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Outcomes from a Homegrown HIV Prevention Program for Extremely High-risk, Substance-using Men who have Sex with Men with Multiple Health Disparities

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Abstract

From February 2010 through December 2014, 585 substance-using MSM were enrolled into a “homegrown” risk reduction intervention. Participants evidenced significant iterative factor reductions in the odds of substance use including alcohol (AOR=0.79) and marijuana (AOR=0.78; both $p < 0.05$) and marginally significant reductions in the odds of methamphetamine use (AOR=0.83; $p = 0.07$). Participants also evidenced significant reductions in sexual risks including the odds of reporting drug/alcohol use before or during sex (AOR=0.80) and of condomless anal intercourse (AOR=0.72; all significant at $p < 0.05$). Results demonstrate that the homegrown intervention was effective at reducing HIV risk behaviors among high-risk MSM.

Keywords

men who have sex with men (MSM); methamphetamine; HIV/AIDS; substance use

Introduction

Social Determinants of Health among Men Who Have Sex with Men

Gay, bisexual, and other men who have sex with men (MSM) in the United States (US) are at increased risk for HIV acquisition and transmission relative to their non-MSM male counterparts (CDC, 2015). Though MSM comprise no more than an estimated 8.6% of the total US population (Purcell et al., 2012), the majority of newly diagnosed HIV cases in the US each year occur among MSM (CDC, 2014a), with particularly high rates of incidence observed among urban and/or racial minority MSM (CDC, 2014b; CDC, 2015). The inflated rates of HIV prevalence among samples of MSM in the US have largely been attributed to elevated engagement in condomless anal intercourse (CAI; CDC, 2015). Importantly, several social determinants of health (e.g., obstacles to educational attainment, homelessness, incarceration; Hodel, Levi, & Biasi, 2014; Kipke, Weiss, & Wong, 2007) as well as substance use (Carey et al., 2009; Celentano et al., 2006; Colfax et al., 2005; Halkitis et al.,

2011; Ostrow et al., 2009) have been identified as primary factors contributing to the high rates of CAI among MSM, and thus increasing the risk of HIV acquisition or transmission.

Several related and often reinforcing social determinants of health (i.e., environmental factors influencing personal health outcomes) have been shown to increase risk of infection with HIV among MSM (Sharpe Harrison, & Deane, 2010; Logie, 2012), including homelessness or unstable housing (Gangamma, Slesnick, Toviss, & Serovich, 2008), reduced educational attainment (Ostrow et al., 2009), and/or incarceration (Javanbakht et al., 2009). Further, evidence consistently reveals that non-white (predominantly African American/black and Hispanic/Latino) MSM are more likely to report obstacles to educational attainment, residential insecurity, and negative interactions with the criminal justice system relative to their white MSM counterparts (Millett et al., 2012) and, due to these social determinants of health, are at increased risk for HIV (Millett, Flores, Peterson, & Bakeman, 2007).

Reduced Educational Attainment, Condomless Anal Intercourse and HIV

Among MSM, reduced educational attainment is associated with increased engagement in CAI, increased methamphetamine/alcohol/polydrug use, increased likelihood of reporting a HIV-positive serostatus, and increased likelihood of unrecognized/untreated infection with HIV (Greenwood et al., 2001; Finlayson et al., 2011; Halkitis et al., 2009; Hampton et al., 2013; Ostrow et al., 2009; Raymond, Bingham, & McFarland, 2008). African American/black MSM are more likely to have reduced educational attainment, lower income, and to be unemployed relative to their white MSM counterparts (Millett, Flores, Peterson, & Bakeman, 2007; Hodel, Levi, & Biasi, 2014). In addition to the deleterious health risks and increased exposure to HIV risk associated with reduced educational attainment, fewer years of schooling is also associated with increased risk for residential insecurity (i.e., homelessness; unstable or temporary housing), which is in turn associated with increased engagement in HIV sexual risk behavior among MSM (Tucker et al., 2012).

Residential Insecurity and Increased HIV Risk Behaviors

MSM are more likely to experience homelessness or unstable housing relative to their heterosexual counterparts (Hodel, Levi, & Biasi, 2014), and residential insecurity has been associated with increased engagement in CAI among MSM (Gorbach, Murphy, Weiss, Hucks-Ortiz, & Shoptaw, 2009). Any experience of homelessness among MSM is strongly associated with increased exposure to drug use and HIV sexual risk behaviors (including sex work; Clatts, Goldsamt, Yi, & Gawdz, 2005; Kipke, Weiss, & Wong, 2007). In part, as a result of such increased engagement in illicit substance use and engagement in sex work, the experience of residential insecurity places MSM at increased risk for both arrest and incarceration (Clatts, Goldsamt, Yi, & Gwadz, 2005).

Incarceration and Increased HIV Prevalence Rates

Incarcerated MSM demonstrate a HIV prevalence rate of over six times greater than their non-MSM male counterparts (Chen, Bovée, & Kerndt, 2003). Compared to non-MSM male inmates, MSM inmates (particularly racial minority MSM inmates) are at elevated risk for infection with HIV and/or other STIs while incarcerated; large-sample longitudinal

monitoring of MSM inmates in Los Angeles County (LAC) suggest elevated rates of STI/HIV prevalence and incidence relative to non-MSM inmate populations, with particularly high morbidity observed among non-Hispanic, non-white MSM (Javanbakht et al., 2009). Additionally, meta-analytic data reveal that African American/black MSM are more likely than other MSM to be incarcerated (Millett, Flores, Peterson, & Bakeman, 2007; Millett et al., 2012), further increasing their relative risk for HIV infection through the criminal justice system. Incarceration has also been shown to be associated with increased substance use among racial minority status MSM (Brewer et al., 2014).

Substance Use, Sexual Risk Behaviors and HIV

Evidence further demonstrates that MSM who use alcohol (Parsons, Kutnick, Halkitis, Punzalan, & Carbonari, 2005; Koblin et al., 2006; Vosburgh, Mansergh, Sullivan, & Purcell, 2012), powder/crack cocaine (Carey et al., 2009; Colfax et al., 2005; Hirshfield, Remien, Humberstone, Walavalkar, & Chiasson, 2004; Schwarcz et al., 2007), amyl nitrite (i.e., inhalants/poppers; Buchbinder et al., 2005; Colfax et al., 2005; Drumright, Patterson, & Strathdee, 2006; Hatfield, Horvath, Jacoby, & Simon Rosser, 2009; Ostrow et al., 2009; Schwarcz et al., 2007), and/or methamphetamine (Carey et al., 2009; Drumright et al., 2006; Halkitis, Levy, Moreira, & Ferrusi, 2014; Hoenigl et al., 2015; Semple, Zians, Strathdee, & Patterson, 2009; Shoptaw & Reback, 2007; Vosburgh, Mansergh, Sullivan, & Purcell, 2012) are more likely to engage in HIV sexual risk behaviors and be at increased risk for HIV acquisition or transmission than MSM not using these substances. Stimulant use, and particularly methamphetamine use, has been highlighted by the Centers for Disease Control and Prevention as a driving force behind the HIV epidemic among MSM (CDC, 2007), with methamphetamine use being most prevalent among MSM in the western US (Reback, Fletcher, Shoptaw, & Grella 2013).

Targeting Multiple Health Disparities among Extremely High-risk, Substance-using MSM

Reduced educational attainment, homelessness or marginal housing, incarceration, and/or substance use not only increase vulnerability and exposure to HIV among MSM, but they also reduce availability and accessibility to more traditional interventions that are not designed to work with MSM who suffer from multiple related and reinforcing health disparities. Interventions targeting such highly impacted populations should be based on a philosophy of harm reduction, have the ability to meet participants “where they are at,” address their urgent and pressing needs, and then work with participants to reduce their HIV sexual risk behaviors and substance use. This study reports the observed effects of a community-based, homegrown,¹ low-intensity, health education/risk-reduction HIV prevention program, *Guys Understanding Your Situation (G.U.Y.S.)*, designed to reduce HIV sexual risk behaviors and substance use among extremely high-risk, substance-using MSM.

¹Homegrown refers to interventions that are locally developed or adapted and are targeted to specific populations and/or groups.

Method

Participants

Participants were gay, bisexual or other MSM (N=585) who attended between one and four sessions of the community-based, homegrown, low-intensity, health education/risk reduction HIV prevention program (*G.U.Y.S.*) serving extremely high-risk, substance-using MSM in the Hollywood/West Hollywood area of LAC. Eligibility criteria for the *G.U.Y.S.* program was 1) male and self-reported sex with another male in the previous 12 months, and 2) self-reported use of any substance use in the previous 12 months.

Procedures

Data were collected from January 4, 2010 through December 30, 2014. Potential participants were recruited to the *G.U.Y.S.* program by teams of outreach workers who canvassed areas known to be frequented by members of the targeted populations including sex clubs, bars, bathhouses, cruising areas, parks, coffee houses, inexpensive hotels and specific street corners and alleys. Any eligible individual who attended at least one individual risk reduction counseling session or one 60-minute group session was considered a program participant. Participants could attend an unlimited number of group sessions; however, assessments were only conducted during the first and third groups and at 30 day follow-up. Participants could attend a maximum of three individual risk reduction sessions; if additional services were required, participants were then referred to a more intensive program onsite. Assessments were conducted during the three individual risk reduction counseling sessions and at the follow-up time points at 30, 60 and 90 days. The individual risk reduction counseling sessions and group session could be attended in any order.

Participants could earn \$50.00 in gift cards as an incentive for program participation (\$5.00 gift cards distributed at the first, second and third individual risk reduction counseling session, at the 30-, 60-, and 90-day individual sessions follow-up assessments, at the first, second and third group sessions, and at the 30-day group follow-up assessment). All program materials were approved by the funding agency. Program procedures and intervention designs have been reported elsewhere (Bowers, Branson, Fletcher, & Reback, 2011). Figure 1

Intervention

The *G.U.Y.S.* program was designed in 1995 (by the first author) as a “homegrown” intervention to meet the needs of a very specific disenfranchised and vulnerable high-risk population of MSM in the urban core of the Hollywood/West Hollywood area in LAC. Homegrown interventions are locally developed or adapted, are typically health education or risk reduction interventions, and are targeted to specific populations and groups (UCHAPS, 2011).

The *G.U.Y.S.* program consists of culturally appropriate individual risk reduction and group sessions designed to reduce HIV sexual risk behaviors and substance use. The interventions were conducted in teams of two ethnically diverse, indigenous, paraprofessionals. All staff received 6-to-8 weeks of intensive training (from the first author) and demonstrated

proficiency in group facilitation, establishing trust and rapport among high-risk participants, administering brief assessments, culturally appropriate referrals, and protecting human research subjects. Groups were conducted daily at 3:00 PM and a full meal was served prior to each group. Art Exploration Groups were conducted on Mondays and Wednesdays. The Art Exploration Groups provided a context for creative expression and an art medium for participants to identify their feelings and triggers, and work towards understanding their high-risk behaviors. The Art Exploration Group offered a space whereby participants cultivated their voices and expressed their life experiences through art. Skills-building Groups were facilitated on Tuesday, and Thursdays. The Skills-building Group topics included: Emotions, Depression and Substance Use; Entering the Work Force or Continuing Your Education; Finding Solutions; Hepatitis and Sexually Transmitted Infections: Viral vs. Bacterial; Self-esteem and Homophobia; Sex and Drugs; Sexual Risks. Open Discussion Groups were facilitated on Fridays. Participants were provided a safe environment, within a high-tolerance milieu, to openly discuss high-risk behaviors. A central focus of all program components was the link between HIV sexual behaviors, substance use, and the participants' experience of living publically, on the streets. HIV risk co-factors and health disparities such as homophobia, stigma, racism and discrimination were addressed in each group format. Condoms and other risk reduction supplies were available at the site and referrals were made to needed services.

Measures

Behavioral Risk Assessment (BRA)—The BRA is a brief, 13-page HIV risk assessment, designed by the first author (Reback, 2005), that records data on participants' sociodemographic characteristics (e.g., gender identity, sexual identity, age, race/ethnicity, HIV status, educational attainment, housing status, insurance coverage), substance use in the previous 30 days (injection and non-injection drug use and safe needle use protocol), number and gender of sexual partners in the previous 30 days (main, casual, anonymous, exchange, and male, female, male-to-female preoperative transgender, female-to-male preoperative transgender), and details about the participants' three most recent sexual encounters within the previous 12 months (partner type, number or partners in the encounter, HIV status of partner(s), sexual activities during the encounter, substance use by participant and partner(s), location of sexual encounter).

Each participant was included in the data up to four times, chronologically, once for each assessment carried out during administration of the *G.U.Y.S.* program (i.e., at the first and third group intervention, and at the first and third individual intervention). Using a unique identifier to ensure anonymity, staff recorded participant responses on a paper behavioral risk assessment instrument that was subsequently scanned into an optical mark reader for translation into an electronic database. Given that *G.U.Y.S.* is not a closed intervention with a specific mandatory assessment schedule, the duration of time between each assessment varied by participant. All data were self-reported.

Statistical Analysis

Descriptive statistics for participant sociodemographics and participant substance use/sexual risk behaviors are provided in Table I and Table II, respectively. Serodiscordant sex was

defined as sex with someone of unknown or different status and included oral and/or anal and/or vaginal sex. Condomless anal intercourse included both receptive and insertive anal intercourse. Logistic cross-sectional time-series analyses were carried out to regress participants' self-reported substance use in the previous 30 days as well as participants' self-reported risk behaviors during their most recent sexual encounter on program assessment time points (up to four assessments, coded 1, 2, 3, 4), while controlling for the sociodemographic characteristics displayed in Table I. Resulting coefficients were exponentiated and displayed as adjusted odds ratios (AOR) representing the estimated factor change in the odds of a given behavior at each program assessment time point (mean number of assessments completed = 2.3). Data was analyzed under an "intent to treat" model, and participant data was included regardless of their level of intervention exposure; missing data was not imputed. Statistical outcomes were considered significant beginning at $\alpha = 0.05$, though results achieving $p = 0.07$ were considered to be trending towards significance and also discussed. All significance tests were two-tailed, and all analyses were carried out using Stata v13SE.

Results

One-third (32.3%) of the participants self-identified as Caucasian/white, one-quarter (25.5%) as African American/black (25.5%), and 22.6% as Hispanic/Latino. Nearly all identified as either gay (61.6%) or bisexual (38.0%). The average age was 37.6 years (standard deviation [SD] = 10.2). Almost two-thirds (65.8%) self-reported a high school diploma or GED as their highest educational attainment and a significant minority reported having less than a high school education (17.4%). Approximately half (51.7%) of the participants reported current homelessness and nearly a third (31.9%) had been incarcerated within the previous 12 months. A HIV-positive serostatus was reported by 20.1% of the participants.

At baseline, the most frequently used substances in the previous 30 days were marijuana (55.9% use prevalence), followed by methamphetamine (44.4%), alcohol (5 or more drinks at one time; 32.5%), crack cocaine (10.9%), amyl nitrite (9.9%), and powder cocaine (9.4%). At baseline, most participants reported being under the influence of drugs and/or alcohol during their most recent sexual encounter (59.7%), and most also reported the presence of at least one HIV serodiscordant partner during their most recent sexual encounter (53.3%). Approximately one-third (34.7%) of the participants reported condomless anal intercourse during their most recent sexual encounter and, among those, half reported that the condomless anal intercourse encounter occurred with a HIV serodiscordant partner (17.3%).

Program participants demonstrated significant reductions in their use of alcohol (AOR = 0.79), amyl nitrite (AOR = 0.73), crack cocaine (AOR = 0.72), and marijuana (AOR = 0.78) use in the previous 30 days over the course of their program participation, with an iterative reduction of between 21%–28% in the odds of occurrence at each of the four assessment periods completed. Marginally significant odds reductions were also observed in the use of cocaine (AOR = 0.73; $p = 0.062$) and methamphetamine (AOR = 0.83; $p = 0.061$) use in the previous 30 days. In addition, participants evidenced significant reductions in HIV sexual

risk behaviors during their most recent sexual encounter, including engaging in sex while under the influence of drugs/alcohol (AOR = 0.80), engagement in sexual behavior with a HIV serodiscordant sexual partner (AOR = 0.81), engagement in condomless anal intercourse (AOR = 0.72), and engagement in condomless anal intercourse with a HIV serodiscordant sexual partner (AOR = 0.79).

Discussion

Participants of the *G.U.Y.S.* program comprised a group of racial/ethnically diverse (67.7% were MSM of color), extremely high-risk, substance-using MSM. Most of the participants reported their educational attainment as a high school diploma or GED, most were currently experiencing homelessness, almost one-third reported having been incarcerated at least once within the previous 12 months, and most reported engaging in a HIV sexual risk behavior with HIV serodiscordant sexual partners while under the influence of drugs/alcohol. Furthermore, one-fifth of the participants self-reported a HIV-positive serostatus, a higher HIV prevalence rate than has been observed among substance-using and non-substance using samples of MSM in LAC (15%; LAC DHSP, 2014), and commensurate with national samples of MSM acquired through similar venue-based outreach methodologies (19%; CDC, 2010). These findings highlight the portrait of participants who attended the *G.U.Y.S.* program as heavily impacted MSM who suffered multiple health disparities; and, those who are particularly high-value targets for HIV prevention and transmission harm reduction programming. Interventions based on the philosophy of harm reduction is particularly well suited for extremely high-risk individuals as this approach focuses on programming that aims to reduce risk without the requirement of absolute abstinence or recovery.

Over the course of the program, participants of the *G.U.Y.S.* program evidenced significant reductions in substance use and HIV sexual risk behaviors, with average iterative decreases of between 20%–30% in the odds of risk behavior engagement at each program assessment completed. This pattern and magnitude of results corresponds closely with prior meta-analytic averages of individual- and group-based HIV risk reduction interventions for MSM (Herbst et al., 2007). Furthermore, the wide array of reported reductions in both substance use and HIV sexual risk behaviors during the course of their program participation highlights the broad efficacy of the *G.U.Y.S.* program among urban disenfranchised, vulnerable, hard-to-reach, substance-using MSM, a population for which effective interventions are sorely lacking.

Though observed reductions in substance use were encouraging overall, estimated coefficients for cocaine and methamphetamine reductions failed to reach full significance (both $p < 0.07$), indicating perhaps supplementing a higher-intensity intervention may be appropriate for MSM reporting difficulty achieving reductions from cocaine or methamphetamine. Reducing the use of these drugs is of special importance to programs serving disenfranchised populations of extremely high-risk MSM, given each substance's particularly well-corroborated association with HIV sexual risk behaviors (Colfax et al., 2005; Koblin et al., 2006; Vosburgh, Mansergh, Sullivan, & Purcell, 2012; Vu, Maher, & Zoblatska, 2015). Contingency management interventions providing incentives for biomarker-confirmed substance abstinence have demonstrated efficacy among

methamphetamine- and cocaine-using samples in general (Lee & Rawson, 2008; Vocci & Montoya, 2009; Schierenberg, van Amsterdam, van den Brink, & Goudriaan, 2012; Farronato, Dürsteler-MacFarland, Wiesbeck, & Petitjean, 2013), as well as among heavily impacted stimulant-using MSM (Reback et al., 2010; Landovitz et al., 2012; Fletcher & Reback, 2013; Landovitz, Fletcher, Shoptaw, & Reback, 2015), and may warrant exploration as a mechanism of additional support for methamphetamine- and cocaine-using MSM engaged in low-intensity health education/risk reduction HIV prevention services.

In addition to reducing overall substance use, reduced engagement in substance use (especially stimulant use) before or during sexual intercourse is a crucial behavioral endpoint for high-risk MSM, as systematic review indicates that substance use during sex is consistently associated with HIV risk-taking among gay, bisexual, and other MSM (Beyrer et al., 2012; Vu, Maher, & Zablotska, 2015). When reporting on their most recent sexual encounter at any one of the three assessments post baseline (i.e., assessments coded 2, 3, or 4), participants of the *G.U.Y.S.* program were not only less likely to report sex while on drugs/alcohol, but were also less likely to report sexual activity with a HIV serodiscordant sexual partner, engagement in condomless anal intercourse, and engagement in condomless anal intercourse with a HIV serodiscordant sexual partner. Fewer condomless and/or serodiscordant sexual encounters in a community are expected to reduce transmission rates of HIV and other STIs among not just high-risk MSM directly receiving services, but also among other members of the community with whom such high-risk MSM have sex or inject drugs. The effectiveness of the *G.U.Y.S.* program in reducing such a wide range of the HIV sexual risk behaviors highlights its special suitability for application among extremely high-risk, substance-using MSM. Furthermore, it is crucial to note that such reductions in HIV risk behavior were achieved even in the face of several deleterious social determinants of health (i.e., reduced educational attainment, homelessness, incarceration) affecting the majority of the sample. Multivariate-adjusted longitudinal analyses demonstrated that neither these social determinants of health nor other sociodemographic factors (e.g., race/ethnicity, sexual identity, age) were predictive of program outcomes, implying that the homegrown *G.U.Y.S.* intervention produced positive outcomes among a broad range of MSM facing even some of the most challenging obstacles to reducing risk and improving their health.

Limitations and Conclusions

This study is limited by its use of observational data from a non-random study design lacking a control group. Study participants self-enrolled in the program, implying that self-selection biases could account for some portion of the observed reductions in participant risk behavior over time. Furthermore, the study was limited by the sociodemographic characteristics of the sample, which described an extremely high-risk group of substance-using MSM; these findings might have limited transferability to other populations. Additionally, all data was self-reported data and, thus, can reflect errors in recall, deliberate falsification, intoxication during the interview process, and/or social desirability (Jaccard et al., 2004). The use of iterative hypothesis testing across related outcomes in Table II increases the risk for a Type-I error, though this concern is mitigated by a theoretically consistent pattern of results exhibiting both magnitude and direction corroborating prior

meta-analytic reports on similar intervention populations (e.g., Herbst et al., 2007). The analyses in this study may also be limited by the non-trivial amount of missing data (i.e., the average participant attended only 2.3 of the 4 possible assessments), though replication of the program in other contexts is likely to be accompanied by similar rates of missing data.

Despite these limitations, results suggest the harm reduction approach of *G.U.Y.S.* program was effective for reducing substance use and HIV sexual risk behaviors among urban, disenfranchised, vulnerable, substance-using MSM. Effective harm reduction interventions targeting extremely high-risk MSM have been shown to be cost negative (Herbst et al., 2007), indicating that interventions like the *G.U.Y.S.* program may present opportunities for local policy-makers to protect the public health by simultaneously inhibiting the transmission of HIV and reducing health care expenditures in their community. Reduced HIV risk-taking among communities of heavily impacted, urban MSM serves not only to reduce downstream healthcare costs from reduced HIV/STI incidence among MSM, but also may prevent HIV and STI transmission to non-MSM members of the community within their sexual and drug-using networks. Furthermore, the homegrown nature of the *G.U.Y.S.* program, and the non-stop provision of its services to extremely high-risk, substance-using MSM in LAC for 20 consecutive years, indicates the high level of acceptability and feasibility for the program among this high-priority population.

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Figure 1. Conceptual framework of the GUYS program from the behavioral mechanism on the far left, program design in the middle, and behavioral change outcomes on the far right.

Table I:**Participant Sociodemographics (N = 585)**

Characteristic	n (%) or Mean [SD]
Racial/Ethnic Identity	
African American/black	149 (25.5%)
Asian/Pacific Islander	13 (2.2%)
Caucasian/white	189 (32.3%)
Hispanic/Latino	132 (22.6%)
Multi-racial/other	102 (17.5%)
Sexual Identity ^a	
Gay	360 (61.6%)
Bisexual	222 (38.0%)
Heterosexual	2 (0.3%)
Age	<i>years</i> 37.6 [10.2]
HIV-Status ^b	
HIV-positive	117 (20.1%)
HIV-negative	457 (78.5%)
Don't know	8 (1.4%)
Educational Attainment ^c	
Less than High School	101 (17.4%)
High School Graduate/GED	383 (65.8%)
College/Technical School Graduate	98 (16.8%)
Current Living Situation ^d	
Homeless	300 (51.7%)
Incarceration (Previous 12 Months) ^e	
Yes	184 (31.9%)

^a
n = 584^b
Self-reported; n = 582^c
n = 582^d
n = 580^e
n = 57

Table II:

Logistic Time-Series Regression Analyses of Participant Substance Use in the Previous 30 Days and Risk Behavior During Most Recent Sexual Encounter on Program Attendance; (N = 585)^a

		n (%; odds)	AOR [95% CI] ^b
<u>Substance Use-- Previous 30 Days</u>			
Alcohol (5 or more drinks at once)	Rate at Baseline	190 (32.5%; 0.48)	
	Factor Change in Odds at Each Assessment ^c	0.78 [0.63–0.96]	*
Amyl Nitrite	Rate at Baseline	58 (9.9%; 0.11)	
	Factor Change in Odds at Each Assessment ^c	0.71 [0.51–0.98]	*
Powder Cocaine	Rate at Baseline	55 (9.4%; 0.10)	
	Factor Change in Odds at Each Assessment ^c	0.74 [0.53–1.03]	
Crack Cocaine	Rate at Baseline	64 (10.9%; 0.12)	
	Factor Change in Odds at Each Assessment ^c	0.71 [0.53–0.95]	*
Marijuana	Rate at Baseline	327 (55.9%; 1.27)	
	Factor Change in Odds at Each Assessment ^c	0.80 [0.63–1.00]	*
Methamphetamine	Rate at Baseline	260 (44.4%; 0.80)	
	Factor Change in Odds at Each Assessment ^c	0.86 [0.68–1.01]	
<u>Risk Behavior During Most Recent Sexual Encounter</u>			
Sex on Drugs and/or Alcohol	Rate at Baseline	349 (59.7%; 1.48)	
	Factor Change in Odds at Each Assessment ^c	0.79 [0.67–0.92]	**
HIV Serodiscordant ^d Partner(s)	Rate at Baseline	312 (53.3%; 1.14)	
	Factor Change in Odds at Each Assessment ^c	0.78 [0.66–0.93]	**
Condomless Anal Intercourse (CAI)	Rate at Baseline	203 (34.7%; 0.53)	
	Factor Change in Odds at Each Assessment ^c	0.70 [0.59–0.83]	***
HIV Serodiscordant ^d CAI	Rate at Baseline	101 (17.3%; 0.21)	
	Factor Change in Odds at Each Assessment ^c	0.76 [0.62–0.93]	**

^a All models except the model for powder cocaine demonstrate a goodness of fit (i.e., Wald χ^2 df = 8) significant at $p < 0.01$ (Powder Cocaine model is non-significant).

^b AOR = Adjusted Odds Ratio (sociodemographic controls: racial/ethnic identity, sexual identity, age, HIV-status, educational attainment, homelessness, incarceration in the previous 12 months); 95% CI = 95% Confidence Interval;

*	p	0.05;
**	p	0.01;
***	p	0.001.

^c Maximum of four program assessments per participant (mean = 2.3).

^d Serodiscordant partner(s) were defined as sexual partners whose HIV serostatus was different than the participants', or was unknown to the participant.