p<0.05 in bold and italics

Within the High-Risk group, respondents with a high school degree or higher were significantly less likely to be discordant in their risk perception (i.e., to underestimate compared to their reported risky behaviors) than those without a high school degree (OR=0.37, 95% CI=0.14-1.00). The HR respondents who reported receiving health services through IHS were also significantly less likely to have a discordant risk perception (OR=0.28, 95% CI=0.12-0.66). Those who had ever been tested for HIV were significantly more likely to be discordant (OR=5.76, 95% CI=1.12-29.50) than those who had never been tested. High-Risk respondents who reported using alcohol or drugs before last sex were significantly less likely to be discordant in their risk perception. Those who reported using methamphetamine within the past year were significantly less likely to have a discordant risk perception compared to those who did not report using methamphetamine. The five HR respondents who did not believe HIV could be spread through heterosexual sex were all discordant in their perceived risk. Those who had ever been in a drug treatment program were less likely to have a discordant risk perception (OR=0.45, 95% CI=0.18-1.11) compared to those who had never participated in a drug treatment program.

Crude associations between gender, age and income level versus discordant risk perception were not significant for High-Risk respondents. No significant difference in proportion of discordance was found between HR respondents who had received HIV prevention messages within the past year or who had received free condoms in the past year versus those that did not. Knowledge of an AIAN

living with HIV and knowledge of an AIAN who died of AIDS were negatively associated with a discordant perceived risk. No association between previous hepatitis diagnosis and discordant risk perception was found.

**Table 10. Lower Risk: Variables associated with Discordant Risk Perception**

Variable	OR	95% CI (OR)	p*
<b>Gender</b>			
Female vs. Male	1.7	0.80-3.62	<i>0.17</i>
<b>Age</b>			
18-24	1.00		<i>0.15</i>
25-29	1.03	0.40-3.00	
30-39	1.11	0.38-3.28	
40-49	0.64	0.23-1.81	
>=50	0.23	0.06-0.94	
<b>Income</b>			
Homeless	1.00		<i>0.22</i>
<\$1000/month	1.71	0.47-6.26	
>\$1000/month	0.88	0.23-3.39	
<b>Education (HS grad vs. not)</b>	1.07	0.48-2.34	0.88
<b>Multiracial (vs. AIAN only)</b>	0.86	0.27-2.73	0.80
<b>Any health insurance (yes/no)</b>	1.83	0.55-6.13	0.31
<b>Lifetime HIV testing (ever/never)</b>	1.83	0.73-4.56	<i>0.18</i>
<b>Tested in past year (yes/no)</b>	2.40	1.07-5.39	<b>0.03</b>
<b>Tested on regular basis (yes/no)</b>	1.68	0.74-3.82	<i>0.22</i>
<b>Prevention messages in past year (yes/no)</b>	0.84	0.35-2.01	0.69
<b>Received free condoms in past year (yes/no)</b>	1.05	0.51-2.16	0.90
<b>Know AIAN with HIV/AIDS (yes/no)</b>	1.03	0.50-2.12	0.94
<b>Condom use in past year (ever/never)</b>	3.33	1.31-8.48	<b>0.01</b>
<b>Alcohol use before last sex (yes/no)</b>	4.17	1.35-12.87	<b>0.01</b>
<b>Currently in drug treatment (yes/no)</b>	0.44	0.13-1.43	<i>0.15</i>
<b>Lifetime history of 12-step program (yes/no)</b>	1.71	0.80-3.68	<i>0.17</i>
<b>Used cocaine in past year (yes/no)</b>	3.03	1.03-8.98	<b>0.04</b>
<b>Used marijuana in past year (yes/no)</b>	2.20	0.97-4.96	<b>0.06</b>
<b>Used alcohol in past year (yes/no)</b>	1.89	0.89-4.02	<i>0.09</i>
<b>Ever used illicit drugs (yes/no)</b>	1.75	0.85-3.63	<i>0.13</i>
<b>Many friends have been tested (agree/disagree)</b>	2.49	1.19-5.19	<b>0.01</b>
<b>Never think about getting HIV (agree/disagree)</b>	0.42	0.19-0.95	<b>0.03</b>

\* Variables of potential significance in bold, marginally significant at  $p < 0.25$  in italics, statistically significant at  $p < 0.05$  in bold and italics

Within the Lower Risk (LR) group, respondents who had been tested for HIV within the last year were significantly more likely to be discordant in their risk perception (i.e., to overestimate compared to their reported risky behaviors) than those who had not (Odds Ratio=2.40, 95% CI=1.07-5.39). Lower Risk respondents who reported using cocaine or marijuana within the past year were significantly more likely to be discordant than those who did not. All six Lower Risk respondents who reported ever getting tested because they might have been exposed through drugs also fit the definition of discordant perceived risk. Among Lower Risk who had been tested, those stating they were ever tested because they “wanted to get medical care if they had HIV” or as part of an STD or routine medical check-up, were more likely to be discordant. Lower Risk respondents who reported using a condom any time within the last year were significantly more likely to have a discordant risk perception compared to those who did not report any condom use. Lower Risk respondents who used alcohol before last sex were also more likely to be discordant (OR=4.17, 95% CI=1.35-12.87).

Crude associations between gender, age and income level versus discordant risk perception were not found for Lower Risk respondents. No significant difference in proportion of discordance was found between Lower Risk respondents who had received HIV prevention messages within the past year, who had received free condoms in the past year, with knowledge of an AIAN living with HIV or an AIAN who died of AIDS versus those that did not.



LR respondents who agreed that many of their friends had received the HIV test were significantly more likely to have a discordant risk perception compared to those who disagreed with this statement (OR=2.49, 95% CI=1.19-5.19). LR respondents who stated that they never think about getting HIV were significantly less likely to have a discordant risk perception (OR=0.42, 95% CI=0.19-0.95).

Aim #4: Modeling of factors associated with discordance of risk perception vs. reported risky behaviors

### **High-Risk Multiple Logistic Regression**

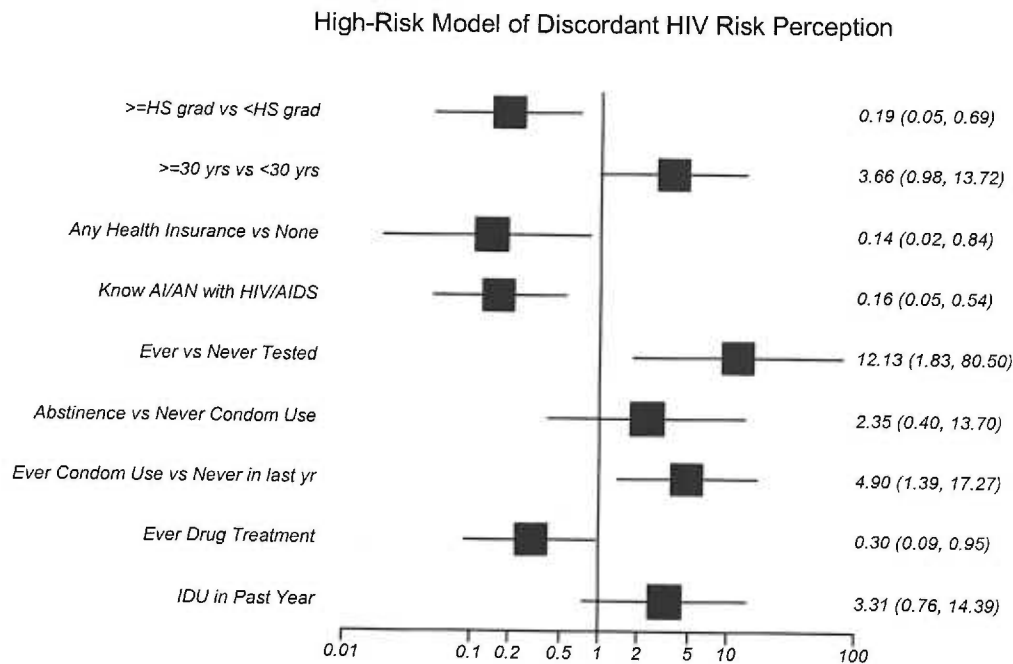
The final multiple logistic regression model describing factors associated with discordance among HR respondents is displayed as a forest plot in Figure 2. Older age ( $\geq 30$  years), a history of ever testing for HIV, use of condoms at any time in the past year, and injection drug use in the past year, were positively associated with a discordant risk perception (i.e., an underestimation compared to reported risky behaviors). Higher education (high school degree or above), possession of health insurance, knowledge of an AIAN with HIV or AIDS, and a history of participating in a drug treatment program, were negatively associated with a discordant risk perception.

After adjusting for all other variables in the model, those High-Risk with knowledge of an AIAN with HIV/AIDS were 6.2 times less likely to have a discordant risk perception compared with those who did not know an AIAN with HIV/AIDS ( $1/\text{OR for discordance in Figure 2} = 1/0.16 = 6.2$ ). High-Risk

respondents with a high school degree were 5.3 times less likely to have a discordant risk perception compared to those with less than a high school education ( $1/0.19 = 5.3$ ).

Those respondents who had ever participated in a drug treatment program were 3.4 times less likely to be discordant compared to those who had never attended a drug treatment program. However, the HR respondents over 30 years were 3.7 times more likely to have a discordant risk perception compared to those 30 years or younger. High-Risk respondents who had ever been tested for HIV were 12.1 times more likely to have a discordant risk perception compared to those never tested for HIV. Active injection drug users were over three times more likely to have a discordant risk perception than other high-risk individuals.

**Figure 2.**

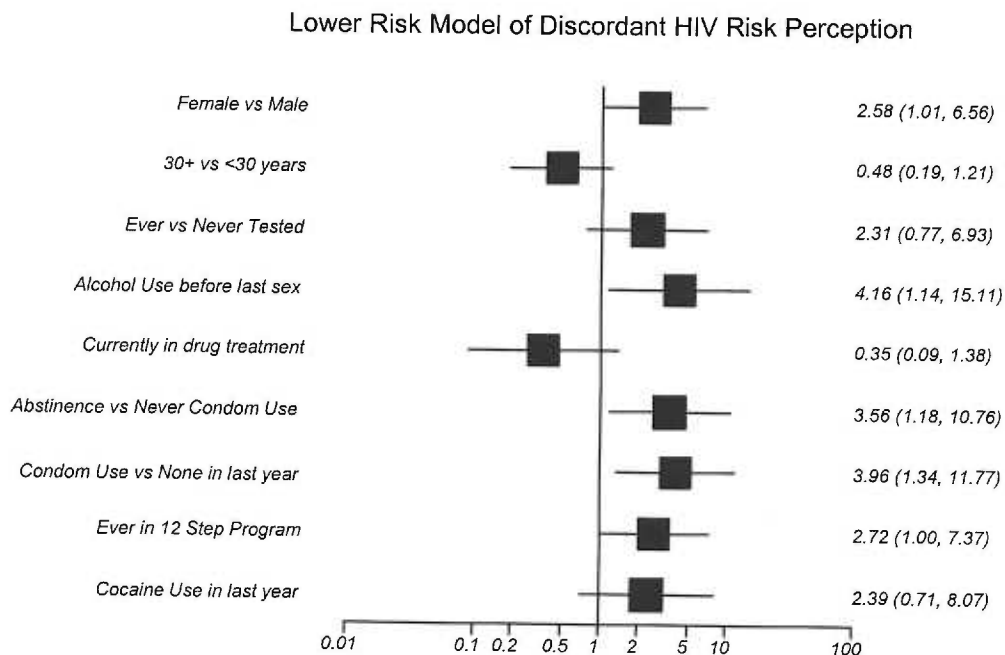


### Lower Risk Multiple Logistic Regression

The final multiple logistic regression model describing factors associated with discordance among LR respondents is displayed as a forest plot in Figure 3. Female gender, a history of ever testing for HIV, use of alcohol with last sexual encounter, a history of participating in a twelve-step program, use of condoms at any time in the past year, and use of cocaine in the past year were positively associated with a discordant risk perception (i.e., an overestimation compared to reported risky behaviors). Older age ( $\geq$ 30 years) and current enrollment in a drug treatment program were negatively associated with a discordant risk perception. Lower Risk females were 2.58 times more likely to have a discordant risk perception compared with males. Lower Risk respondents who reported alcohol use with last sexual encounter were 4.16 times more likely to be

discordant than those who did not. LR respondents who sometimes used condoms during the past year were 3.96 times more likely to be discordant compared to those that never used condoms.

**Figure 3.**



## Discussion

### Urban AIAN perceptions of personal HIV risk

Of the 218 urban AIAN analyzed in this study, we identified 92 respondents (42%) at high risk for HIV based on their self-reported behaviors. Half (49%) of those defined as high-risk perceived their risk of acquiring HIV as Medium or High, while 37% of those defined as lower risk perceived their risk as Medium or

High. Our study identified a much higher proportion of respondents who perceived their risk of HIV infection as Medium or High compared to two other published studies. Fifteen percent of a convenience sample of AIAN attending a NYC tribal gathering reported their risk of getting HIV/AIDS as moderate or high, and 9% of AIAN sampled during BRFSS from 1997-2000 reported Medium or High perceived risk of HIV infection [6, 32]. However, the convenience sample consisted mainly of heterosexual, educated AIAN women and BRFSS data is collected through telephone interviews thus excluding AIAN without telephones such as the homeless. Neither of these studies aimed to specifically sample AIAN at high-risk for HIV. Our study provides results from a different, previously unexplored, population.

### Study Population

AIAN HITS 2001 included only urban AIAN and its recruitment methodology was designed specifically to target high-risk and difficult to reach individuals. Two-thirds of our study group described themselves as either homeless or with an income less than \$1000/month. The respondents were identified through their own social networks, ensured confidentiality (no identifying information was ever collected).

Our respondent-driven sampling methodology may have influenced the findings. Since respondents were recruited through their own social networks, the lower risk group may not be representative of the lower risk urban AIAN community at

large. Instead they may be more reflective of lower risk urban AIAN who have specific ties to high-risk individuals or were formerly high-risk. Lower risk respondents who perceived their risk as Medium/High were significantly more likely to state that many of their friends had been tested as compared to those who perceived their risk as Low/None. This may explain why the proportion of our lower risk group who perceive their chance of infection as Medium or High is so much larger than the BRFSS results. Another explanation is potential misclassification based on our risk group definitions (described in detail later). Respondents with multiple sex partners that reported always using condoms or those who reported drug use other than IDU were defined as lower risk when they may be truly at higher risk. Additionally, we may have identified respondents who truthfully answered their perceived risk of infection but did not disclose their risky behaviors to the interviewer.

Our results may have been influenced by the decision to interview at an urban Indian health facility or at a downtown location. The respondents interviewed at the urban Indian health facility may be different in many ways than those interviewed at the downtown location. Respondents at either site may have felt uncomfortable being forthcoming with their answers when interviewed by strangers. However, the proportion of discordance within each risk group (high-risk and lower risk) did not vary based on interview site.

### Characteristics associated with discordance of perceived risk

We identified several lifestyle factors associated with a discordant risk perception among the high-risk and lower risk urban AIAN survey respondents separately. Among the high-risk, a high-school degree or higher, health insurance, ever having been in drug treatment, and knowledge of an AIAN with HIV or AIDS, were negatively associated with discordance (protective factors). Older age ( $\geq 30$  years), ever tested for HIV, any condom use in the past year, and injection drug use in the past year, were positively associated with discordance.

We found a strong association between knowledge of an AIAN with HIV/AIDS and risk perception among high-risk individuals. After adjusting for other factors, high-risk AIAN who had knowledge of an AIAN with HIV/AIDS were significantly more likely to report a perceived risk level more in line with their reported risky behaviors. This suggests that employing and encouraging AIAN with HIV/AIDS to talk to their community members about the disease would be a potentially successful strategy to increase accurate perceptions of risk. A cross-site investigation using focus group methodology of out-of-treatment AIAN drug users found that ex-drug users and AIAN living with HIV/AIDS were effective sources of AIDS information [22]. This approach is also quite feasible and inexpensive to conduct, helps to fulfill a broader goal of IHS to include more AIAN in healthcare provision and prevention efforts for their own people [1], and may have additional positive effects.

Older age (greater than 30 years) was associated with a discordant risk perception among high-risk urban AIAN in our investigation. This is similar to finding reported in literature. Older persons engaging in risky behavior were also likely to underestimate their perceived risk according to a study of 250 poor urban “at-risk” women who thought they had no chance of getting HIV [53]. This is a potential population to target HIV prevention messages and education.

A high school degree or higher, possession of health insurance, and a history of attending a drug treatment program were negatively associated with a discordant risk perception among high-risk urban AIAN. Schools, medical centers and drug treatment programs are all places where various HIV preventive and educational materials should be supplied and available. These findings may be used to support the promotion of HIV prevention messages and education campaigns in schools, hospitals, clinics and treatment programs. In addition, these findings provide supportive evidence to continue efforts to keep AIAN in high school and to make health care accessible to all AIAN.

Overall, respondents who reported using injection drugs were more likely to underestimate their risk status than those who reported sex with multiple partners and inconsistent condom use. In the high-risk model, active injection drug users were over three times more likely to be discordant in their risk perception than other high-risk individuals. Due to small sizes, we were not able to discern a difference in risk perception between the IDUs who reported sharing needles in



the past year versus those who did not. Nor did we identify a difference between risk perception in male versus female active IDUs, although studies have found that drug-using women are at higher risk for HIV than are men [54]. This is particularly concerning because, according to CDC HIV/AIDS surveillance reports, AIAN women in 2002 living with HIV/AIDS had the largest relative proportion exposed through injection drug use and the smallest relative proportion exposed from heterosexual contact, compared to all other races [9].

Those who reported engaging in both high-risk sex and drug behaviors during the past year (Very High-Risk), were significantly *less* likely to report receiving prevention messages compared with all others. This may be preliminary evidence that AIAN individuals at highest risk for HIV in Portland, Oregon are not being reached successfully by current methods. Evaluation of the effectiveness of HIV prevention materials to reach high-risk urban AIAN is needed.

Our analysis revealed an unanticipated association between getting tested for HIV and perception of risk. Among high-risk urban AIAN, a lifetime history of HIV testing (with majority of respondents tested multiple times) was significantly associated with a discordant perception of individual risk. These results may reveal a fundamental type of denial: a negative HIV test result may contribute to an illusion of invulnerability, even as risky behavior continues. Data from a study of AIAN injection drug and/or crack cocaine users also identified a large proportion previously tested, while many participants felt they had no chance of

infection [54]. Our findings, like those reported in *Power in the blood: AIDS, politics and communication*, provide additional evidence that HIV testing may sometimes be viewed inappropriately as sanctioning risky behavior [55].

Another possible explanation for the apparent higher proportion of HIV testing in those with discordant risk perceptions is that their risky behaviors influence whether people seek testing. There may be a group of high-risk individuals that are fully aware of their risk status, but do not care about their own safety, or are too scared to find out the results, and do not get tested. Among high-risk urban AIAN, those who accurately perceive their risk as Medium/High were significantly more likely to *not* get tested for HIV than those who perceived their risk as Low/None. This is particularly concerning because many public health efforts focus on increasing awareness of the susceptibility of HIV to increase preventive behaviors. These findings are contrary to the relationship posited by the Health Belief Model; that increased perceived risk would be positively correlated with increased preventive behaviors (HIV testing, condom use).

In recent literature, there is one study that most closely resembles our project, a study of congruence between AIDS risk perception and risk behavior in 208 women drug users in Hartford, CT [56]. Study participants perceived their risk as low despite having a high frequency of risky behaviors. In that study, variations in personal risk perceptions were related to sociodemographic differences. For example, the most socially isolated women showed the most discordance between self-reported personal risk and risk perception. Female drug users who

were most isolated (monolingual Spanish-speakers, lower levels of education, single, lower annual income, unemployed, cocaine users rather than IDUs and never had an HIV test) were most likely to incorrectly perceive their level of AIDS risk.

In our study, sociodemographic variables such as education level, homelessness/income level and household size, were associated with discordance of risk perception among high-risk urban AIAN. Lower levels of education (less than a high-school degree) were significantly associated with discordance of risk perception among high-risk individuals. A trend is suggested between income/homelessness levels and proportion of discordance among high-risk. Two-thirds of homeless high-risk respondents were discordant, 60% of high-risk with incomes of less than \$1000/month were discordant, while only 44% of high-risk with greater incomes were discordant. In addition, high-risk respondents who live alone were more likely to be discordant in their risk perception (67%) as compared to respondents who live and share income with other people (53%).

#### AIAN HIV Prevention Intervention Strategies

American Indians and Alaska Natives represent many diverse populations with various beliefs and cultures based on location, tribe and levels of assimilation. HIV rates and risk factors for HIV may vary among AIAN tribes, or by location (urban vs. rural/reservation). HIV prevention intervention strategies must take

into consideration AIAN cultural norms and beliefs to effect behavioral change. However, only two published reports have discussed HIV/AIDS prevention intervention strategies in AIAN communities [17, 28]. Previous research has focused on measuring HIV risk behaviors in reservation-based communities. Our study presents the results of a quantitative survey of knowledge, attitudes and behaviors among urban AIAN in Portland. Results can be used to guide development of HIV prevention programs for urban AIAN.

To increase accurate perceptions of individual HIV risk among AIAN and subsequent reduction in risky behaviors, misconceptions about the disease and the effectiveness of prevention behaviors must be examined, quantified and confronted. In this project we were able to measure the prevalence of misperceptions of HIV (disease transmission and prevention) among urban AIAN in Portland, OR. Overall, the proportion with inaccurate knowledge of HIV was low among the urban AIAN in our study.

It is important that AIDS prevention interventions be tailored to specific high-risk subpopulations and take into account the social and cultural factors that promote risky behaviors and block access to AIDS information and services. Singer found that socially isolated drug-using women were in need of targeted AIDS preventions [56]. There is a similar need for evaluation of prevention interventions targeting urban AIAN. Wherever possible AIAN spokespeople can

relay the prevention messages and discuss their own experiences with the disease [17].

Substance abuse treatment is the most widely endorsed mechanism of HIV preventive interventions and has been shown to be successful in reducing the frequency of risky drug and sex behaviors [57]. Almost half of urban AIAN interviewed had ever participated in a drug (47%) or alcohol (45%) treatment program. Since many urban AIAN at high-risk for HIV are participating in substance abuse treatment programs (about two-thirds of our high-risk group), local drug and alcohol treatment programs may use this study's findings to tailor their HIV prevention and education efforts.

#### Perceived Risk as a Behavioral Model Construct

Early in the AIDS epidemic, there were arguments over the efficacy of focusing on changing personal perception of risk versus focusing on changing unsafe behaviors directly. However, findings from studies such as Singer et al. and ours suggest that examining risk perception and its predictors is still an important area of prevention research. AIDS risk perception research was initiated in 1989 as a means to understand individual motivators to act (change their unsafe behaviors). It became clear that variations in perceived risk must be understood and addressed when creating and implementing prevention interventions. Some literature has focused on how self-reported personal risk is correlated with accurate AIDS knowledge. It has been shown that higher levels of AIDS

knowledge are linked with greater concordance of personal risk assessment [37, 58]. However, greater knowledge and more accurate risk assessment did not necessarily predict risk reduction and behavior change.

A key construct in models of individual health behavior such as the Health Belief Model (HBM) [36], (as well as the Transtheoretical Model [59], the Theory of Reasoned Action and the Theory of Planned Behavior [60]) is perceived risk or susceptibility. As defined by the HBM, perceived susceptibility is a measure of each individual's subjective perception of their own risk of getting a disease. Perceived severity, another component of the HBM, is one's opinion of how serious the disease is. Perceived susceptibility and severity constitute the perceived threat of disease. These concepts work in conjunction with the other model components. According to the HBM, risk perception (perceived susceptibility) is modified by demographic factors, personality traits, socioeconomic status and knowledge of disease transmission [61].

Perceived risk exists at two levels: perceived personal risk, an individual's own vulnerability, and perceived social risk, the belief that a problem exists at a community, state or racial group level. If an AIAN does not believe that the disease HIV/AIDS may affect their own cultural community, or that, for some reason, their race cannot be infected, one might expect them to be less likely to adopt preventive strategies, even when readily available and easy to use.

It may be difficult for AIAN individuals to perceive themselves at high-risk for a potentially lethal disease when the reported current prevalence in their

community is still low. Often people do not believe they need to protect themselves from an impending threat until after it has personally affected members of their family or community and then becomes real. Medical and government-based information may not even be believed by some AIAN due to mistrust based on historical relationships.

Individuals' perceptions of their own risk level may be relative to the peers in their social circle such that, high-risk individuals may tend to perceive their level of HIV risk as lower by comparing themselves to peers who engage in even more frequent and riskier sexual and drug behaviors.

This study was able to examine the differences between those at high-risk (based on self-reported behaviors) who perceive themselves at high-risk and those high-risk respondents who perceive their risk as low or none. According to the Transtheoretical Model, the first group may be at a more advanced stage of behavioral change readiness than the second [59]. They are able to acknowledge that their sex or drug behaviors put them at high-risk for contracting a life-threatening disease. However, for unclear reasons they continue with the risky behaviors. The second group may not be able to acknowledge they are personally at risk of infection. A different prevention intervention may be necessary to target them successfully. Our study results did indeed show differences in these two groups' attitudes and behaviors.

## Study Limitations

The results of our study are subject to several limitations, including potential misclassification bias, explored in detail below.

### **Socially desirable responding**

Socially desirable responding by subjects during the survey administration may have affected study results. Social desirability is the tendency to overestimate desirable traits and underestimate undesirable ones, when using self-reported measures. Results of extremely sensitive health behaviors such as frequency and types of sexual contact and frequency of drug and alcohol use may be underestimated due to underreporting during the interview.

We may assume that socially desirable responding, a type of response bias, would lead to under-reporting of risky sexual and drug-related behaviors. (Also, it might also lead to over-reporting of true condom use frequency). Some truly high-risk individuals may have been categorized as lower risk because they did not disclose their risky behaviors. If these respondents accurately perceived their risk as High/Medium, the effect would be an overestimation of discordance among lower risk and high-risk in our study. If our high-risk under-reporters are included in our lower risk group, the differences between high-risk and lower risk urban AIAN characteristics, behaviors and perceptions may be underestimated. A goal of the AIAN HITS project was explicitly to recruit high-risk urban AIAN. Recruiting such a large group of respondents who did not fit the definition of high-risk (57.8%) was unexpected. It may be that some Lower Risk did not report



risky behaviors. However, research on the validity of self-reported sexual behavior (using biomarkers such as STD rates) suggests that, if the survey questions are well-designed and executed, number of sexual partners and condom use are accurately reported [62, 63]. The CDC and AIAN HITS questionnaires have been thoroughly tested and piloted to ensure that respondents fully understand the questions about sensitive behaviors providing evidence that socially desirable responding to the AIAN HITS survey questions was minimal.

### **Misclassification Bias**

We used lifetime history of injection drug use as the definition of current high-risk drug behavior. It is likely that a few respondents who reported a history of injection drug use are no longer actively using, and thus truly are at lower drug-related HIV risk. If those misclassified as high-risk accurately perceived their risk as Low/None, this would again lead to an overestimation of discordance in both risk groups. We compared the frequencies of perceived HIV risk among those reporting a lifetime history of injection drug use versus those reporting recent injection drug use. Forty-one percent of those reporting a lifetime, but not current, history of injection drug use perceived their risk as Medium/High, 63% of those reporting recent injection drug use perceived their risk as Medium/High (not a statistically significant difference). This provides evidence that misclassification due to our definition of high-risk drug use did not significantly effect the level of discordance found among high-risk urban AIAN.

We defined high-risk sex as sex with multiple partners during the past year and inconsistent condom use. Among this group, discordance was defined as a perceived HIV risk of low or none. A person who has unprotected sex with their primary partner but sex with a condom with non-primary partners may be accurately perceiving his/her risk as less than high but would be defined as discordant in our study. Respondents from any risk group were considered discordant if they chose "don't know" to describe their perceived chance of HIV infection, this categorization may or may not be accurate.

Over one-third (37%) of the lower risk respondents assessed their risk of infection as Medium or High (defined as a discordant risk perception). A possible explanation is that lower risk urban AIAN may be overestimating their personal risk status. However, the HIV testing behavior of these individuals more closely resembles that of the high-risk respondents; in that 84% had ever tested for HIV, the majority were tested multiple times, and almost half (44%) were tested within the past year. These individuals also reported the highest relative proportion of always using condoms with sex (31%) during the past year. This is a positive preventive behavior, but may also indicate that they had engaged in risky sex at previously. Additionally, six (14%) of the lower risk respondents who were discordant in their risk perception reported ever being diagnosed with hepatitis, a disease that is transmitted through high-risk sex or drug use, suggesting that they were formerly at high-risk. Over one-third (38%) of all lower risk respondents reported ever participating in a drug treatment program.

According to the multiple logistic regression model for lower risk respondents, those with discordant risk perception, despite not reporting risky behaviors according to our definitions, had higher rates of having been tested for HIV, using alcohol before their last sexual encounter, inconsistently using condoms within the past year, having ever been in alcohol treatment, and having used cocaine in the last year. As a result, although they did not fit our study definitions of High-Risk by admitting to multiple sex partners within the last year or lifetime use of injection drugs, they were reporting other types of potentially risky sex and drug behaviors.

In previous HIV literature on high-risk individuals, inconclusive results of the association between perceived susceptibility and behavior may be related to variation in the measures used to assess susceptibility (how the question was asked) [60]. The survey question we analyzed was phrased, “As an AIAN, what are your chances of getting infected with HIV?” This question may have been misinterpreted. Although designed to capture personal risk, this question may inadvertently have broached both levels of perceived risk (perceived personal risk, an individual’s own vulnerability, and perceived social risk, the belief that a problem exists at a community, state or racial group level). It is possible that survey respondents may have understood the question to mean: as a race, what is your risk of HIV. The question was phrased this way specifically based on AIAN focus group recommendations to put individual perceived risk in the context

of being an AIAN and interviewers were trained with clarification options to state if asked.

### **Additional Limitations**

Although the total sample size consisted of over 200 urban AIAN, stratification by risk level led to relatively small subgroup sample sizes resulting in larger confidence intervals and less precision of estimates within strata. However, this is the largest sample of AIAN data on HIV risky behaviors and perceptions collected to date.

Limitations of recall may also affect this retrospective survey data since very specific risk behavior questions were asked based on the past 12 months of activity. This problem would differentially affect High-Risk respondents who may not remember exactly how many partners they had or how often they used condoms with different types of sex and sex partners. However, we may assume this limitation of recall among high-risk is non-differential (random) between discordant and concordant respondents.

Survey responses were categorized such that “no answer” was recoded as “no” to retain the largest sample size during the multiple logistic regression analysis. This was valid in most circumstances because a “no answer” on the survey often meant the question was not asked of the respondent, i.e. they answered “no” to a main survey item and the survey questioning then followed a designated skip-

pattern. Rarely, respondents chose not to answer a question at all, possibly because they did not feel comfortable reporting an unhealthy behavior. The proportion of non-response to certain risk behavior questions ranged from 0% when asked, "Have you ever in your life shot up or injected any drugs", 2% when asked, "During the past 12 months, have you had sex", to 11% when asked, "Have you given or received money or drugs for sex in the past 12 months".

This report is a secondary analysis, therefore it is limited to the survey questions asked in the primary study. This survey was originally designed to capture information about HIV testing and risk behaviors not discordance of risk perception. The survey questions do not delve into cultural beliefs or feelings, psychological correlates of risk behavior, or additional lifestyle factors that may indeed be significant predictors of a respondent's HIV risk perception. Further study is needed in these areas. This secondary analysis was based on data from the AIAN HITS study, which had a cross-section design.

Finally, the survey respondents represent a rather distinct population. The initial project attempted to recruit urban AIAN at high-risk for HIV/AIDS in Portland, Oregon. Caution should be used in generalizing to other urban communities.

## **Conclusion**

This project was a secondary analysis of the cross-sectional American Indian & Alaska Native (AIAN) HIV Testing Survey (HITS) 2001. Overall, 91 respondents (42%) defined their personal risk of HIV infection as Medium or High. Twenty two percent of respondents stated they had no chance of being infected with HIV. According to risk group, 36.5% of Lower Risk, 43.2% of Moderate High-Risk and 76.5% of Very High-Risk reported their personal chance of HIV infection as Medium or High. We determined that discordance was apparent between perceived HIV risk and self-reported risky behaviors among urban AIAN and that the prevalence of this discordance differed according to risk group (Lower Risk vs. High-Risk). Among high-risk urban AIAN, factors associated with discordant risk perception included: age, education, health insurance, history of HIV testing, knowing an AIAN person with HIV/AIDS, condom use within past year, history of drug treatment, and active IDU status. This study is an important contribution to the inadequately explored subject area of AIAN HIV risk perceptions. The results of this study can be used to focus and develop local HIV prevention interventions and can give social workers, health workers and AIAN citizens a better understanding of HIV risk perceptions and factors leading to those perceptions in urban AIAN.

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**Appendix I: Characteristics associated with discordant HIV risk perception stratified by risk group in AIAN HITS 2001**

Characteristic	Lower Risk		High-Risk		Disc vs. Conc Overall	Disc vs. Conc among LR	Disc vs. Conc among HR
	Discordant N (COL%)	Concordant N (COL%)	Discordant N (COL%)	Concordant N (COL%)			
<b>Number of respondents (N=217)</b>	49	77	53	38			
<b>Gender:</b>							
Male	15 (30.6%)	33 (42.9%)	27 (50.9%)	20 (52.6%)	0.47	0.17	0.87
Female	34 (69.4%)	44 (57.1%)	26 (49.1%)	18 (47.4%)			
<b>Age:</b>							
18-24	14 (28.6%)	17 (22.1%)	8 (15.1%)	7 (18.4%)	0.53	0.18	0.86
25-29	11 (22.4%)	13 (16.9%)	4 (7.5%)	4 (10.5%)			
30-39	11 (22.4%)	12 (15.6%)	14 (26.4%)	8 (21.1%)			
40-49	10 (20.4%)	19 (24.7%)	20 (37.7%)	16 (42.1%)			
>=50	3 (6.1%)	16 (20.8%)	7 (13.2%)	3 (7.9%)			
<b>Income:</b>							
Homeless	4 (8.2%)	8 (10.4%)	12 (22.6%)	6 (15.8%)	<b>0.04</b>	0.22	0.37
<\$1000/month	30 (61.2%)	35 (45.5%)	33 (62.3%)	22 (57.9%)			
>\$1000/month	15 (30.6%)	34 (44.2%)	8 (15.1%)	10 (26.3%)			
<b>Members of household:</b>							
Single	24 (49%)	25 (51%)	26 (68%)	13 (33%)	0.03	.11	.21
Multiple	24 (34%)	46 (66%)	24 (53%)	21 (47%)			
<b>Education:</b>							
<HS grad	14 (28.6%)	23 (29.9%)	20 (37.7%)	7 (18.4%)	0.24	0.88	<b>0.05</b>
HS grad or more	35 (71.4%)	54 (70.1%)	33 (62.3%)	31 (81.6%)			
<b>Health Insurance:</b>							
Any	44 (91.7%)	66 (85.7%)	41 (77.4%)	35 (92.1%)	0.44	0.32	0.06
IHS	19 (38.8%)	30 (39.0%)	17 (32.1%)	24 (63.2%)	0.08	0.98	<b>0.003</b>
OHP	24 (49.0%)	37 (48.1%)	37 (69.8%)	28 (73.7%)	0.63	0.92	0.69
Private	5 (10.2%)	11 (14.3%)	1 (1.9%)	3 (7.9%)	0.11	0.5	0.3
<b>Employment:</b>							
Currently employed	19 (39.6%)	35 (45.5%)	15 (30.0%)	11 (29.7%)	0.4	0.52	0.98

**Characteristics associated with discordant HIV risk perception stratified by risk group in AIAN HITS 2001 cont.**

Characteristic	Lower Risk		High-Risk		Disc vs. Conc Overall	Disc vs. Conc among LR	Disc vs. Conc among HR
	Discordant N (COL%)	Concordant N (COL%)	Discordant N (COL%)	Concordant N (COL%)			
<b>Number of respondents (N=217)</b>	49	77	53	38			
<b>Race other than AI/AN:</b>							
Multiracial	5 (10.2%)	9 (11.7%)	15 (28.3%)	6 (15.8%)	0.19	0.8	0.16
<b>Sexual orientation:</b>							
Heterosexual	46 (93.9%)	73 (94.8%)	47 (88.7%)	33 (86.8%)	0.79	1	1
Other	3 (6.1%)	4 (5.2%)	6 (11.3%)	5 (13.2%)			
<b>Ever been tested for HIV:</b>							
Yes	41 (83.7%)	56 (73.7%)	51 (96.2%)	31 (81.6%)	<b>0.007</b>	0.19	<b>0.03</b>
<b>Of tested, how many times? (N=177)</b>							
Once	12 (29.3%)	25 (45.5%)	7 (14.0%)	6 (19.4%)	0.06	0.27	0.46
2-3 times	19 (46.3%)	19 (34.5%)	20 (40%)	15 (48.4%)			
4+ times	10 (24.4%)	11 (20.0%)	23 (46%)	10 (32.3%)			
<b>Of tested, in past 12 months?</b>							
Yes	18 (43.9%)	15 (27.3%)	27 (55.1%)	18 (58.1%)	0.12	0.09	0.8
<b>Of tested, on regular basis?</b>							
Yes	15 (40.5%)	16 (30.2%)	18 (39.1%)	13 (43.3%)	0.52	0.31	0.72
<b>Reasons for getting tested ever</b>							
Doctor suggested it	20 (48.8%)	17 (30.4%)	19 (37.3%)	12 (38.7%)	0.21	0.07	0.9
Someone else suggested it	12 (29.3%)	14 (25.0%)	21 (41.2%)	12 (38.7%)	0.4	0.64	0.83
Partner told you he/she was HIV+	2 (4.9%)	2 (3.6%)	3 (5.9%)	2 (6.5%)	0.8	1	1
Might have been exposed through sex	20 (48.8%)	23 (41.1%)	24 (47.1%)	17 (54.8%)	0.8	0.45	0.49
Might have been exposed through drugs	6 (14.6%)	0 (0%)	18 (35.3%)	14 (45.2%)	0.1	<b>0.005</b>	0.37
Health problem that might be from HIV	5 (12.2%)	4 (7.1%)	5 (9.8%)	2 (6.5%)	0.35	0.49	0.71
Concerned you could give HIV to someone	16 (40.0%)	13 (23.2%)	17 (33.3%)	16 (51.6%)	0.68	0.08	0.1
Wanted to know where you stood	35 (85.4%)	48 (85.7%)	41 (80.4%)	29 (93.5%)	0.26	0.96	0.12
Wanted to get medical care if you had HIV	32 (78.0%)	30 (53.6%)	37 (72.5%)	22 (71.0%)	<b>0.03</b>	<b>0.01</b>	<b>0.88</b>
You or your partner was pregnant or planning	13 (31.7%)	13 (23.2%)	8 (15.7%)	5 (16.1%)	0.73	0.35	1
A sexual partner wanted you to	2 (4.9%)	7 (12.7%)	10 (19.6%)	5 (16.1%)	0.86	0.29	0.69
Part of an STD or routine medical check-up	30 (73.2%)	26 (46.4%)	26 (51.0%)	18 (58.1%)	0.17	<b>0.01</b>	0.53
Had to for military, jail, alcohol or drug treatment	10 (24.4%)	10 (18.2%)	16 (31.4%)	10 (32.3%)	0.45	0.46	0.93



**Characteristics associated with discordant HIV risk perception stratified by risk group in AIAN HITS 2001 cont.**

Characteristic	Lower Risk		High-Risk		Disc vs. Conc Overall	Disc vs. Conc among LR	Disc vs. Conc among HR
	Discordant N (COL%)	Concordant N (COL%)	Discordant N (COL%)	Concordant N (COL%)			
<b>Number of respondents (N=217)</b>	49	77	53	38			
Where tested last Medical/counseling site AI/AN facility	17 (41.5%) 19 (46.3%)	29 (51.8%) 15 (26.8%)	22 (43.1%) 17 (33.3%)	10 (32.3%) 13 (41.9%)	0.73	0.23	0.8
Jail/drug treatment program Other	2 (4.9%) 3 (7.3%)	4 (7.1%) 8 (14.3%)	6 (11.8%) 6 (11.8%)	4 (12.9%) 4 (12.9%)			
<b>Heard prevention messages?</b>					0.66	0.69	0.32
Yes	38 (77.6%)	62 (80.5%)	46 (86.8%)	30 (78.9%)			
<b>Received free condoms?</b>					0.77	0.9	0.33
Yes	27 (55.1%)	41 (53.9%)	31 (58.5%)	26 (68.4%)			
<b>Know AI/AN living with HIV</b>					0.29	0.67	0.16
Yes	16 (32.7%)	28 (36.4%)	18 (34.0%)	18 (48.6%)			
No/Don't Know	33 (67.3%)	49 (63.6%)	35 (66.0%)	19 (51.4%)			
<b>Know AI/AN died of AIDS</b>					0.7	0.78	0.2
Yes	14 (28.6%)	20 (26.3%)	16 (30.2%)	16 (43.2%)			
No/Don't Know	35 (71.4%)	56 (73.7%)	37 (69.8%)	21 (56.8%)			
<b>Condom use with sex within last year</b>					0.03	0.03	0.5
Never	12 (37.5%)	32 (66.7%)	21 (50.0%)	21 (63.6%)			
Some of the time	10 (31.3%)	10 (20.8%)	19 (45.2%)	11 (33.3%)			
Always	10 (31.3%)	6 (12.5%)	2 (4.8%)	1 (3.0%)			
<b>Alcohol use before last sex</b>	11 (32.4%)	4 (7.5%)	23 (50.0%)	21 (61.8%)	0.06	0.003	0.3
<b>Drug use before last sex</b>	2 (5.9%)	3 (5.7%)	12 (26.1%)	15 (44.1%)	0.6	1	0.09
<b>Alcohol/drug treatment</b>					0.86	0.8	0.08
Ever been in drug treatment program	18 (39.1%)	28 (36.8%)	29 (54.7%)	27 (73.0%)			
Currently in drug treatment program	4 (8.2%)	13 (16.9%)	15 (28.3%)	12 (31.6%)	0.57	0.16	0.74
Ever been in twelve step program	21 (46.7%)	24 (33.8%)	34 (64.2%)	19 (54.3%)	0.03	0.17	0.36
Currently in twelve step program	10 (20.4%)	13 (16.9%)	15 (28.3%)	9 (23.7%)	0.34	0.62	0.62

**Characteristics associated with discordant HIV risk perception stratified by risk group in AIAN HITS 2001 cont.**

Characteristic	Lower Risk		High-Risk		Disc vs. Conc Overall	Disc vs. Conc among LR	Disc vs. Conc among HR
	Discordant 49 N (COL%)	Concordant 77 N (COL%)	Discordant 53 N (COL%)	Concordant 38 N (COL%)			
<b>Number of respondents (N=217)</b>							
<b>STD Testing</b>							
Ever had an STD test	37 (75.5%)	51 (67.1%)	45 (84.9%)	29 (76.3%)	0.08	0.32	0.3
STD test in last year	13 (26.5%)	18 (23.4%)	21 (39.6%)	20 (52.6%)	0.96	0.69	0.22
<b>Hepatitis (N=201)</b>							
Hepatitis	6 (14.3%)	5 (7.0%)	24 (47.1%)	16 (43.2%)	<b>0.04</b>	0.32	0.72
<b>Alcohol use</b>							
3+ drinks in one day within last year?	34 (69.4%)	42 (54.5%)	42 (79.2%)	28 (73.7%)	<b>0.03</b>	0.1	0.54
3-5 drinks in one day within last year?							
Never	1 (2.9%)	1 (2.4%)	0 (0%)	0 (0%)			
Less than weekly	13 (38.2%)	21 (51.2%)	12 (28.6%)	9 (32.1%)			
Weekly or more	20 (58.8%)	19 (46.3%)	30 (71.4%)	19 (67.9%)	0.42	0.53	0.75
6-10 drinks in one day within last year?							
Never	9 (27.3%)	9 (22.0%)	8 (19.5%)	4 (14.3%)	0.8	0.65	0.67
Less than weekly	11 (33.3%)	18 (43.9%)	14 (34.1%)	8 (28.6%)			
Weekly or more	13 (39.4%)	14 (34.1%)	19 (46.3%)	16 (57.1%)			
11+ drinks in one day within last year?							
Never	21 (61.8%)	16 (40.0%)	13 (31.0%)	5 (17.9%)	0.07	0.17	0.11
Less than weekly	6 (17.6%)	10 (25.0%)	17 (40.5%)	8 (28.6%)			
Weekly or more	7 (20.6%)	14 (35.0%)	12 (28.6%)	15 (53.6%)			
<b>Drug use</b>							
Ever used drugs to get high?	26 (54.2%)	31 (40.3%)	43 (81.1%)	31 (81.6%)	<b>0.03</b>	0.13	0.96
Of those who answered yes: Within last year,							
Amphetamines, meth, speed, crack	7 (33.3%)	6 (20.0%)	14 (37.8%)	19 (65.5%)	0.5	0.28	<b>0.03</b>
Crack	4 (19.0%)	4 (13.3%)	15 (40.5%)	10 (34.5%)	0.28	0.7	0.62
Cocaine	10 (47.6%)	6 (20.0%)	19 (51.4%)	14 (48.3%)	0.08	<b>0.04</b>	0.8
Downers	1 (4.8%)	1 (3.3%)	5 (13.5%)	4 (13.8%)	0.73	1	1
Hallucinogens	3 (14.3%)	2 (6.7%)	3 (8.1%)	3 (10.3%)	0.73	0.64	1
Designer drugs	0 (0%)	2 (6.7%)	2 (5.4%)	2 (7.1%)	0.68	0.51	1
Heroin (smoked, snorted)	0 (0%)	0 (0%)	8 (22.9%)	6 (21.4%)	0.52	NA	0.89
Marijuana	17 (73.9%)	15 (48.4%)	23 (59.0%)	21 (67.7%)	0.46	0.06	0.45

**Characteristics associated with discordant HIV risk perception stratified by risk group in AIAN HITS 2001 cont.**

Characteristic	Lower Risk		High-Risk		Disc vs. Conc Overall	Disc vs. Conc among LR	Disc vs. Conc among HR
	Discordant N (COL%)	Concordant N (COL%)	Discordant N (COL%)	Concordant N (COL%)			
<b>Number of respondents (N=217)</b>	49	77	53	38			
<b>HIV Perceptions (% of Agreement)</b>							
If you have HIV but feel well, medical care can help you live longer and healthier	35 (71.4%)	64 (83.1%)	44 (83.0%)	33 (86.8%)	0.2	0.12	0.62
Having AIDS/HIV is a death sentence	33 (67.3%)	48 (62.3%)	32 (60.4%)	22 (57.9%)	0.67	0.57	0.81
Sex partners want to know if you've had HIV test	25 (51.0%)	41 (53.9%)	32 (60.4%)	17 (45.9%)	0.19	0.75	0.18
Many of your friends have gotten the HIV test	29 (59.2%)	28 (36.8%)	28 (53.8%)	16 (42.1%)	<b>0.01</b>	<b>0.01</b>	0.27
Less concerned about getting HIV than 5 yrs ago	19 (39.6%)	39 (51.3%)	32 (60.4%)	19 (50.0%)	0.96	0.2	0.33
Less careful about being safe than 5 years ago	15 (30.6%)	21 (27.6%)	10 (18.9%)	7 (18.9%)	0.96	0.72	1
By taking new HIV drug therapies people HIV+ decrease the chances of infecting their partner	16 (32.7%)	23 (29.9%)	20 (37.7%)	9 (25.0%)	0.27	0.74	0.21
Oral sex without a condom is safe if there is no ejaculation	3 (6.1%)	4 (5.2%)	5 (9.4%)	3 (8.1%)	0.62	1	1
Anal or vaginal sex without a condom is safe if no ejaculation	4 (8.2%)	5 (6.5%)	2 (3.8%)	6 (15.8%)	0.31	0.74	0.06
Sometimes you do things where you might get HIV (not using condoms or not cleaning needles)	25 (51.0%)	34 (44.2%)	38 (71.7%)	23 (60.5%)	0.07	0.45	0.26
Sometimes you do things where you might get HIV because HIV is a gay man's disease	4 (8.2%)	6 (7.8%)	3 (5.7%)	3 (7.9%)	0.79	1	0.69
Sometimes you do things where you might get HIV because HIV is a white man's disease	6 (12.2%)	7 (9.1%)	3 (5.7%)	7 (18.4%)	0.42	0.57	0.09
You never think about getting HIV	11 (22.4%)	31 (40.8%)	18 (34.0%)	15 (40.5%)	0.06	<b>0.03</b>	0.52
You are burned out thinking about HIV	12 (24.5%)	19 (24.7%)	17 (32.1%)	12 (31.6%)	0.81	0.98	0.96
People are less careful about avoiding HIV today because they are tired of being safe	18 (36.7%)	27 (35.1%)	15 (28.3%)	7 (18.4%)	0.66	0.85	0.28
You often tune out messages about HIV	9 (18.4%)	18 (23.7%)	13 (25.0%)	14 (36.8%)	0.29	0.48	0.23
HIV can be spread through heterosexual sex	45 (91.8%)	72 (93.5%)	48 (90.6%)	38 (100.0%)	0.18	0.74	0.07
You would be comfortable going to a tribal or urban Indian health center for an HIV test	45 (91.8%)	65 (84.4%)	45 (84.9%)	31 (81.6%)	0.32	0.22	0.67
If you were to get an HIV test, you would list your ethnicity as AI/AN	44 (91.7%)	71 (92.2%)	50 (94.3%)	33 (86.8%)	0.49	1	0.27
You would be comfortable dating someone with HIV	9 (18.4%)	14 (18.2%)	16 (30.2%)	9 (23.7%)	0.42	0.98	0.49