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RISK AND PROTECTIVE FACTORS RELATED TO HIV-RISK BEHAVIOR: A COMPARISON BETWEEN HIV-POSITIVE AND HIV-NEGATIVE YOUNG MEN WHO HAVE SEX WITH MEN

By

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ABSTRACT

RISK AND PROTECTIVE FACTORS RELATED TO HIV-RISK BEHAVIOR: A COMPARISON BETWEEN HIV-POSITIVE AND HIV-NEGATIVE YOUNG MEN WHO HAVE SEX WITH MEN

By

Jason C. Forney

The objective of this study was to assess and compare the prevalence of high risk sexual behaviors among young HIV-negative (n = 8,064) and HIV-positive (n = 171) men who have sex with men (MSM) on predictors of unprotected anal intercourse (UAI). Using venue-based time-space sampling, 8,235 MSM aged 15-25 were anonymously surveyed as a part of the Community Intervention Trial for Youth (CITY). The Project was conducted in 13 communities across the United States from 1999-2002. As hypothesized, there were few differences between the serostatus group rates of risky sexual behaviors, which were high for all of the sexually active men. It was found that 40% of HIV-positive men and 34% of HIV-negative men reported to have had UAI in the previous 3 months. HIV-positive MSM were more likely to have traded sex for money, food, drugs or a place to stay within the previous year and to have had sex while high during their last sexual encounter than were their uninfected peers. HIV-infected men also had UAI with more sexual partners than did those who were uninfected. Multivariate analyses indicated that for HIV-negative men, positive peer norms regarding safer sex and being Black or Latino predicted avoidance of UAI. Among HIV-positive men, having social support for safer sex and positive peer norms predicted avoidance of UAI. Our findings suggest that young HIV-positive MSM are a relevant subgroup for prevention because they constitute a significant source from which future infections could be generated.

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Introduction

Acquired Immunodeficiency Syndrome (AIDS) was first recognized in 1981. AIDS is a fatal disease that is associated with a severely poor immune system (immunosupression) and one or more opportunistic infections. AIDS is caused by the Human Immunodeficiency Virus (HIV). Researchers are uncertain as to how the virus entered the human population, but the first cases in the United States were among men who have sex with men (MSM) (Stine, 2002). On average, the HIV virus does not progress to AIDS for 10 years after seroconversion (CDC, 1998).

According to the Centers for Disease Control (CDC, 1999), HIV is most commonly transmitted through blood and semen. Transmission of the virus occurs when HIV-infected blood or semen enters the bloodstream of someone who is uninfected. The majority of people contract the virus through unprotected vaginal or anal sex, or sharing syringes during drug use (CDC, 2007). Unprotected anal sex, in particular, is the most dangerous sexual activity for contracting HIV since the walls of the rectum are very thin, which allow the virus to enter the bloodstream during sexual intercourse (Stine, 2002). Thus, men who have sex with men (MSM) are at high risk for HIV infection.

Epidemiology of HIV/AIDS in the United States

At the end of 2005, it has been estimated that 1,205,969 individuals were living with HIV or AIDS in the United States (CDC, 2007). According to the most recent CDC surveillance report (2007), 55,000-60,000 people are becoming infected with HIV/AIDS every year. In terms of incidence rates, disparities in gender, age, and ethnicity exist. For instance, 71% of new HIV diagnoses made between 2001-2005 were among men. The

highest rate of new HIV diagnoses were among men aged 25-44 (62%). Although young men under 25 years old accounted for only 14% of new cases, the rate of new HIV diagnoses among this age group has steadily increased since 2001. African Americans experienced the highest rate of new HIV diagnoses (51%), followed by whites (29%) and finally Hispanics (18%). Regarding racial trends, rates of new HIV cases among African Americans and Hispanics have substantially increased, while infections among whites have decreased over the past 5 years.

By 2005, over 550,000 people had died of AIDS-related causes in the United States (CDC, 2007). AIDS related mortality reached its peak in 1994 but sharply dropped between 1996 and 2000 (Karon, Fleming, Steketee, & De Cock, 2001). Recent data suggests that this downward trend reached a plateau in 2001 and has remained stable through 2005 (CDC, 2005a). This decrease in mortality is most likely attributable to advances in antiviral medication (CDC, 2005b).

In summary, the prevalence of HIV and AIDS is disproportionately elevated among MSM and racial minorities. Although the rates of new HIV infections seem to have stabilized over the past decade, the proportion of these cases are growing among younger MSM. With thousands of Americans becoming infected every year, HIV/AIDS remains an important public health issue. Furthermore, the number of AIDS-related deaths is substantially lower than the number of new infections. Thus, there are more people than ever with this disease who are living in the U.S. population.

Prevention among HIV- infected People

Prevention initiatives have traditionally focused on reducing HIV-risk among uninfected individuals (Janssen et al., 2001; Kalichman, Kelly, & Rompa, 1997).

Prevention professionals have typically assumed that HIV testing and a one-shot post-test counseling session was sufficient to significantly reduce the sexual risk behaviors of men who are diagnosed with HIV or AIDS (Norton, Miller, & Johnson, 1997). Unfortunately, several obstacles have stood in the way of HIV testing as a prevention initiative for people living with HIV/AIDS. First, when the HIV test became widely available in 1985 (Wolitski et al., 2006) there was no cure or treatment for HIV, which left little incentive for people to get tested. Second, advocacy organizations for gays and lesbians, and people living with HIV/AIDS such as the ACLU and the Gay Men's Health Crisis did not readily embrace HIV testing because of its initial mis-uses (Schiltz & Sandfort, 2000). For example, health insurance companies made attempts to screen applicants for HIV in order to avoid paying for the medical treatment of these individuals (Malinowsky & Perry, 1989). Life insurance companies followed suit, requiring individuals to get tested for HIV in order to obtain coverage (Malinowsky & Perry, 1989). Finally, the general public held many misconceptions concerning the spread of HIV. Public opinion polls in the mid-1980's revealed that the majority of Americans believed the virus could be transmitted through non-sexual, casual contact (Herek & Glunt, 1988). In turn, people living with HIV/AIDS were feared and stigmatized. Thus, individuals had nothing to gain but a lot to lose by obtaining an HIV test.

However, in 1987, Azidothymidine (AZT), the first treatment for HIV was approved by the Food and Drug Administration (FDA), and other effective treatments that delayed the progression of HIV to AIDS became available thereafter (Beck-Sague, 2004). Voluntary HIV testing began to increase because these new treatments provided an incentive for individuals to get tested. Although the testing rates have increased over

the past 2 decades, the preventative utility of HIV testing and counseling with individuals diagnosed with HIV/AIDS remains in question. Most importantly, as discussed later, the data remain equivocal regarding whether or not people change as a result of learning that they are HIV-positive.

Advances in treatment for AIDS also have implications for prevention. Since the mid 1990's, the life expectancy of HIV-infected individuals has vastly improved due to new and improved combination therapies (Beck-Sague, 2004). With HIV-positive people leading longer and healthier lives, they can also engage in sexual activity for years following HIV infection. Unfortunately, when HIV-positive individuals have sexual contact with serodisconcordant partners, they place individuals at risk for contracting the virus if condoms are not used consistently and properly. Since it has been estimated that there are now over 1 million people in the United States living with HIV (Glynn & Rhodes, 2005), if these individuals are engaging in risky sexual behaviors, it is an important public health priority to initiate prevention activities with this population in order to control and eradicate the epidemic.

In 2002, in response to the need to include HIV-positive individuals in risk reduction initiatives, the CDC unveiled the Serostatus Approach to Fighting the HIV Epidemic (SAFE) (CDC, 2003). This plan included goals to increase the number of HIV-infected persons who know their serostatus, increase the use of health care and prevention services, and increase high-quality care and treatment. However, for the first time in history, the CDC incorporated two additional goals specific to HIV-infected individuals: 1) increase adherence to antiviral therapy among individuals with HIV and 2) increase the number of individuals with HIV who adopt and sustain HIV and STD risk reduction

behavior. In 2003, the CDC continued to emphasize the need to target HIV-infected individuals for prevention in their Advancing HIV Prevention (AHP) plan (CDC, 2003). AHP included plans to initiate prevention programs for HIV-positive individuals in public health departments and AIDS service organizations throughout the country.

Although prevention programs for HIV-positive individuals are now being disseminated across the nation, these programs are not targeted to all of the various subgroups among the HIV-positive population. In particular, few innovations have been tailored to meet the specific needs of young MSM or young MSM of color. For example, in 2006, the CDC announced 18 "Best-Evidence Interventions" (CDC, 2006) as the most effective HIV prevention programming available. Among these interventions, three were designed for "high-risk" HIV-negative youth, one was for HIV-positive adult MSM, two targeted HIV-negative MSM and the remainder was focused on heterosexual adults. Only one program targeted HIV-positive youth. This individual-level intervention entitled "Choosing Life: Empowerment, Action, Results" (CLEAR) is specifically targeted to young HIV-infected men and women who have a history of substance abuse. The lack of prevention programs for HIV-positive young MSM might be partly attributed to the fact that we know very little about the sexual behaviors of this subgroup or the risk and protective factors surrounding their sexual behaviors. Without such information, it may be difficult to design effective prevention initiatives to meet the prevention needs of young HIV-infected MSM.

In summary, prevention programming has typically focused on reducing sexual risk behaviors among HIV-negative individuals. Although at one time it was assumed that testing, diagnosis, and post-test counseling was sufficient as prevention for HIV-

infected individuals, data show this as insufficient. Increased prevention efforts are needed in order to reduce sexual risk with this population. Such interventions are beginning to be developed and disseminated to adult HIV-positive men. However, little has been done to address the prevention needs of younger MSM living with HIV/AIDS, especially among ethnic and racial minorities. Research exploring the sexual risk patterns of young HIV-infected MSM may facilitate the development of such prevention initiatives.

HIV-risk Behaviors among HIV-infected Men

Risky sexual behaviors seem to vary among age groups of HIV-positive MSM. Generally, current research supports that adult MSM reduce their risky sexual behaviors immediately following their HIV-positive diagnosis. For instance, in a meta-analytic review of 27 studies that investigated the effects of HIV testing and counseling on HIV-risk behavior, researchers found that individuals who tested HIV-positive were more likely to decrease engagement in unprotected sexual intercourse and increase condom use following testing and counseling when compared to HIV-negative and untested groups (Weinhardt, Carey, Johnson, & Bickham, 1999). It should be noted that only seven of the studies included in this meta-analysis were conducted with MSM and none exclusively included HIV-positive young MSM. Thus, it is unclear whether these results would apply to young MSM. Furthermore, these studies do not paint a clear picture of how long the trends in decreased risk behaviors endure after diagnosis. The studies included in this review only tracked HIV-positive participants for an average of 261 days. Thus, it may be true that adult MSM decrease their risky sexual behaviors, but the duration of this trend remains in question.

Recent research suggests that rates of unprotected sex increase over time among HIV-positive men. For example, in a recent study that was not included in Weinhardt's meta-analysis, DiFranceisco, Pinkerton, Dyatlov, & Swain (2005) found that individuals who were diagnosed within 3 months of the study were more likely to report condom use when compared with individuals who had been diagnosed at least 1 year prior to the study. Another study that tracked HIV-positive adults longitudinally found that that the rate of unprotected insertive anal intercourse with a negative or unknown status partner sharply dropped immediately after diagnosis, but increased significantly 12 months later (Colfax et al., 2002). Thus, it appears that HIV-positive men decrease HIV-risk behavior following diagnosis but these changes are not sustained over time.

Cross-sectional studies providing HIV testing to research participants have also contributed to the understanding of sexual risk behaviors among HIV seropositive adult MSM. The majority of these studies compare sexual risk among HIV-positive individuals to similar samples composed of individuals who test negative. Such research has found that HIV-infected adult MSM who are aware of their HIV seropositivity engage in similar rates of unprotected sex as their HIV-negative peers (Deren, Beardsley, Coyle, & Singer, 1998; George, Green, & Murphy, 1998; Kral et al., 2005; Myers, Javanbakht, Martinez, & Obediah, 2003; Ostrow, McKirnan, Klein, & DiFranceisco, 1999). There is no compelling evidence that HIV-infected adult men engage in fewer or greater sexual risk behaviors when compared to samples of HIV-negative adult men. In sum, adult MSM living with HIV/AIDS seem to reduce their risky sexual behaviors following diagnosis. However, there is accumulating evidence that engagement in sexual risk behaviors begin returning to pre-diagnosis levels by about 12 months post-diagnosis.

Although adult MSM living with HIV/AIDS seem to decrease their sexual risk behavior following diagnosis, it is unclear whether these behavior changes occur among young and adolescent HIV-positive MSM. No longitudinal studies have examined the trajectory of sexual risk behaviors after HIV diagnosis among young MSM. However, a small number of cross-sectional studies with young HIV-infected MSM have explored the sexual risk behaviors of these individuals. For instance, the Young Men's Survey (YMS) (Valleroy et al., 2000), the largest of these studies, assessed HIV-risk among young and adolescent MSM. This multi-site study was conducted between 1994-1998 and recruited 3,492 MSM between the ages of 15-22. Of the 3,492 men sampled, 7.2% tested HIV-positive. Only 18% of these men knew their HIV-positive status prior to contact with the researchers. Findings from this study indicated that the young men who were not aware of their HIV seropositivity were more likely to participate in unprotected receptive or insertive anal intercourse during the preceding 6 months when compared with HIV-negative men. Furthermore, the men who were aware that they were HIV-infected were equally as likely to engage in unprotected sex as their HIV-negative peers. Thus, this research suggests that HIV-positive young MSM continue to engage in sexual risk behaviors regardless of their HIV serostatus knowledge. In addition, these results contrast with findings from similar studies of adult HIV-positive MSM. While adult MSM seem to decrease engagement in risky sexual behaviors following diagnosis, young men who are aware they are HIV seropositive seem not to alter their risky sexual behaviors.

High rates of risky sexual behaviors among HIV-positive young MSM were also found in the San Francisco Young Men's Health Study (Hays et al., 1997). This project

used a probability sample of 408 males aged 18-29 from the San Francisco Area. Of those men who were previously tested for HIV antibodies, 17% reported they were infected with the HIV virus. After these men were tested by the researchers, an additional 4% were found to be HIV-positive. Among men who had never been previously tested for HIV, 10% were found to be HIV-positive by the researchers. Thus, a total of 18.7% of the entire sample was HIV-positive with 25% being unaware of their seropositivity prior to contact with the researchers. Sexual risk behaviors were compared between three categories of men: 1) men who perceived themselves to be HIV-negative, 2) men who perceived themselves to be HIV-positive, and 3) men who were not tested prior to contact with the research staff and were unaware of their serostatus. It was found that the HIV-positive group of men engaged in the highest rates of risky sexual behavior. For instance, 59% of those who perceived themselves to be HIV-positive reported having unprotected receptive and/or insertive anal intercourse within the previous year. These same behaviors were only endorsed by 35% of the men who perceived themselves to be HIV-negative and 28% among the untested group. These findings further support the notion that young HIV-positive MSM are engaging in significantly elevated rates of unprotected sex when compared to their HIV-negative peers. The rates of unprotected sex are also higher than typically found in studies of adult men.

Studies relying on convenience samples of young MSM provide additional evidence for high rates of risky sexual behavior among HIV-infected young men. For instance, Hein, Dell, Futterman, Rotheram-Borus, & Shaffer (1995) examined the sexual risks behaviors of 793 adolescents aged 13-21 who were receiving inpatient or outpatient medical and/or psychiatric services. Following HIV antibody testing, 9% of the sample

was determined to be HIV-positive. In comparing the participants by their serostatus, the researchers found that HIV-positive men were significantly more likely to engage in insertive and receptive oral and/or anal intercourse. HIV-positive adolescents also reported to have experienced a greater number of sexually transmitted diseases, and were more likely to have engaged in survival sex, sex with casual partners, and use condoms infrequently when compared to HIV-negative men. Another study that explored the patterns of risky sexual behaviors of young HIV-positive MSM was conducted by Stein, Rotheram-Borus, & Milburn (2005). This study employed a convenience sample of 248 adolescent MSM who were receiving services at clinical care sites in four AIDS epicenters across the United States. Findings from this study indicated that only 17% of 248 HIV-positive young males abstained from sex. Furthermore, 23% of the participants reported that they had never used condoms during sex within the prior 3 months. Also, the men reported an average of seven sexual partners within the preceding 3 months. Although this study did not utilize a comparison group of HIV-negative MSM, the rates of sexual risk behavior reported by these men are alarmingly high.

As with most community-based research, findings from the aforementioned studies dealing with HIV-positive youth come with significant limitations. One major problem is that HIV-infected young men are a hard to reach population, which makes obtaining representative samples an enormous challenge. Thus, some researchers have relied upon convenience samples of participants receiving medical and/or mental health services (Hein, Dell, Futterman, Rotheram-Borus, & Shaffer, 1995; Stein, Rotheram-Borus, Swendeman, & Milburn, 2005). However, the results of studies using a

community-based sample do not differ from those that employed probability samples (e.g. Valleroy et al., 2000). Therefore, we may be more confident in these findings.

The preceding studies indicate that HIV-positive young men engage in an alarmingly high rate of unprotected sex. In contrast with studies of adults, no research with young HIV-infected young MSM has provided evidence that men who are aware of their HIV-positive status reduce their high risk sexual behaviors after diagnosis. These studies provide some evidence that young HIV-infected MSM who are aware of their HIV status, in comparison to their HIV-negative peers, report either equal (Valleroy et al., 2000) or higher rates of risky sexual behaviors (Hays et al., 1997; Hein et al., 1995). Regarding men who are unaware of their HIV status, only two studies provided such analyses and their results were inconsistent. In any case, this small body of research provides some compelling support that young HIV-positive MSM are engaging in high rates of unprotected sex. In turn, these young MSM are undoubtedly making a significant contribution to the spread of HIV/AIDS.

Risk & Protective Factors

Many of the published studies with young HIV-positive MSM have primarily dealt with risk factors rather than protective factors for high risk sexual behaviors. These studies have taken a deficit-oriented approach to studying predictors of risky sexual behaviors. Common risk factors that have been investigated within this population include substance use during sex and engagement in sex trade.

Substance use during sex

Substance use presents a serious barrier to HIV prevention initiatives among MSM due to its relationship with risky sexual behaviors. The use of these illegal

substances before, or during sex is problematic because they are known to impair one's judgment. Thus, individuals who are "high" may fail to engage in risk reduction practices within their sexual encounters.

Substance use among HIV-negative or unknown serostatus MSM is high. Many MSM use drugs and alcohol during sexual activities (Stall & Purcell, 2000). Use of alcohol, nitrite inhalants, crystal methamphetamine, cocaine, marijuana, and Viagra have been implicated in acts of unprotected anal sex among gay and bisexual men (Hirshfield, Remien, Humberstone, Walavalkar, & Chiasson, 2004). The relationship between substance use and high risk sexual behavior has also been reported among HIV-positive young MSM. For instance, the Young Men's Survey found that HIV-infected young MSM were more likely to have sex while under the influence of crack cocaine, nitrite inhalants, or injection drugs when compared with HIV-negative MSM (Harawa et al., 2004). In another study of inpatient and outpatient young men receiving services at a medical center in New York City, comparisons of HIV-positive and HIV-negative adolescents showed that those who were HIV-positive were more likely to have engaged in sexual activities while drunk or high (Hein et al., 1995). These studies show that drug and alcohol use during sex is a risk factor for unprotected sex among both HIV-negative and positive men. Moreover, it appears that this risk may be elevated among HIV seropositive young MSM.

Trading Sex

Trading sex (sex in exchange for money, food, shelter, drugs, or other items) is a well documented risk factor for HIV-risk behavior among young MSM. Studies consistently report that engagement in sex trade is associated with unprotected sex

(Bailey, Camlin, & Ennett, 1998; Greene, Ennett, & Ringwalt, 1999; Halcâon & Lifson, 2004; Kral, Molnar, Booth, & Watters, 1997; Whitbeck, Chen, Hoyt, Tyler, & Johnson, 2004). However, less is known about trading sex and HIV-risk among HIV-positive young MSM. Some evidence suggests that HIV-positive youth are significantly more likely to engage in trading sex when compared to those who are HIV-negative. For instance, in a study of 8,000 adolescents across the United States, those who participated in sex trade were almost three times as likely as those without this risk factor to be HIV-positive (Huba et al., 2000). In the aforementioned study by Hein et al. (1995), HIV-positive adolescents were significantly more likely to report having participated in trading sex when compared with HIV-negatives (32% vs. 4%). Pfeifer & Oliver (1997) also found high rates of trading sex among HIV-infected youth. In a sample of 96 homeless youth aged 14-24 in Hollywood, California, researchers found that those who tested HIV-positive were significantly more likely to trade sex for money or drugs, and also to engage in unprotected vaginal and receptive anal sex when compared to uninfected youth.

Based on the few studies exploring trading sex among HIV-positive young MSM, it is clear that these men are engaging in high rates of sex trade when compared to their uninfected peers. It appears that young HIV seropositive MSM are also having unprotected sex. However, it is not known whether HIV-positive young MSM who engage in trading sex are more or less likely to participate in unprotected sex. Due to the fact that most HIV-negative or unknown serostatus MSM participating in trading sex often report high numbers of sexual partners (Haley, Roy, Leclerc, Boudreau, & Boivin,

2004). HIV-infected MSM who trade sex could be contributing significantly to the spread of HIV if they are not practicing safer sex.

Social Support

Social support has been theorized to serve as a protective factor against negative health behaviors. For example Cohen (1988) proposed that those who provide social support render advice about healthy practices and risk reduction strategies, and also promote the practice of positive health behaviors. However, researchers have failed to find a significant relationship between social support and risky sexual behaviors among HIV-negative and HIV-positive adult men. For instance, Crepaz and Marks (2002) conducted a meta-analytic study on various predictors of unprotected sex among HIV-positive individuals. The researchers concluded that, overall, social support was not a significant predictor of risky sexual behavior. Studies specifically among young HIV-infected MSM have been less conclusive in regards to the role of social support in sexual risk taking behaviors. For example, the San Francisco Young Men's Health survey did not find a significant relationship between social support and risky sexual behavior among participants; social support did not predict unprotected anal intercourse for those who perceived themselves to be HIV-positive or HIV-negative (Hays et al., 1997). Another study comparing HIV-positive and HIV-negative youths aged 12 to 21 receiving inpatient and outpatient medical services found that the role of social support did not predict differences in sexual risk behavior between HIV-positive and HIV-negative participants (Hein et al., 1995). Consistent with these findings, Stein, Rotheram-Borus, Swendeman, & Milburn (2005) did not find that social support predicted sexual transmission risk behaviors in a sample of 342 youths living with HIV/AIDS in clinical

sites across four major cities in the United States. Conversely, Naar-King, et al. (2006) examined the relationship between social support for safer sex and unprotected condom use among 60 HIV-positive youth receiving medical services. The researchers found that participants who had reported greater support for safer sex were more likely to use condoms. However, general social support was not found to be predictive of safer sexual behaviors.

Although few studies found evidence for social support as a predictor of high risk sexual behavior, this issue merits further exploration because these researchers have defined social support differently. The studies above provide evidence that emotional support (Hein et al., 1995) and general support (Stein et al., 2005), did not predict sexual risk among young HIV-infected men. However, social support specific to sexual behaviors has been shown to significantly predict condom use (Naar-King et al., 2006).

Peer Norms

Peer norms have also been found to be protective factors against negative outcomes for HIV-positive youth. There is an abundance of research suggesting that peer norms play a protective role against risky sexual behaviors among both adult and young MSM (Kalichman, Kelly, & St. Lawrence, 1990; Somlai, Kalichman, & Bagnall, 2001). Fisher (1988) proposed that individuals tend to practice safe sex to the degree that it conforms to the norms of their particular reference group. However, the role of peer norms in protecting against high risk sexual behaviors among young HIV-positive MSM is unclear. For instance, the San Francisco Young Men's Health Study did not find social norms to be predictive of unprotected anal intercourse for HIV-positive or untested young

men (Hays et al., 1997). Countering this research, Stein et. al, (2005) did find a direct significant relationship between unprotected sex and negative peer norms.

The preceding two studies discussed are the only published research investigating the relationship between peer norms and risky sexual behavior among young, HIV-positive males. Both of these studies used different measures of peer norms, thereby limiting our ability to draw any compelling conclusions. The San Francisco Young Men's Health Study only used one item to measure perceived social norms regarding safe sex. The latter study by Hayes et al. (1997) employed the Inventory of Socially Supportive Behaviors, which was a general index of negative peer norms regarding alcohol use, drug use, and promiscuity. Further investigation into the role of peer norms in sexual behaviors of young HIV-positive men is needed.

Education

The relationship between educational attainment and participation in unprotected sex has been documented in a variety of different populations (Hasnain, Levy, Mensah, & Sinacore, 2007; Kelly, Sikkema, Winett, Solomon, & et al., 1995; Paasche-Orlow, Clarke, Hebert, Ray, & Stein, 2005). While it is clear that education plays a role in risky sex among HIV-negative MSM, it is unclear whether this same relationship is true for HIV-positive MSM. In the study conducted by Hays et al. (1997) with young MSM, HIV-negative men who received fewer years of formal education were more likely to engage in UAI. However, an opposite pattern emerged among the HIV-positive men; increased educational attainment was associated with higher rates of UAI. Contradicting these findings, one study of adult HIV+ MSM reported that those without education

beyond high school were more likely to have participated in UAI during the previous year (Denning & Campsmith, 2005).

Educational attainment may play a role in engagement of unprotected sex for several reasons. First, men who are less educated may have more difficulty accessing and comprehending HIV prevention information. Second, less educated people are more likely to hold misconceptions about what sexual behaviors are safe, and which are not (LeBlanc, 1993; Salmon, Wooten, Gentry, Cole, & Kroger, 1996). Thus, these individuals may make themselves vulnerable to HIV infection by naïve engagement in risky sex. Last, less educated MSM may have poor sexual communication skills. HIV-positive men who are able to effectively discuss issues related to safer sex with their partners have been found to be less likely to engage in unprotected intercourse (Semple, Patterson, & Grant, 2000). More research is needed in order to better understand the role of education in rates of high risk sexual behaviors among young HIV-positive MSM.

Employment

It is well documented that MSM who are HIV-infected are less likely to be employed when compared to HIV-negative MSM (Harawa et al., 2004). This is especially the case with HIV-positive men who are at more advanced stages of HIV-infection and are physically incapable of working (Kass, Munoz, Chen, Zucconi, & Bing, 1994; Vitry-Henry, Penalba, Beguinot, & Deschamps, 2002). Less is known, however, about the relationship between employment and risky sexual behaviors among young HIV-infected MSM. In fact, only one study has explored the relationship of unprotected sex and unemployment among HIV-positive MSM (Parsons, Halkitis, Wolitski, Gomez, & Seropositive Urban Men's Study, 2003). However, the authors of this study reported a

null relationship between employment status and risky sexual behaviors. Currently, there is no published research exploring the role of employment status and sexual behaviors among younger samples of MSM. More research is critically needed in order to better understand employment status and how it could impact HIV-positive men's sexual behaviors.

Exposure to HIV prevention Messages.

Exposure to HIV prevention messages may serve as a protective factor against HIV-risk behaviors among MSM. Theory-based prevention initiatives have been successful at reaching gay and bisexual men (Goldbaum et al., 1998) and have been implicated in reducing risky sexual behaviors (Herbst et al., 2005). However, it is not known whether exposure to HIV prevention messages has the same efficacy in reducing unprotected sex with young HIV-positive MSM.

Summary

Young MSM are becoming infected with HIV at a disproportionately higher rate than other groups within the US population. Young HIV-positive MSM, in particular, may be at high risk for transmitting the virus to others. Yet, prevention programmers and researchers have typically focused on the sexual risk behaviors of HIV-negative individuals. Historically, the primary vehicle for prevention with HIV-positive people has been through HIV testing and one-time pre-test/post-test counseling. Unfortunately, research suggests that testing and counseling alone is insufficient to have a long-term impact in reducing risky sexual behaviors.

In terms of research on young HIV-infected MSM, only a few studies have explored the patterns of sexual risk behaviors of this population. The few studies that

have been conducted with this population have produced contradictory results. Furthermore, little is known about the role of risk and protective factors for unprotected sex among young HIV-positive MSM. With thousands of new cases of HIV infection each year, it should be an important public health priority to develop prevention programming for this population. More research is needed to better understand the risk profiles of young HIV-positive MSM. Such information may be useful in creating prevention programs that are specifically tailored to the needs of these men.

Research Questions & Hypotheses

In an attempt to increase our understanding of HIV-positive young MSM, the proposed study will: 1) describe the sexual risk behaviors of HIV-infected young MSM, 2) compare rates of engagement in HIV-risk behaviors between HIV-negative and HIV-positive young MSM, 3) identify risk and protective factors associated with unprotected sex among HIV-positive young MSM, and 4) explore the degree to which risk and protective factors for unsafe sex among HIV-positive young MSM explain unsafe sex among HIV-negative young men.

The proposed study will address the following hypotheses and exploratory research questions:

Q1: Do HIV-positive and negative young MSM engage in similar risk behaviors and at similar rates?

H1: Current research supports the hypotheses that young HIV-infected MSM will engage in equal or higher rates of unprotected anal intercourse when compared to HIV-negative MSM. Consistent with the available literature, I hypothesize that

rates of high risk sexual behavior will not differentiate HIV-positive and HIV-negative participants.

Q2: What factors encourage and protect against engagement in unprotected anal intercourse among young HIV-positive men?

H2: Among HIV-positive young men, as educational attainment increases, the proportion of men who report unprotected anal intercourse will decrease, controlling for age.

H3: Self-identified HIV-positive young MSM reporting employment will be less likely to engage in risky sexual behaviors than their HIV-positive peers who are unemployed.

H4: Research suggests that individuals tend to practice safer sex to the degree that it conforms to the norms of their reference group (Fisher, 1988). Therefore, young MSM who identify as HIV-positive and who have greater peer support for safer sex will be less likely to participate in unprotected anal sex than young HIV-positive MSM who have lower scores on peer norms.

H5: Social support has been theorized to serve as a protective factor against negative health behaviors (Cohen, 1988). Thus, young MSM who identify as HIV-positive and who have greater social support for safer sex will be less likely to report unprotected anal intercourse than HIV-infected young MSM who report lower rates of social support.

H6: HIV-positive young MSM who used alcohol or drugs during their last sexual encounter will be more likely to engage in unprotected sex than HIV-positive young MSM who did not use substances during their last sexual contact.

H7: Young MSM who are HIV-positive and who have participated in trading sex within the past year will be more likely to engage in unprotected anal intercourse than HIV-positive young MSM who do not report having traded sex.

Q3: Do the same factors protect and put at risk HIV-positive and HIV-negative young men?

There is insufficient research comparing HIV-positive and HIV-negative young MSM in terms of risk and protective factors for risky sexual behavior to formulate hypotheses. For the purposes of this study, comparisons of risk and protection will be pursued in an exploratory manner.

Chapter 2

Method

The proposed study uses data from the Community Intervention Trial for Youth (CITY) Project. The CITY project was a 7-year randomized multi-site control trial of interventions to reduce HIV-risk behaviors among young MSM between the ages of 15-25. Using venue-based time-space sampling (TSS) (Muhib et al., 2001) CITY recruited a community based, multi-ethnic probability sample of young MSM from 13 different urban locales across the United States. Data were collected on young men's sexual risk behaviors and predictors of risk via an anonymous interview.

Sample

To be eligible to participate in the CITY Project, men had to be between the ages of 15 to 25 years and report that they had engaged in sexual activity with another man in the previous year. In addition, men had to meet racial eligibility criteria applicable to the particular study site at which they were recruited. The 13 sites for the CITY Project were geographically diverse, representative of most regions throughout the country, and had venues where it was possible to obtain a multi-ethnic sample of young MSM. Cities were divided into four strata based on race/ethnicity (see Table 1).

The study utilized a venue-based application of TSS (Muhib et al., 2001). CITY researchers at each site identified venues that were likely to be frequented by young MSM through key informants and gay-oriented magazines and newspapers. Through a systematic process, sites identified venue-day-time units (VDT) that were optimal for collecting data from young men. These VDT units comprised the sampling frame. VDTs were then randomly selected for data collection (See Muhib et. al., 2001 for a thorough

discussion of TSS). Randomization occurred once each month. Data were collected in each site from May through August in the years 1999, 2000, 2001, and 2002[1].

Procedures

Data collection procedures and processes for obtaining informed consent were reviewed and approved by the relevant human subjects review committees at each of the 13 study sites and also the Centers for Disease Control and Prevention. During data collection events, staff systematically approached young men who exhibited physical characteristics consistent with the race and age requirements at each site. In order to determine eligibility, a brief screening instrument (BSI) was administered to each individual who was approached. Interviewers read the questions aloud to each respondent. Participants were eligible to be interviewed if they were between the ages of 15 and 25, had sexual contact with a male in the previous year, were a resident of the catchment area, and met the racial/ethnic requirements of the site. Sexual contact was defined as participation in oral sex, anal sex, or any other physical contact leading to orgasm. Once eligibility was determined, potential respondents were asked to participate in a 20-minute interview and informed consent was obtained. Interviewees were paid $10-$20 (depending on the site) as an incentive for their participation in the study. Participation was anonymous. Altogether, 37,004 men were approached and 27,361 (74%) agreed to be screened. Of those, 12,525 (46%) met the criteria for inclusion and 11,779 (94.3%) of those men agreed to be interviewed. The current study will only use data from MSM who reported to have been tested for HIV and to have received their results. Thus, the final analytic sample contains 8,384 young MSM.

Measures

The anonymous face-to-face interview protocol appears in Appendix A. Only those measures that were used in the current analyses are described.

HIV Serostatus

HIV status was assessed by first asking "Have you been tested for HIV"? If the respondent replied affirmatively, he was asked, "Would you be willing to tell us the results of the last test"? Responses were coded into 7 categories: 1 (HIV-positive), 2 (HIV-negative), 3 (never tested/unknown), 4 (indeterminate), 5 (didn't get results), 6 (don't know), and 7 (refused).

For the current analysis, HIV status was dichotomized into an HIV-negative group and an HIV-positive group. A total of 8,932 men reported a negative HIV-test result and 163 were HIV-positive. Those who were not tested (n = 2274), who didn't return to get their results after testing (n = 180), who didn't know their serostatus (n = 103), or who refused (n = 51) were excluded from all analyses. Fifteen men reported to have received an indeterminate test result and were added to the HIV-positive sample. This was done because the men with indeterminate HIV status were similar to HIV-positive men after examining their rates of risky sexual behaviors. Also, under the CDC guidelines for HIV testing and counseling, individuals who receive an indeterminate test result and report a history of high risk sexual activity should receive post-test counseling similar to those who receive a seropositive test result (CDC, 2001) because these men report risky sexual behaviors[3]. After adding these participants, the sample of HIV-positive men included 178 men.

Socio-demographics

Age. Young men were asked for their date of birth and also how many years old they were. For the purposes of all analyses, age was treated as a continuous variable measured in years. The mean age of the sample was 22 (sd = 2.26) and ranged from 15 to 25.

Race and ethnic background. Race/ethnicity was measured by two questions: "What is your ethnicity?" and "How would you describe your racial background?" The first question was coded as 1 (Hispanic or Latino) or 2 (Not Hispanic or Latino). Racial background was coded as Black, Latino, Asian American/Pacific Islander, White, American Indian, Mixed, or unknown. In preparing these data for analysis, Asian American/Pacific Islander, American Indian, multi-racial, and men reporting their race to be unknown were combined into a single variable named "other race." Dummy variables were then constructed with "other race" serving as the reference category and separate variables were created for Black, White, and Latino.

Educational attainment. Young men were asked to report how many years of school they had completed. For analyses, education was coded into 5 categories: 0-6 years, some high school (7-11 years), high school graduate (12 years), some college (13-15 years), and college graduate (16 or more years).

Employment. Employment was assessed and coded into the following categories: Full time, part time, not working because of disability, not employed but looking for work, not employed and not looking for work, or not employed but receiving unemployment benefits. For the current study, this variable was dichotomized so that a code of 0 reflected not being employed and a code of 1 indicated part or full-time employment.

HIV-risk Behaviors

HIV risk sexual behaviors were assessed for three different time frames. MSM were asked about their sexual risk practices within the last year, within the past three months, and during their last sexual encounter.

Sexual risk behaviors within the past year.

Trading sex. Participants were asked if they had traded sex for money, drugs, or anything valuable (i.e. food, or a place to stay). Responses were coded 1 for yes, and 0 for no.

Sexual risk behaviors in the past three months.

UAI with male partners. This measure assessed whether the respondent had engaged in UAI within the previous three months. If the respondent endorsed participating in anal sex, he was asked to report the number of occasions in which he was the receptive partner and the number of times when he was the insertive partner. The men were also asked to report the number of times that condoms were not used during these sexual encounters. An example of items from this measure include "In the past three months, how many times have you had anal sex with men, where you were the inserting partner, and you did not use a condom"? Those respondents who engaged in anal sex but did not use a condom were coded 1 on this variable. Men reporting one or more occasions of receptive or insertive anal sex without a condom were coded 0. Those who did not report having participated in any anal sex within the previous three months were excluded from analysis.

Unprotected sex with female partners. Respondents reported whether they had engaged in vaginal sex or anal sex with women within the past three months. If so,

participants were also asked whether condoms were used "from start to finish." For the current analyses, a variable was created to reflect whether the participant had or had not engaged in any unprotected sex with a woman. A code of 1 indicates that a man had anal or vaginal sex without a condom. A code of 0 reflects no unprotected sex with a woman. Those who had not had any sexual contact with women were excluded from analysis.

Total number of sex partners. Men were asked to report the number of different male partners with which they had any anal sex without a condom within the past three months. In order to reduce bias due to extreme outliers, this variable was truncated into three categories: 0 partners, 1 partner, or more than two partners.

Most recent sexual encounter.

UAI with Main and Non-main Partners. Men were asked a series of questions regarding their sexual activities with main and non-main partners during their last sexual encounter. For this study, a main partner was defined as, "any man you consider to be your main male partner, like a lover or a boyfriend" while non-main partners were described as "any man you do not consider to be your main partner." For each partner type, men were then asked whether they had engaged in either receptive or insertive anal sex within the past year. Responses were coded 1 for yes, and 0 for no. If yes, they were asked whether they (or their partners) used a condom "from start to finish" during the last time they had sex. Responses were coded 1 for yes, and 0 for no.

For the current analyses, two variables were created: "UAI with Main Partners" and "UAI with Non-main Partners." For "UAI with Main Partners," a respondent was assigned a 1 if he reported less than perfect condom use with main partners and a 0 was given to those using condoms 100% of the time. Men who did not have any main partners

were excluded from analysis. For "UAI with Non-main Partners," men reporting inconsistent condom use were coded as 1 while those who used condoms during every sexual encounter were coded as 0. Those who did not have a non-main partner were excluded from analysis.

Sex under the Influence of Alcohol or Drugs with Partners. This dichotomous variable assessed engagement in sex while under the influence of alcohol and/or recreational drugs. For both non-main and main partners, respondents were asked "Were you high on drugs or alcohol the last time you had sex with him?" Responses were coded 0 for no and 1 for yes.

In order to prepare this variable for regression analyses, a new variable was created to reflect whether the participant had sex while high with main partners and/or non-main partners. Thus, if a participant said yes to using alcohol or drugs to either of these questions, he was assigned a 1. Conversely, if he replied no to both of these questions, he was given a value of 0.

Knowledge of Partners' HIV Status. The question "The last time you had sex with him, did you have an idea what his HIV status might be?" was asked regarding main and/or non-main partners. Reponses were coded 0 for no and 1 for yes.

Communication about Safer Sex. In reference to main and/or non-main partner, men were asked "And the last, most recent time you had any kind of sexual contact with him, did you communicate with him in any way about using a condom when you had sex that time?" A yes response was coded as 1 and no was 0.

Peer Norms about Condoms

Four questions determined how the participants' friends felt about using condoms. These items were adapted from a longer scale developed by Choi, Coates, Catania, Lew, & Chow (1995). Example items include "Most of my friends are using condoms these days when they have anal sex" and "Most of my friends think you should always use condoms when having anal sex with a new partner." Participants were asked to rate how much they agreed or disagreed with these statements using a Likert scale ranging from 1, agree strongly, to 4, disagree strongly. These scores were combined into a single index ranging from 4 to 16 with higher scores reflecting stronger peer norms for condom use. Only the scores of those who answered at least three of these questions were included in the analyses. For this sample, the mean for peer norms about condoms was 12.94 (sd = 3). Cronbach's internal consistency alpha was adequate (α =.75).

Social Support

A four question index of available social support for safer sexual behaviors was included in the interview. These items were adopted from Miller (1995). Respondents rated the extent of available social support regarding issues related to sex, such as having someone with whom they could share concerns about AIDS, on a 5-point scale ranging from 1=none of the time to 5=always or all of the time. Item responses were summed so that scores could range from 4-20. High scores indicate high levels of sexual social support. Only the scores of those respondents who provided answers to at least 4 of these questions were included in the analyses. The mean score was 15.86 (sd = 4). Cronbach's internal consistency for this sample was acceptable (α = .83).

Exposure to HIV Prevention Interventions

This measure included four items assessing the degree of exposure to AIDS prevention. Each item described a prevention initiative. Examples of AIDS prevention interventions were workshops, social events/parties, education or outreach, flyers or pamphlets, and radio, newspaper, or TV marketing. For each item on this measure, participants were asked if they were exposed to the intervention. For example, one of the items read "In the past six months, have you participated in any workshops about AIDS prevention." For the current analysis, a new variable ranging from 0 to 4 was created reflecting the total number of intervention exposure types. For example, a respondent who reported any exposure to workshops and social events/parties but did not endorse exposure to the other two intervention types received a value of 2 for this variable.

Data Analysis

To prepare data for analyses, the frequency distributions for all study variables were examined to identify potential problems (e.g. outliers and missing data). Following examination of the data for missing and distributional properties, descriptive statistics were run, including means and standard deviations, in order to examine the characteristics of the sample and to compare the characteristics of the positive and negative men on age, race, education, employment, HIV status, sexual behaviors, social support, peer norms, substance use, and engagement in trading sex. See appendix B for a detailed description of the data cleaning process.

In addressing research question I, the reported rate of several HIV-risk behaviors between the positive and negative men in the sample were compared using Pearson's Chi-square test of independence for categorical variables and a dependent t-test for continuous variables. For research question II, only respondents who self-identified as

HIV-positive were included in these analyses. Sequential logistic regression, in which the dependent variable was UAI within the past three months was employed. In the 1st step of this analysis, I controlled for the effects of age, race, education, and employment. The 2nd step included social norms, social support, exposure to prevention messages, substance use, and trading sex. The Chi-square likelihood ratio determined the overall significance of the model. In addition, the Wald statistic identified which predictor variables made a significant impact on the dependent variable after controlling for age and race. Odds ratios and confidence intervals were also included.

Finally, in order to explore potential differences in risk and protective factors for unprotected sex between HIV-positive and HIV-negative participants, an identical logistic regression model was run, including only the HIV-negative participants. Identical test statistics used for the previous analyses were employed to determine the significance of the model and the impact of each individual predictor variable on the dependent variable. In exploring the differences between the two models, the model fit of the data, the direction of effects, and whether the models had similar strength were investigated.

Chapter 3

Results

Descriptive analyses of predictor and outcome variables were performed. Comparisons were made on socio-demographic variables between the two serostatus groups. The chi-square likelihood ratio test and t-test were used in the analysis of categorical and continuous variables. As table 2 indicates, HIV-positive men were significantly older than HIV-negative men. There were also significant race differences between the two groups. For instance, a much larger percentage of the men in the HIV-positive sample were African American and the minority were white. There were also differences in rates of employment: HIV-positive men were less likely to be working when compared to those in the HIV-negative group. Finally, there were no differences between the two groups regarding sexual orientation with most of the men in the sample reporting to be gay or bisexual.

Chi-square tests for categorical variables and t-tests for continuous variables were used to identify which HIV-risk behaviors were associated with HIV-status. The likelihood ratio for chi-square was used to determine statistically significant relationships between the variables. To detect whether differences between means for continuous variables were statistically significant, the obtained t was compared to the critical value (Keppel & Wickens, 2004). As shown in table 3, HIV-positive men reported significantly greater sexual risk on three variables. HIV-positive men were more likely to have traded sex within the past year when compared to HIV-negative MSM. In addition, having sex while under the influence of alcohol or drugs was also more common among these men. However, this was only true within sexual encounters with main partners; having sex

while intoxicated with non-main partners was not significantly associated with UAI. Finally, HIV-positive young men reported to have had UAI with a greater number of partners when compared to their HIV-negative peers. On the remaining nine variables, there were no significant differences in risk behaviors between the two groups. It should be noted that the relationship between HIV-status and UAI or UVI with women could not be analyzed because the number of HIV-positive men engaging in this activity was too small. Tabachnick & Fidell (2007) recommend a minimum of 5 observations per cell when performing the chi-square likelihood ratio test.

Sequential logistic regression was employed to examine the impact of risk and protective factors on engagement in UAI among HIV-positive men. Bivariate correlations for all variables included in the following regression models are reported in table 4. Sequential logistic regression was chosen for these analyses because binary variables can be used as the dependent and predictors can include both categorical and/or continuous variables. Logistic regression is also robust to a variety of assumptions: it does not require normal distributions, does not assume linearity of relationships between variables, and does not presuppose homoscedasticity (Tabachnick & Fidell, 2006)..

For the first logistic regression analysis, only HIV-positive MSM were selected. Any UAI in the past three months served as a dichotomous outcome while socio-demographic variables were entered in the first step. These indicators included age, race, education, and employment[2]. The second step included social norms, social support, exposure to prevention, trading sex, and substance use during sex as predictor variables.

Among the HIV-positive sample, 11 cases with missing data on predictor variables were deleted. An additional 29 men were excluded from analysis since they did

not report engaging in any anal sex within the previous three months. Thus, 131 cases were available for analysis. Evaluation of adequacy of expected frequencies for categorical predictors did not warrant restricting the model goodness-of-fit tests. No serious violation of linearity in the logit was observed.

The chi-square likelihood ratio test was used to test the differences between the steps entered in the sequential logistic analyses. The model chi-square is reported for each step, which determined whether the likelihood ratios (-2LL) significantly differed between the two steps. Although there is no statistic in logistic regression that is directly equivalent to a linear regression R^2, Nalgelkerke R^2 provides a measure indicating the strength of model fit (Field, 2005). The Wald test was used in order to test the significance of individual model parameters.

Table 5 shows regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for odds ratios for each step within the model. As seen in the table, the first step containing age, race, education, and employment was not statistically significant and therefore was not associated with UAI among the sample of HIV-positive men. However, after adding peer norms, social support, exposure to prevention, trading sex, and substance use, the full model was statistically significant. Thus, the predictors, as a set, reliably distinguished between those HIV-positive men engaging in UAI and those who did not report UAI. According to Wald criterion, both peer norms and social support were associated with engagement in UAI within the past three months. Young MSM reporting greater peer norms for condom use were 1.13 times less likely to have engaged in UAI. Also, those who reported increased social support for safer sex were 1.17 times likely to have abstained from UAI within the past three months.

The next analysis sought to determine whether the same factors protected or put at risk HIV-negative young MSM. In accord, an identical sequential logistic regression as described above was performed with only the HIV-negative respondents. Next, the logistic regression analysis with the HIV-positive men was compared to the analysis with the HIV-negative men in order to determine whether different significant predictors emerged between the two serostatus groups.

The logistic regression analysis with HIV-negative respondents included 6,667 men after 258 cases were removed because of missing data and 1,279 men were excluded because they had not had anal sex within the past three months. Regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for odds ratios for the full model appear in Table 6. The first set of socio-demographic variables, as a set, significantly predicted UAI. However, race and employment were the only statistically significant predictors of UAI. Both Hispanic and Black MSM were more likely to have abstained from UAI than those in the "other race" category. Furthermore, employed men were less likely to have had UAI. After the addition of the second step, the full model with all the variables significantly predicted UAI. Race remained significant after the second step was added, although the effect of employment on UAI did not. Within the second step, peer norms were the only significant variable associated with UAI. HIV-negative men who reported greater peer norms for condom use were 1.12 times less likely to have had UAI within the prior three months.

In comparing the two logistic regression models, UAI was explained by mostly different variables. The only common factor associated with UAI between the HIV-positive and the HIV-negative groups was peer norms for condom use. Those reporting

positive peer norms for condoms were less likely to engage in UAI regardless of HIV status. Social support for safer sex was a significant predictor of UAI for the HIV-positive men but this relationship was insignificant for HIV-negative men. Conversely, race was only a significant predictor of UAI for the HIV-negative men. Finally, in comparing the Nalgelkerke R^2 statistics between the two logistic regression analyses, it appears that the predictor variables better explain the variance in UAI for the HIV-positive group, then for the HIV-negative group.

Chapter 4

Discussion

Until recently, prevention initiatives have focused their efforts on HIV-negative men under the guiding assumption that individuals will change their high risk sexual behaviors in light of receiving an HIV-positive diagnosis. However, findings from this study suggest that HIV-positive MSM are an important target for prevention interventions. Young men living with HIV/AIDS are indeed having unsafe sex. Our findings indicate that nearly 40% of HIV-infected men and 34% of HIV-negative MSM reported to have engaged in UAI within the previous three months. Furthermore, we assessed several other indicators of sexual risk between the two serostatus groups and few differences emerged. These data demonstrate that knowledge of one's HIV status may not contribute to the sexual decision making among many young MSM.

Similarities among HIV-positive and HIV-negative MSM

Young men, regardless of serostatus, are developmentally similar, which may play an important role in their sexual risk taking behaviors. One possible explanation for the high rates of risky sex among young MSM is that they often feel invincible to the potential negative consequences of unprotected sex. It is considered normal for men in their late teens and 20's to feel that they are not vulnerable to adverse events (Kreipe, 1985). Thus, young HIV-negative men, aware of the risks of sexually transmitted infections, may have unprotected sex with the attitude suggesting "it won't happen to me". For the same reasons, HIV-positive men may feel that they will not actually transmit the virus to their partners. These developmental differences may partly explain

our finding that HIV-positive and HIV-negative MSM were equally as likely to engage in UAI.

Young men may also engage in unprotected sex because of the tremendous challenge they face in negotiating safer sex. Our data show that sexual communication is a problem for men in both serostatus groups with 40% of HIV-negative MSM and 39% of HIV-positive MSM reporting that they did not talk about safer sex with non-main sexual partners. Previous research has found that young gay and bisexual men who engage in unprotected sex are also likely to have poor communication skills with sexual partners (Hays, Kegeles, & Coates, 1990; Molitor, Facer, & Ruiz, 1999). These young men may lack the experience and communication skills necessary to resist the pressures to have unprotected sex. Such barriers to safe sex communication are difficult to overcome for both HIV-positive and HIV-negative men. The experience of receiving an HIV-test result does not help young men acquire better communication skills.

Young MSM may also participate in UAI because they are highly sensitive to peer influences. In the current study, peer norms for safer sex was protective against engagement in UAI for both HIV-negative and HIV-positive men. Consistent with Stein et al. (2005), increased peer norms for safer sex were associated with lower rates of UAI among the HIV-positive and HIV-negative young men in our sample. The impact of peer norms on condom use is not surprising. According to Fisher (1988), young men care about the perceptions of others and will act in ways to retain good standing with their friends. Fisher advocates that people adhere to group norms in fear of the sanctions that that can result from nonconformity. While the impact of peer norms on sexual behaviors can be beneficial, it also presents challenges to HIV/AIDS prevention. For example, the

impact of peer norms can be positive in situations where peers hold positive attitudes towards using condoms. Men a part of these peer groups are more likely to use condoms if they feel that their peers will judge them unfavorably if they do not use them within their own sexual encounters (Fisher & Misovich, 1990). On the downside, when men believe that safer sex is not supported among their peers, they are less likely to use condoms (Kelly et al., 1995). It is imperative the prevention programming place particular emphasis on promoting positive norms around safer sex communication and condom use.

The final important similarity detected in our main analyses was relevant to the helpfulness of prevention among these men. Our findings indicated that most individuals in our sample were exposed to at least one form of HIV/AIDS prevention within the previous three months. The most commonly reported prevention messages were flyers promoting safer sex (73%) and contact with outreach workers (44%). However, despite high rates of intervention contact, there was no association between exposure to prevention and rates of UAI among men in either of the serostatus groups. One possible explanation for this finding is that men were most commonly exposed to the types of interventions that may be least effective. For instance, participation in safer sex workshops could be more effective in changing sexual risk behaviors than being exposed to flyers or having contact with outreach workers. It is possible that prevention exposure did not predict UAI among these men because these individuals are most commonly reached by forms of prevention that are less potent in their ability to bring about behavioral change. However, no previous research has directly compared the effectiveness of each of these types of interventions. Although our measure of prevention

exposure was crude, these findings do suggest that typical prevention activities may be limited in their ability to reduce rates of unprotected sex among young MSM on a broad scale. New strategies may be needed in order to reduce rates of unprotected sex with young MSM.

Differences between HIV-positive and HIV-negative men

Although our findings identify many similarities among HIV-positive and HIV-negative men, there were important differences between these groups. Race was an important factor in predicting UAI for HIV-negative men, but not for those who were HIV-positive. In addition, HIV-positive men were riskier on some indicators of sexual behavior. Finally, social support for safer sex was protective against UAI for those men who were HIV-infected.

Among the HIV-negative MSM, Blacks and Hispanics were the least likely to have participated in UAI while men in the "other race" category were at the highest risk for UAI. Previous research confirms that Black MSM are less likely to participate in UAI when compared to men in other ethnic groups (Harawa et al., 2004). The relationship between high risk sexual behavior and racial status is paradoxical. While Blacks and Hispanics report high rates of HIV-infection, they are less likely to report unprotected sex (CDC, 2006, Valleroy; Mackeller, & Karon, 2000; Lemp, Hirozawa, Givertz, et al., 1994). Misconceptions held by the public often attribute this discrepancy to injection drug use. However, IDU was low in our sample (2.3%) and was unrelated to HIV status. Black and Hispanic MSM who contract HIV in this age group are mostly likely to have acquired the virus through unprotected sex.

In a recent literature review, Millett, Peterson, Wolitski, & Stall (2006) sought to explain why men in the Black community experience disproportionately higher rates of HIV in comparison to men in other racial groups. In reviewing the research from the very beginning of the HIV/AIDS epidemic, the authors concluded that Black MSM do not engage in higher rates of UAI when compared to MSM in other racial groups. Thus, less obvious factors are attributed to the spread of HIV among this population. In exploring these factors, strong scientific support was found for two of the authors' hypotheses. First, Black MSM are more likely to acquire other sexually transmitted diseases which make them especially vulnerable to contracting HIV. Second, Black MSM are less likely to know their HIV-status so they may unknowingly expose others to the HIV virus. Based on these findings, testing and treatment for sexually transmitted diseases is an important factor in reducing HIV-infection among black men.

Men who were part of the "other race" category in our study engaged in the highest rates of UAI. These individuals were largely Asian Americans. The impact of HIV/AIDS among Asian American men is perplexing. While these men have experienced the lowest rates of HIV-infections when compared to men in other major ethnic groups in the United states (CDC, 2005), they report high rates of UAI (Choi, Coates, Catania, Lew, & Chow, 1995). Researchers have proposed several explanations for this discrepancy. For instance, It has been suggested that the prevalence of HIV/AIDS among Asian American MSM is underestimated because these individuals are less likely to get tested for HIV when compared to men of other ethnic groups (Kahle, Freedman, & Buskin, 2005; Zaidi et al., 2005). Published reports of HIV/AIDS rates for this population may also be unreliable because Asian Americans tend to be misclassified into different

racial groups within medical records (Zaidi et al., 2005). Finally, it has been proposed that Asian American men are less likely to become infected with HIV due to their sexual mixing patterns. For example, Choi, Operario, Gregorich, & Han (2003) found that Asian men were most likely to have unprotected sex during sexual encounters with men from their own ethnic group. Conversely, when having sex with men who were not Asian American, they tended to practice safer sex.

It should be noted that Asian Americans were underrepresented in our sample of HIV-positive MSM. With a larger sample of Asian Americans, the relationship between race and UAI may also be significant for HIV-positive men. Therefore, future studies employing larger samples of HIV-positive men from this population is needed in order to better understand the role of race in sexual risk taking behaviors among HIV-positive MSM.

In addition to differences related to race, significant variations emerged between the two serostatus group on indicators of sexual risk. Consistent with similar studies, we found that HIV-positive men were more likely to have engaged in UAI with a greater number of partners when compared to those who reported to be HIV-negative (Hays et al., 1997; Valleroy et al., 2000). In addition, we found that HIV-positive MSM were more likely to have traded sex for food, money, drugs, or a place to stay when compared to uninfected men. This finding is also supported in the literature (Hein et al., 1995; Huba et al., 2000; Pfeifer & Oliver, 1997). Previous research suggests that sex trade is an economic survival strategy because of its association with homelessness and economic criminal behaviors among young HIV-infected MSM (Greene et al., 1999). This may also be true of the men in our sample since HIV-infected men were more likely to be

unemployed when compared to their HIV-negative peers. Finally, similar to findings reported by Huba et. al. (2000), those who reported an HIV seropositive status were more likely to have had sex while under the influence of alcohol or drugs. While we do not have data that explain this finding, it has been suggested that HIV-positive men use substances during sex in order to increase sexual performance and pleasure (Kalichman, Weinhardt, DiFonzo, Austin, & Luke, 2002) or to facilitate avoidant coping strategies (Malow, West, Corrigan, Pena, & Cunningham, 1994).

These behaviors pose a serious threat to public health. Not only are the HIV-positive men in our sample participating in unprotected sex at high rates, they are doing this with larger numbers of partners when compared to their HIV-negative counterparts. The prevalence of sex trade among these men is also disturbing since those who engage in this activity tend to have unprotected sex with large numbers of partners (Raj, Cheng, Levison, Meli, & Samet, 2006). Finally, the alcohol and drug use occurring during sex presents a problem in that this behavior is also known to be associated with unprotected sex (Dolezal, Meyer Bahlburg, Remien, & Petkova, 1997; Hirshfield et al., 2004). HIV-positive men engaging in these behaviors have the potential to infect thousands of men.

In order to reduce rates of UAI among HIV-infected young men, effective prevention should address factors that contribute to unprotected sex. Although our data suggest that the risk and protective factors for UAI are largely similar across the serostatus groups, one major difference indicated that social support predicted UAI among HIV-positive men. The role of social support has received less attention in the HIV prevention literature. Only one previous study has explored the influence of HIV-specific social support among young HIV-positive MSM (Naar-King et al., 2006). The

current study is the first to compare HIV-positive to HIV-negative MSM using such a measure of social support. Our findings indicate that HIV-positive men who reported increased levels of social support for safer sex were less likely to engage in UAI. Thus, having individuals with whom one can discuss issues related to safer sex was especially protective for these men.

Increased social support may play a role in sexual behaviors for a number of reasons. First, it is possible that HIV-positive men who have social support are more likely to disclose their HIV-serostatus to sexual partners (Kalichman, 2003). Research shows that HIV-infected men who inform their sexual partners of their serostatus are less likely to have unprotected sex (Klitzman, 2007). Second, men who have social support for safer sex may receive informational support concerning condom use and strategies for negotiating safer sex. In turn, these individuals experience increased self-efficacy. For example, Naar-King et al. (2006) found that social support leads to greater self-efficacy, which resulted in safer sexual behaviors among HIV-infected young men.

Finally, having family and friends involved in the sexual decision making of these men may influence HIV-positive men to take the personal responsibility to protect the health of their sexual partners. In one study, Parsons, Halkitis, Wolitski, Gomez, & the Seropsoitive Urban Men's Study Team (2003) found that 25% of adult HIV-positive men saw themselves as having little personal responsibility for infecting others. In another recent article, it was found that having the belief that it is one's partner's responsibility to protect himself, rather than a personal responsibility to protect him, is associated with high sexual risk (Wolitski, Flores, O'Leary, Bimbi, & Gomez, 2007). Thus, social support may deter some men from having unprotected sex because it makes personal

responsibility more salient. When these young men go to their friends and family members for safer sex support, they may become more accountable for their actions. Thus, social support may reinforce these men to take responsibility for protecting their partners by avoiding UAI.

Future research should explore the effect of HIV-risk specific social support on disclosure, self-efficacy, personal responsibility and other factors that may mediate the relationship between social support and high risk sex.

Limitations

There are some limitations that should be considered when interpreting the results of this study. First, these results are based on self-reports. It is possible that some participants may have given us inaccurate information about their HIV-status due to fears of being stigmatized. Similarly, fears of stigmatization, as well as biases associated with social desirability may have led some individuals to have misreported information concerning their sexual behaviors. However, the likelihood of misreporting should have been reduced since participation in this study was anonymous. In addition, our results are consistent with other studies using similar sampling and methodological procedures.

Second, we cannot assess the causal impact that an HIV diagnosis has on sexual behaviors. Since we do not have longitudinal data pertaining to the sexual behaviors of men before and after their diagnosis, it is not possible to determine the exact impact of serostatus on sexual behaviors. The HIV-infected men could have become more or less risky in their behaviors post-diagnosis. For example, previous longitudinal research with HIV-positive adults indicates that individuals decrease their sexual risk behaviors immediately following HIV-diagnosis, but risky sexual behaviors tend to increase again

over time (Colfax et al., 2002; Di-Franceisco, Pinkerton, Dyatlov, & Swain, 2005). Future longitudinal research exploring the trajectory of sexual risk behaviors pre and post HIV diagnosis with young MSM is needed.

Third, because the participants in this study were not subjected to serological testing, their actual HIV status was not confirmed. Consequently, it is likely that the prevalence of HIV in this sample is underestimated. Previous researchers have reported rates of HIV infection to be between 7-19% (Hays et al., 1997; Hein et al., 1995; Valleroy et al., 2000). However, our self-reported rates of HIV infection are consistent with Valleroy et. al., (2000) who used a similar sample of young MSM and reported that 1.3% of the men perceived themselves to be HIV-positive (the self-reported rate of HIV was 2% in the current study).

Another potential limitation of this study is that we do not have data on the sexual partners of the HIV-positive men who engaged in UAI. It could be argued that men having sex with seroconcordant partners are not at risk. However, unprotected sex is a serious health threat regardless of whether or not it occurs between sexual partners with the same HIV-status since these men can contract other sexually transmitted diseases. Moreover, many people living with HIV/AIDS already have compromised immune systems, such infections can therefore be especially harmful. In addition, although it is less common, UAI can pose a threat to HIV-infected individuals in that they could become re-infected with a different strain of the HIV-virus (Jost et al., 2002; Smith et al., 2004).

Finally, it should be noted that two of the findings reported here were only marginally statistically significant. Specifically, the relationships between sex trade and

serostatus, as well as substance use and serostatus, were significant at the p = .056 and p = .06 respectively. Future research employing larger samples of young HIV-positive MSM is needed in order to confirm these results.

Implications for Prevention

The single event of receiving an HIV-positive diagnosis is not enough to change the sexual behaviors of many young MSM. In response, prevention initiatives have slowly expanded to include specific programming for HIV-positive men in recent years. These evidence-based programs have made some advances in helping HIV-positive individuals adopt safer sexual practices (Crepaz et al., 2006). However, few of these prevention programs have specifically targeted younger populations of HIV-positive MSM aged 25 and younger. Existing interventions typically approach prevention under the assumption that similar factors predict risky sexual behaviors among HIV-positive and HIV-negative individuals. Although our results demonstrated that there are both similarities and differences between HIV-negative and HIV-positive young MSM in terms of sexual risk, there were also important differences between the two groups which suggest that serostatus should be considered during the development and implementation of prevention programming.

Since peer norms for safer sex were important in reducing UAI for men in both serostatus groups, effective prevention programming should pay special attention to assisting all young MSM in forming relationships with peers who endorse the use of condoms and also use them in their own encounters. One intervention that has focused on changing peer norms among young MSM is the Mpowerment Project. Mpowerment is an evidence-based, community level program targeting young MSM. The peer-based

component of this program attempts to mobilize young MSM to talk to their friends about safer sex (Hays, Rebchook, & Kegeles, 2003; Kegeles, Hays, Pollack, & Coates, 1999). Interventions such as the Mpowerment Project are guided by the diffusion of innovation theory (Rogers, 1995). Other interventions based on this theory have also been effective in reducing risky sex by changing peer norms through the recruitment and training of opinion leaders who serve as safer sex endorsers within their social networks.

Differences between HIV-positive and HIV-negative men that emerged in this study suggest that HIV-prevention programs for young MSM may be enhanced by addressing serostatus specific issues. For instance, a large majority of young MSM living with HIV/AIDS are African American or Hispanic suggesting that HIV-prevention programs should be sensitive to cultural issues around sex and sexuality. In addition, prevention for HIV-positive young MSM should place special emphasis on helping young MSM expand their networks of social support to include family and friends with whom they can discuss issues related to safer sex. Although there are family-level interventions that typically aim to increase communication in regards to HIV and other sexually transmitted diseases (DiClemente, Salazar, & Crosby, 2007), these types of programs tend to target adolescent populations rather that young HIV-positive MSM.

Conclusions

Unfortunately, the rate of new HIV diagnoses among young MSM aged 25 and under is growing rapidly. With an increasing number of young men who are living with HIV/AIDS, the prevention needs of this population must be addressed. Future directions in research should explore developmental, cultural, and social needs of this population.

APPENDIX A

QUANTITATIVE INTERVIEW (QTI) CITY Study - October 26,1998

The QTI is to be completed only for consenting eligible YMSM as defined by BSI.

Start time: _____ : ____ *am/pm*
hour *minute* (circle one)

A. Demographics

A1. ***What is your date of birth?*** _ __/_ _/_ __
mm *dd* *yy*

A2. ***What zip code do you live in?*** ___ _____

A3. ***How many years of school have you completed?***

_____ *years* (examples: "finished high school"=12, "bachelors degree"=16)

A4. ***Are you currently enrolled in school, or were you enrolled last year?*** (Prompt: ***Full or part time?,)*** (Note: By "last year," we mean the academic year that started in the fall of 1998 and ended in the spring of 1999.)

1) Yes, Full time student
2) Yes, Part time student
3) No

A5. ***How would you describe your current work situation?***

1) Full time paid job (at least 30 hours/week)
2) Part time paid job (less than 30 hours/week)
3) Not working because of disability
4) Not employed, looking for work
5) Not employed, not looking for work
6) On unemployment (receiving unemployment benefits)
7) Other (Specify:_____)
8) Refused

A6. ***Were you born in the United States?***

1) Yes

A6a. ***In what city and state were you born?***

*City*_____, *State* _____ (Skip to question A9)

2) No

A6b. ***In what country were you born?*** *(Country_____)*

And in what city? *(City_____)*

(These items are optional, site-specific)

A7. ***How old were you when you first came to live in the mainland United States?***

___ *years*

A8. ***In the last year, have you been back to _____ (insert country of birth)?***

1) Yes
2) No

A9. ***In general, what language do you read and speak?***

1) Spanish		*1) English only*
2) English	*or*	*2) English primarily*
3) Both		*3) Both equally*
4) Other language primarily		
5) Other language only		
6) Declined to answer		

A10. ***What language do you usually speak at home?***

1) Spanish		*1) English only*
2) English	*or*	*2) English primarily*
3) Both		*3) Both equally*
4) Other language primarily		
5) Other language only		
6) Declined to answer		

A11. ***In what language do you usually think?***

1) Spanish		*1) English only*
2) English	*or*	*2) English primarily*
3) Both		*3) Both equally*
4) Other language primarily		
5) Other language only		
6) Declined to answer		

A12. ***What language do you usually speak with your friends?***

1) Spanish		*1) English only*
2) English	*or*	*2) English primarily*
3) Both		*3) Both equally*
		4) Other language primarily
		5) Other language only
		6) Declined to answer

A13. ***Do you consider yourself to be:*** **(Interviewer: read options and check only one)**

1) Gay (Homosexual)
2) Bisexual
3) Straight (Heterosexual)
4) Undecided / Don't Know

A13. ***Do you consider yourself to be:*** (Interviewer: read options and check only one)

1) Gay (Homosexual)
2) *Bisexual*
3) Straight (Heterosexual)
4) Undecided / Don't Know
5) Other
6) Refused

B. Female Partners

Now I will be asking you some personal questions about sex. Remember your answers are confidential. We're not interested in the names of people.

B1. ***Thinking back over the past three months, have you had any kind of sexual contact with a woman? By sexual contact, we mean vaginal, oral, or anal sex, or any other physical contact leading to orgasm.***

1) Yes
2) No (Skip to Section C: Male Partners in Past Three Months)

B2. ***The last, most recent time you had any kind of sexual contact with her, did you have vaginal sex?***

1) Yes
2) No (Skip to question B3)

B2a. ***While you were having vaginal sex that time, did you use a condom from start to finish?*** **(If necessary:** ***either a male condom or a female condom.,)***

1) Yes
2) No

B3. ***The last, most recent time you had any kind of sexual contact with her, did you have anal sex?***

1) Yes
2) No (Skip to Section C: Male Partners in Past Three Months)

B3a. ***While you were having anal sex that time, did you use a condom from start to finish?***

1) Yes
2) No

C. Male Partners in Past Three Months

Next I'd like to ask you a few questions about any sex you've had with male partners in the past three months - that is, since "exact date three months ago", **or** ***about*** "familiar date or holiday three months ago." ***When I say "men", I mean male partners of any age.***

C1. ***In the past three months, how many men have you had any sexual contact with? By sexual contact, I mean oral or anal sex, or any other physical contact leading to orgasm.***

_____ # *men* (If C1 is zero, then verify: ***So you have not had any kind of sex with male partners in the past three months?*** and skip to section D: Sex with Main Male Partner)

Now I want to ask some questions about anal sex. When I say "anal sex", I mean penetrative anal intercourse.

(If C1 above is one, then skip to question C4)

(If C1 above is more than one, then proceed to question C2)

C2. (If more than one male partner) ***So of those*** (insert number from question C1) ***male partners you just mentioned, with how many different men have you had any anal sex in the past three months? No matter whether you were the inserting partner or the receptive partner, and no matter whether you used condoms or not.***

men (If C2 is zero, then verify: ***So you have not had anal sex with any of your male partners in the past three months?*** and skip to section D)

(If C2 is one, then skip to question C4)

(If C2 is more than one, then proceed to question C3)

C3. ***And of those*** (insert number from question C2) ***male partners for anal sex, with how many different men have you had any anal sex without a condom in the past three months?***

men

Now I want to change the topic from the number of partners to the **number of different times** ***you've had anal sex with and without condoms in the past three months.***

C4. ***In the past three months, how many times have you had anal sex with men (or this man), where you were the*** **inserting** ***partner, and you did use a condom?***

 # times

C5. ***In the past three months, how many times have you had anal sex with men (or this man), where you were the*** **inserting** ***partner, and you did not use a condom?***

 # times

C6. ***In the past three months, how many times have you had anal sex where you were the*** **receptive** ***partner, and your partner did use a condom?***

 # times

C7. ***In the past three months, how many times have you had anal sex where you were the*** **receptive** ***partner, and your partner did not use a condom?***

 # times

D. Sex with Main Male Partner

Now I want to ask you some questions about the last time you had sexual contact with a man who you consider to be your main male partner, like a lover or a boyfriend. Remember your answers are confidential.

D1. ***In the past year, have you had any kind of sexual contact with a man who you consider to be your main male partner?*** (repeat definition of sex (from page 4, C1))

1) Yes
2) No (Skip to Section E: Sex with Non-Main Male Partner)

02. ***About how long ago was the last time you had sexual contact with a main male partner?***

days / weeks / months ago / today (Circle one and write number in blank)

D3. ***The last, most recent time you had any kind of sexual contact with him, did you have anal sex where you were the inserting partner?***

1) Yes
2) No (Skip to question D4)

D3a. ***While you were having anal sex that time, did you use a condom from start to finish?***

1) Yes
2) No

D4. ***And the last, most recent time you had any kind of sexual contact with him, did you have anal sex where you were the receptive partner?***

1) Yes
2) No (Skip to question D5)

D4a. ***While you were having anal sex that time, did he use a condom from start to finish?***

1) Yes
2) No

D5. ***Were you high on drugs or alcohol the last time you had sex with him?***

1) Yes
2) No

D6. ***The last time you had sexual contact with him, did you have an idea what his HIV status might be?***

1) Yes, I did
2) No, I did not (Skip to Section E: Sex with Non-Main Male Partner)

D7. ***Could you tell me what you* thought *his status was at that time?***

1) I thought it was Positive
2) I thought it was Negative
3) Refused (Skip to Section E: Sex with Non-Main Male Partner)

D8. ***Why did you think that he was* (response from D7)7**

(Do not read options aloud. Instead, prompt for response and categorize.)

1) He told me explicitly
2) I guessed based on other things he has talked about
3) Someone else told me
4) By his appearance
5) We got tested together
6) I saw his results
7) I went with him to get his results
8) Other (Specify: _____)

D9. ***Have the two of you ever talked about using condoms or practicing safer sex?***

1) Yes
2) No

E. Sex with Non-Main Male Partner

Now I want to ask you some questions about the last time you had sexual contact with a man who you did not consider to be your main male partner. Remember your answers are confidential.

E1. ***In the past year, have you had any kind of sexual contact with a man who was not your main male partner?*** **(repeat definition of sex (from page 4, C1))**

1) Yes
2) No (Skip to Section F: Other Risk History)

E2. ***About how long ago was the last time you had sexual contact with a non-main male partner?***

days / weeks / months ago / today (Circle one and write number in blank)

E3. ***The last, most recent time you had any kind of sexual contact with him, did you have anal sex with you as the inserting partner?***

1) Yes
2) No (Skip to question E4)

E3a. ***While you were having anal sex that time, did you use a condom from start to finish?***

1) Yes
2) No

E4. ***And the last, most recent time you had any kind of sexual contact with him, did you have anal sex with you as the receptive partner?***

1) Yes
2) No (Skip to question E5)

E4a. ***While you were having anal sex that time, did he use a condom from start to finish?***

1) Yes
2) No

E5. ***And the last, most recent time you had any kind of sexual contact with him, did you communicate with him in any way about using a condom when you had sex that time?***

1) Yes
2) No

E6. ***Were you high on drugs or alcohol the last time you had sex with him?***

1) Yes
2) No

E7. ***The last time you had sexual contact with him, did you have an idea what his HIV status might be?***

1) Yes, I did
2) No, I did not (Skip to Section F: Other Risk History)

E8. ***Could you tell me what you* thought *his status was at that time?***

1) I thought it was Positive
2) I thought it was Negative
3) Refused (Skip to Section F: Other Risk History)

E9. ***Why did you think that he was*** (response from E8)7
(Do not read options aloud. Instead, prompt for response and categorize.)

1) He told me explicitly
2) I guessed based on other things he talked about
3) Someone else told me
4) By his appearance
5) We got tested together
6) I saw his results
7) I went with him to get his results
8) Other (Specify: _____)

F. Other Risk History

Now I have a couple of other questions to ask before I go on to a completely different topic.

F1. ***In the last year, has anyone given you money, drugs, or anything valuable (like food, or a place to stay) to have sex?***

1) Yes
2) No

F2. ***Have you injected non-prescription drugs in the last year?***

1) Yes
2) No

G. Peer Norms about Condoms

People have different attitudes toward condoms, and we'd like to get a sense about what the people you know think about condoms. How much do you agree or disagree with each of the following statements? (Show respondent response card)

G1. ***Most of my friends think you should always use condoms when having anal sex with a new partner.***

1) Agree Strongly
2) Agree Somewhat
3) Disagree Somewhat
4) Disagree Strongly
5) Don't know/No response

G2. ***Most of my friends are using condoms these days when they have anal sex.***

1) Agree Strongly
2) Agree Somewhat
3) Disagree Somewhat
4) Disagree Strongly
5) Don't know/No response

G3. ***Most of my friends think you should use condoms whenever you have anal sex, including with a primary sex partner.***

1) Agree Strongly
2) Agree Somewhat
3) Disagree Somewhat
4) Disagree Strongly
5) Don't know/No response

G4. ***Most of my friends use condoms when they have anal sex with a new partner.***

1) Agree Strongly
2) Agree Somewhat
3) Disagree Somewhat
4) Disagree Strongly
5) Don't know/No response

H. Social Support

We all look to others for friendship, to talk with, and to get other kinds of help at one time or another. In the last 3 months, how often has each of the following kinds of help been available to you, if you needed it? (Show respondent response card)

H1 ***Someone you can share concern about AIDS with.***

1) Never or none of the time
2) Rarely or little of the time
3) Sometimes
4) Most of the time
5) Always or all of the time

H2. ***Someone you could talk to about your sexual fantasies.***

1) Never or none of the time
2) Rarely or little of the time
3) Sometimes
4) Most of the time
5) Always or all of the time

H3. ***Someone you can talk to about safer sex.***

1) Never or none of the time
2) Rarely or little of the time
3) Sometimes
4) Most of the time
5) Always or all of the time

H4. ***Someone you could tell if you were having unsafe sex.***

1) Never or none of the time
2) Rarely or little of the time
3) Sometimes
4) Most of the time
5) Always or all of the time

I. Knowledge and Attitudes about Antiretrovirals

Okay, now I'd like to ask you a few questions on another topic.

11. ***Have you heard about using a combination of drugs to treat HIV/AIDS, referred to sometimes as 'combination drug cocktails'? (Sometimes they include drugs called protease inhibitors.)***
    1) *Yes*
    2) *No* (Skip to Section J: Exposure to interventions)
    3) *Not Sure*

Tell me how much you agree or disagree with the following statements:

12 ***Because of these drugs, HIV is a less serious threat than it used to be.***
    1) *Agree Strongly*
    2) *Agree Somewhat*
    3) *Disagree Somewhat*
    4) *Disagree Strongly*
    5) *Don't know/No response*

13 ***I practice safe sex less often now because new medical treatments for HIV/AIDS have come along.***
    1) *Agree Strongly*
    2) *Agree Somewhat*
    3) *Disagree Somewhat*
    4) *Disagree Strongly*
    5) *Don't know/No response*

J. Exposure to Interventions

I'd like to ask about the different kinds of AIDS prevention activities you may have encountered. When I say "AIDS prevention", I mean using condoms or avoiding unprotected sex.

(Insert local project's name in blanks)	*Yes /No*	*How Many*	*#From Project*
In the past six months, have you participated in any workshops about AIDS prevention? How many workshops? How many of these were hosted by?			
In the past six months, have you attended any social events or parties that included AIDS prevention activities? How many events? How many of these were hosted by?			
In the past six months, have any educators or outreach workers talked to you about AIDS prevention? How many times? How many times were these people from?			
In the past six months, have you seen any flyers or pamphlets about AIDS prevention? How many different flyers? How many of these flyers were from?			
(Show samples)			
In the past six months, have you seen any flyers or pamphlets with information on workshops or social events? How many different flyers? How many of these flyers were from?			
(Show samples)			
Have you seen or heard anything else about?			
(Example: radio, newspaper, TV)			

K. Wrap-up

I've got just a few more questions to ask. These won't take long at all and then we're done.

K1. ***We'd like to know whether people carry condoms with them. Are you carrying a condom now?***

1) Yes
2) No (Skip to question K2)

K1a. ***Would you show it to me?***

1) Condom seen, marked with CITY project logo [for use only after Intervention begins]
2) Condom seen, not from CITY project
3) Condom nearby in coat, car, etc.

K2. ***Have you been interviewed with this survey before?***

1) Yes
2) No (Skip to question K6)
3) DK / NS (Skip to question K6)

K3. ***How many times? # _____***

K4. ***When was that / the last time? That is, how long ago?***
(Record answer as given by respondent, then categorize as 1, 2, 3, 4, or 5 below.)
*Response:*_____

1) Less than 1 month ago
2) 1 to 2 months ago
3) 3 to 5 months ago
4) 6 months to a year ago
5) more than a year ago
6) DK / NS

K5. ***Where were you interviewed that last time?***

K6. ***In order to find other men like yourself to do this survey, we would like to know where you and your friends might hang out and how often you go there.*** (Hand respondent palm card with list of venues in that city.) ***Can you tell me the total number of times you have been to any of these places in the past two weeks?***

_____*times*

K7. ***Are there any other places not on this list that you or your friends would go to?***

Name of place	*Best days*	*Time of day*

K8. ***Can you name a place where you would feel <u>comfortable</u> going for an HIV test?***

1) Yes (Specify: _____)
2) No

K9. ***Have you ever been tested for HIV?***

1) Yes
2) No (Skip to question K12)
3) DK / NS (Skip to question K12)
4) Refused (Skip to question K12)

K10. ***About how long ago was the last time you were tested for HIV?***

___ *days / weeks / months / years ago* (Circle one and write number in blank)

K11. ***Would you be willing to tell us the result of the last test?***

1) Positive
2) Negative
3) Indeterminate (Verify: *So the doctor or clinic said the result was indeterminate?*
4) Did not go back to get results
5) Don't know (Prompt: *Did you go back to get the results?;*
6) Refused

K12. ***Now that the survey is completed, would you like to go back and make changes to any of your responses?***

1) Yes (record changes next to original response)
2) No

End time: _____: _____ *am / pm*
hour *minute* (circle one)

That was the last question. You've been very helpful. Thank you for your time and patience. Do you have any questions about what we've talked about that you would like to ask me?

Correct significant misconceptions about AIDS transmission/prevention and make referrals as appropriate

Interviewer comments:

Do you have any reason to question the truthfulness of the respondent's answers?
Yes (discuss this with your supervisor and fill out the appropriate form)
No

Do you think, for any reason, that the respondent is ineligible for the study?
Yes (discuss this with your supervisor and fill out the appropriate form)
No

APPENDIX B

The CITY data were entered and cleaned using state-of-the-art procedures for insuring data quality. First, all data were double entered at the sites on a custom-designed data entry template that was designed to minimize data entry errors. After site data entry staff had addressed any data discrepancies identified by double entry comparison, data were forwarded on a monthly basis to a professional data coordinating center, which ran analyses on data inconsistencies and illogical patterns in the data. Data inconsistencies were things such as discrepancies between a respondent's age and birth date. Illogical reporting were things such as stating one had no casual partners and then later reporting sexual acts with a casual partner. Once discrepancy and illogic reports were produced, these were returned to the sites who sought to correct problems that resulted from data input errors. Data for which problems could not be resolved were removed from the analytic sample if the nature of the discrepancy called into question the validity of the data or concerned study eligibility criteria.

APPENDIX C

Table 1

Cities and Racial Strata (N=8375)

Community	N
African American	
Atlanta	812
Birmingham	585
Chicago	542
Hispanic/Latino	
LA/Orange County	579
LA/San Gabriel Valley	560
NY/Jackson Heights/Corona	775
NY/Washington Heights/South Bronx	756
Asian/Pacific Islander	
San Diego	355
Seattle	348
Mixed Race	
Detroit	816
Milwaukee	816
Minneapolis	732
LA/West Hollywood	731

Table 2

Descriptive Statistics of Study Variables among HIV-negative and HIV-positive young MSM

Predictor Variables	HIV- negative		HIV-positive		Total		
	%	N	%	N	%	N	χ^2
Race							22.84**
Hispanic	34.2	2811	34.5	59	34.2	2870	
African American	27.8	2283	40.9	70	28.1	2353	
White	22.6	1858	10.5	18	22.4	1876	
Other	15.4	1261	14	24	15.3	1285	
Education							3.88
0-6 Years	.6	52	1.2	2	.6	54	
Some H.S	10.0	819	14.1	24	10.1	843	
H.S Grad	35.1	2874	35.3	60	35	2934	
Some College	40	3282	36.5	62	40	3344	
College Grad	14.3	1169	12.9	22	14.2	1191	
Employment							6.23**
Not Working	14.4	1185	21.6	37	14.6	1222	
Working	85.6	7020	78.4	134	85.4	7154	
Sexual Orientation							5.81
Gay	74.1	6074	80.1	137	74.2	6211	
Bisexual	20	1643	14	24	19.9	1667	
Straight	.5	38	-	0	.5	38	
Other	5.4	441	5.8	10	5.4	451	
	Mean	SD	Mean	SD	Mean	SD	t-test
Age	21.52	2.26	22.18	2.4	21.53	2.26	-3.78**

*p<.05, **p.<.01

Table 3

High Risk Sexual Behaviors of HIV-negative young MSM versus those who are HIV - positive

Predictor Variables	HIV- negative		HIV-positive		
	%	N	%	N	χ^2
Within Past Year					
Traded Sex (N=8375)					3.66†
Yes	10.4	854	15.2	26	
No	89.6	7950	84.8	145	
Past 3 Months					
UAI with Men (N=7538)					6.23
Yes	34	2481	39.6	61	
No	66.4	4903	60.4	93	
UAI or UVI with women (1003)					***
Yes	18.2	181	27.3	3	
No	81.8	811	72.7	8	
Last Encounter					
UAI with main partners (N=6152)					.03
Yes	25	1508	24.4	30	
No	75	4521	75.6	93	
UAI with non-main partners (N=5969)					2.58
Yes	9.6	559	14.1	18	
No	90.4	5282	85.9	110	
Sex while high w/ main partners (N=6167)					3.46†
Yes	17.6	1066	24.4	30	
No	82.4	4978	75.6	93	
Sex while high w/ non-main partners (N=5990)					1.98
Yes	27.6	1619	33.3	43	
No	72.4	4246	66.7	86	
Knowledge of main partner's HIV status (N=6176)					.02
Yes	84.2	5098	83.7	103	
No	15.8	955	16.3	20	

Knowledge of non-main partner's HIV status (N=5984)					1.50
Yes	41	2399	35.7	46	
No	59	3456	64.3	83	
Talk about safer sex with main partner (N=5797)					.11
Yes	84.9	4828	84.1	95	
No	15	855	15.9	18	
Talk about safer sex with non-main partner (N=5980)					.05
Yes	60.2	3526	61.2	79	
No	39.8	2329	38.8	50	
	Mean	SD	Mean	SD	t-test
Number of male partners without a condom in past 3 months (N=8295)	.36	.61	.49	.72	-2.24*

Table 4

Bivariate Correlations Matrix for Main Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	-												
2. Black	-.03**	-											
3. Latino	.06**	-.45**	-										
4. White	-.02*	-.34**	-.39**	-									
5. Other Race	.01	-.05**	-.06**	-.04**	-								
6. Education	.34**	.07**	-.24**	.101**	.01	-							
7. Employment	.18**	-.03**	.02	.04**	.004	.12**	-						
8. HIV Status	.04	.04**	.001	-.04**	.04**	-.02	-.03**	-					
9. Peer Norms	.01	.07**	.04**	-.11**	-.04**	-.001	.004	-.02	-				
10. Social Support	-.02	.04**	-.07**	.06**	.009	.07**	-.007	-.01	.12**	-			
11. Prevention	-.04**	.000	-.03*	.01	.02	.02*	-.009	.001	-.004	.04**	-		
12. Any UAI	.02	-.09**	-.04**	.08**	.02	.02	-.02	.02	-.18**	-.03*	-.003	-	
13. Traded Sex	-.005	-.09**	.106**	-.06**	.001	-.08**	-.05**	.02*	-.06**	-.05**	-.003	.006	-
14. Substance Use	.07**	-.01	.03*	.07**	-.001	-.01	-.008	.02	-.07**	-.04**	-.02*	.05**	.16**

Note. N=8295.
*p<.05, **p<.01

Table 5

Sequential Logistic Regression Analysis Predicting Unprotected Anal Intercourse[†] among HIV-positive young MSM (N=148)

	Step 1					Step 2				
				95% CI					95% CI	
Variables	*B*	Wald	Odds Ratio	*Lower*	*Upper*	*B*	Wald	Odds Ratio	*Lower*	*Upper*
Age	.01	.03	1.01	.87	1.18	.06	.53	1.06	.90	1.26
Latino	.46	.70	1.59	.54	4.66	.62	1.04	1.85	.57	6.06
Black	.15	.08	1.16	.41	3.25	.23	.16	1.26	4.12	3.85
White	-.07	.01	.93	.24	3.61	-.16	.05	.86	.20	3.61
Education	-.25	1.42	.78	.51	1.18	-.26	1.25	.77	.49	1.22
Employment	.34	.61	1.41	.60	3.32	.54	1.28	1.72	.67	4.37
Peer Norms						.12	4.26*	1.13	1.0	1.27
Social Support						.15	8.93**	1.17	1.06	1.29
Exposure to Prevention						-.06	.05	.94	.55	1.61
Trading Sex						-.16	.08	.86	.31	2.41
Substance Use						-.40	1.08	.67	.32	1.42
Model Chi Square (df)	3.95					22.21**				
-2 Log Likelihood	194.25					175.99				
Nagelkerke R Square	.04					.19				

*p<.05, **p<.01

[†] For the purpose of interpretability, the dependent variable, any UAI, was coded 0 = yes, 1=no.

Table 6

Sequential Logistic Regression Analysis Predicting Unprotected Anal Intercourse[†] among HIV-negative young MSM (N=7279)

	Step 1					Step 2				
				95% CI					95% CI	
Variables	*B*	Wald	Odds Ratio	*Lower*	*Upper*	*B*	Wald	Odds Ratio	*Lower*	*Upper*
Age	-.02	3.34	1.02	.95	1.10	-.02	2.83	.98	1.0	1.05
Latino	.50	41.61**	.62	1.41	1.91	.48	38.13**	1.62	.53	.72
Black	.71	81.03**	.51	1.74	2.37	.68	72.34**	1.98	.43	.59
White	.06	.67	.86	.92	1.24	.15	3.37	1.16	.74	1.01
Education	.004	.02	1.01	.94	1.07	-.009	.08	.99	.95	1.08
Employment	.14	3.82*	.88	1.0	1.31	.13	3.13	1.14	.76	1.01
Peer Norms						.12	197.44**	1.12	.786	.786
Social Support						.002	.09	.77	.775	.775
Exposure to Prevention						.01	.09	.76	.622	.622
Trading Sex						-.01	.01	.91	.415	.415
Substance Use						-.10	3.25	.07	.705	.705
Model Chi Square (df)	134.53 (6)**					347.367 (5) **				
-2 Log Likelihood	9158.87					8946.03				
Nagelkerke R Square	.03					.07				

*p<.05, **p<.01

[†] For the purpose of interpretability, the dependent variable, any UAI, was coded 0 = yes, 1=no.

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FOOTNOTES

[1] Some variation from the seasonal timeframe occurred in Detroit due to administrative problems.

[2] It was originally thought that city must be controlled because HIV seroprevalence varies greatly by the communities included in the sample. However, city was not included because, due to the fact that that the cities were stratified by race, there was a strong correlation between the city and race variables. Thus, including this variable would have provided redundant information and may have introduced problems with multi-collenearity. In addition, it was not possible to include this variable because there were not enough HIV-positive men in some cities to achieve the sufficient cell frequency needed for statistical analyses. Finally, separate analyses revealed that community did not significantly predict HIV-status after race was entered into a logistic regression model.

[3] The main analyses were also performed without the men reporting an "indeterminate" HIV-status. No significant differences in our findings were detected as a result of this analysis.