Risk Behaviors Among HIV-Positive Gay and Bisexual Men at Party-Oriented Vacations

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ABSTRACT. Objective: This study examined substance use (intended and actual), unprotected sex, and HIV disclosure practices (disclosure and questioning) among HIV-positive men who have sex with men (MSM) at two party-oriented vacations, where substance use and sexual risk may be heightened. **Method:** A random sample of 489 MSM attending one of two party-oriented vacations participated in PartyIntents, a short-term longitudinal survey. Nearly half (47%) completed a follow-up assessment at the event or online for up to 2 weeks after the event. We examined rates of baseline intentions to use substances, actual substance use, and unprotected intercourse among HIV-positive men in attendance. Rates among HIV-negative men were estimated for comparison. Multiple logistic regression was used to assess the impact of illegal drug use and HIV status on unprotected anal intercourse (UAI). **Results:** HIV-positive attendees (17%) were significantly more likely than HIV-negative attendees to use nitrite inhalants (or "poppers") (24.3% vs. 10.7%). HIV-positive attendees were also significantly more likely to have insertive UAI (64.3% vs. 34.1%) and receptive UAI (68.8% vs. 22.2%). Multivariate models showed associations between HIV status and illegal drug use with UAI (for HIV status, odds ratio [OR] = 4.5, $p = .001$; for any illegal drug use, OR = 16.4, $p < .001$). There was no evidence that the influence of drug use moderated risk by HIV status. Rates of HIV disclosure and questioning did not differ by HIV status. **Conclusions:** HIV-positive men attending these events engaged in higher rates of illegal drug use and sexual risk than HIV-negative men. Prevention campaigns targeting MSM at high-risk events should include messages geared toward HIV-positive men. (*J. Stud. Alcohol Drugs, 74,* 158–167, 2013)

HIV CONTINUES TO disproportionately affect men who have sex with men (MSM). A recent data analysis by the Centers for Disease Control and Prevention (CDC) found that the rate of new HIV diagnoses among MSM is greater than 44 times the rate among other men (CDC, 2010a). Sexual risks, such as engaging in unprotected anal intercourse (UAI), account for the majority of these infections (CDC, 2012). The risk of HIV transmission among MSM engaging in sex appears to be heightened when these men are under the influence of substances such as crystal methamphetamine, erectile dysfunction drugs, and nitrite inhalants (or "poppers") (Ostrow et al., 2009; Plankey et al., 2007; Sullivan and Wolitski, 2007), and UAI appears to play a pivotal role in this transmission (e.g., Colfax et al., 2004; Mansergh et al., 2006). It is not entirely clear whether some MSM intend to use substances to enhance their risky sexual experiences, although there is some evidence to support this hypothesis (Kurtz, 2005; Semple et al., 2002; see also Ramchand et al., in press). Relationships between substance use and risky sex are of particular concern given that MSM tend to have higher rates of substance use than their heterosexual peers (Cochran et al., 2004; Ostrow and Stall, 2008; Stall and Wiley, 1988). Substance use and sexual risk are especially high among MSM while traveling (Bellis et al., 2004; Benotsch et al., 2006a, 2006b; Clift and Forrest, 1999; Crosby et al., 2003; Darrow et al., 2005; Whittier et al., 2005) and at party-oriented vacations (Benotsch et al., 2007; Lee et al., 2004; Mansergh et al., 2001; Mattison et al., 2001; Ross et al., 2003), events attended by gay and bisexual men that were once commonly referred to as "circuit parties." The prevalence of HIV-positive men at these events is also relatively high, ranging from 13% (Patel et al., 2006; Ross et al., 2003) to 25% (Lee et al., 2004). The purpose of this article is to examine substance use and sexual risk among HIV-positive gay and bisexual men at two party-oriented vacations.

Substance use among HIV-positive MSM is of concern for at least three reasons. First, it can result in negative health outcomes, either directly or because of interactions with antiretroviral medications. Among HIV-positive individuals, heavy alcohol use has been found to be associated with decreased cluster of differentiation 4 (CD4) cell counts or nonsuppression of HIV viral load (Baum et al., 2010; Hahn and Samet, 2010; Samet et al., 2007; Shacham et al., 2011), increased neurodegeneration or memory impairment (Fama et al., 2009, 2011; Persidsky et al., 2011), decreased health-related quality of life (Uphold et al., 2007), and increased mortality from various causes (Bonacini, 2011; Braithwaite et al., 2007; Katcher et al., 2010). Likewise, crystal methamphetamine use among HIV-positive individuals has been found to be associated with decreased CD4 cell counts or nonsuppression of HIV viral load (Fairbairn et al., 2011; King et al., 2009; Toussi et al., 2009), neurode-

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generation or memory impairment (Scott et al., 2007), and resistance to antiretroviral medications (Cachay et al., 2007; Colfax et al., 2007). Cocaine or crack-cocaine use among HIV-positive individuals has been found to be associated with decreased CD4 cell counts or nonsuppression of HIV viral load (Arnsten et al., 2002; Baum et al., 2009; Rafie et al., 2011), increases in hypertensive renal changes (Fine et al., 2007), and coronary stenosis (Lai et al., 2008).

Second, research suggests that up to one third of HIV-positive MSM may place uninfected individuals at risk for HIV infection (Parsons et al., 2003; see also Crepaz and Marks, 2002; Kalichman, 2000; Sullivan, 2005; Weinhardt et al., 2004). Although many HIV-positive MSM are motivated by a desire to reduce sexual risk (Frost et al., 2008; Serovich and Mosack, 2003; Wolitski et al., 2003), research also suggests that for some, sex without condoms may be "a default circumstance to be interrupted only when a partner asserts a need to protect himself" (Adam et al., 2008, p. 759). In other words, *telling* a sex partner about one's HIV status could aid in prevention in situations where seroconcordance is assumed and desired by one or more partner(s). Similarly, *asking* one's sex partner to disclose his status may also be associated with lower risk behavior (Horvath et al., 2010). Moreover, asking and telling among MSM have also been shown to be associated with one another (Zea et al., 2003). Because substance use has been shown to be associated with UAI (e.g., Colfax et al., 2004; Mansergh et al., 2006), it is possible that substance use could directly contribute to the tendency of some MSM to engage in UAI without disclosing their HIV status or ascertaining their partner's status or to engage in UAI even if one's partner is known to be serodiscordant.

Third, limited clinical evidence suggests that superinfection, or re-infection with a second HIV strain or subtype, may be of concern for HIV-positive MSM who engage in risky seroconcordant sex. Although researchers estimate that superinfections are present in less than 4% of sexually active MSM (Sidat et al., 2008) and that risk of superinfection is low (Cheonis, 2006; Diaz et al., 2005), superinfections—as well as co-infections (i.e., infection with two HIV strains at once)—have been found to be associated with lower CD4 cell counts (Cornelissen et al., 2012; Gottlieb et al., 2004; Smith et al., 2004) and greater increases of HIV viral load (Pacold et al., 2012; Smith et al., 2004). Because the likelihood of HIV-positive MSM engaging in risky seroconcordant or sero-unknown sex appears to increase with drug use (Purcell et al., 2005), superinfection may be a particular concern in settings where substance use is high.

In response to these concerns, researchers and public health officials have placed an emphasis on HIV prevention among HIV-positive MSM rather than solely focusing on MSM who are HIV negative and/or whose HIV status in unknown. Past behavioral interventions among HIV-positive MSM have targeted sexual risk (Coleman et al., 2009; Kalichman et al., 2001; McKirnan et al., 2010; Serovich et al., 2009; Simon Rosser et al., 2010; Williams et al., 2008) or sexual risk and drug use (Fisher et al., 2006; Lapinski et al., 2009; Mausbach et al., 2007; Rotheram-Borus et al., 2004; Velasquez et al., 2009; Wong et al., 2008). Many of these interventions have shown at least modest success in achieving their intended outcomes.

Although the rationale for and success of HIV prevention among HIV-positive individuals in the general MSM population is well established, it is less clear whether the need for these interventions exists within the context of events such as party-oriented vacations. Only a handful of studies have examined the behaviors of HIV-positive MSM in relation to HIV-negative MSM at these events, and the results are mixed. Some research has shown higher rates of sexual activity among HIV-positive MSM (Colfax et al., 2001; Xia et al., 2006) and higher rates of unprotected sex partners among HIV-positive MSM (Xia et al., 2006) at these events. However, at least one study found no significant differences in unprotected oral or anal sex among HIV-positive MSM at a party-oriented vacation (Patel et al., 2006). Research on the disclosure of HIV status found that approximately half of sexually active men disclosed their HIV status at one party-oriented vacation (Benotsch et al., 2007) and that 80% of HIV-positive men (vs. 71% of HIV-negative men) disclosed their status at another similar event (Patel et al., 2006). In developing interventions for MSM at high-risk events, it may be important to know, first, whether rates of substance use and sexual risk behaviors are higher among HIV-positive men, in which case prevention messages may need to be tailored toward this population. Second, knowing whether these behaviors are intended, and whether partners are disclosing to one another, can further inform prevention messages and strategies.

Although there is some evidence suggesting that sexual risk and drug use at party-oriented vacations may be higher among HIV-positive MSM, more evidence is warranted. In this article, we analyze data from RAND's PartyIntents study (RAND Corporation, Arlington, VA). We hypothesize that HIV-positive men attending one of two party-oriented vacations are more likely to engage in sexual risk and drug use over the course of the weekend than HIV-negative men in attendance. We explore substance use intentions among these groups to provide partial insight into whether substance use and risky sex could be intended co-occurring activities, particularly among HIV-positive men. We also explore whether rates of HIV status disclosure ("telling") and questioning ("asking") differ between HIV-positive and HIV-negative attendees.

Method

The methods used in this study were reviewed and approved by the RAND Corporation's Human Subjects Protection Committee.

Sample

Portal survey methodology (Voas et al., 2006) was used to recruit gay and bisexual men as they arrived at one of two weekend parties catering to them (one held in the Southeast United States; one held in the Northeast United States) and characterized by multiple dance events. Specifically, this involved positioning survey staff at the entrance to each party and approaching potential respondents to determine eligibility as they crossed an invisible line. To be eligible, individuals had to be male, be age 21 years or older (the minimum age required to attend the dance parties), identify as gay or bisexual, and be planning on attending at least one of the weekend party events. Those eligible then completed an anonymous, self-administered paper survey. Recruitment spanned the entire day and occurred over multiple days to ensure a representative sample. Men were encouraged to complete an anonymous follow-up assessment in person before leaving the event or online for up to 2 weeks after the event. Baseline and follow-up responses were linked using responses to three security questions, and participants were remunerated for their participation in each survey.

A total of 489 of 504 eligible respondents completed the anonymous baseline assessment when they were recruited (239 at the Northeast event location and 250 at the Southeast location). Data on the reasons for refusal were not systematically recorded, although survey staff reported that the time required to complete the survey was a concern for several potential respondents. Across both sites, 232 respondents (47%) completed the anonymous follow-up assessment in person (n = 147) or online (n = 85). Nonresponse weights indicate little difference between those who completed the follow-up assessment relative to those who did not (Ramchand et al., 2011, in press). Responses from the anonymous surveys were linked using unique combinations of responses from three security questions.

Measures

Baseline and follow-up surveys asked questions about party attendees' intentions to engage in sexual risk and drug use, as well as their actual behaviors. Intentions were ascertained in addition to actual behaviors to explore how beliefs about peer drug use interact with individuals' own drug use intentions to predict use. These results are reported elsewhere (Ramchand et al., in press), whereas intentions among HIV-positive individuals in particular are presented in this article. For purposes of this article, the follow-up survey asked questions to ascertain data on condom use, disclosure/questioning of HIV status, and substance use.

Demographic data. At the baseline assessment, respondents were asked a number of questions that aided us in describing them demographically. These questions were related to respondents' age, prior attendance at the same party in past years, prior attendance at similar parties, highest level of education completed, employment status, zip code of residence (if residing in the United States) or country of residence, race/ethnicity, and relationship status. We also asked respondents who, if anyone, accompanied them to the event (e.g., partner, boyfriend, or friend).

HIV status. At baseline, respondents were asked whether they had ever tested positive for HIV. Response options were "yes" and "no."

Condom use. At the follow-up assessment, respondents were asked, "Over the course of the weekend, when you engaged in ["giving oral sex," "getting oral sex," "giving anal sex," and "getting anal sex"] with someone other than a regular sex partner, did you use a condom . . . ?" Response options were *every time, most times, never,* and *did not have this type of sex with a nonregular sex partner this weekend.* For purposes of our analysis, condom use was defined as reporting *every time.*

Disclosure/questioning of HIV status. Questions about disclosure/questioning of HIV status were added after the first round of data collection and were therefore asked at follow-up at the Northeast event only. Respondents at the Northeast event were asked, "Over the course of the weekend, when you engaged in ["giving oral sex," "getting oral sex," "giving anal sex," and "getting anal sex"] with someone other than a regular sex partner, did you ask about their HIV status?" They were also asked, "Over the course of the weekend, when you engaged in ["giving oral sex," "getting oral sex," "giving anal sex," and "getting anal sex"] with someone other than your regular sex partner, did you tell them your HIV status?" Response options were *every time, most times, never,* and *did not have this type of sex with a nonregular sex partner this weekend.* For purposes of our analysis, disclosure and questioning of HIV status were defined as reporting *every time.*

Substance use intentions. At baseline, respondents were asked, "How likely is it that over the course of the weekend you will use [Ecstasy; ketamine; alcohol; alcohol (five or more drinks in a 2-hour period, asked only at the Northeast event); crystal methamphetamine; GHB or GBL; marijuana; cocaine or crack; Viagra, Cialis, or Levitra without a prescription; poppers; and LSD/mushrooms]?" Response options were *not at all likely, somewhat unlikely, somewhat likely,* and *very likely.* For purposes of our analysis, substance use intention was defined as reporting *somewhat likely* or *very likely.*

Substance use. At follow-up, respondents were asked, "Over the course of the weekend, when did you use [Ecstasy; ketamine; alcohol; alcohol (five or more drinks in a 2-hour period); crystal methamphetamine; GHB or GBL; marijuana; cocaine or crack; Viagra, Cialis, or Levitra without a prescription; poppers; and LSD/mushrooms]?" Respondents were instructed to "mark all that apply," and response options were *did not use,* or *used Thursday, used Friday, used*

Saturday, used Sunday, and *used Monday.* For purposes of our analysis, use of a given substance was defined as reporting having used that substance 1 or more days over the course of the weekend.

Analysis

We first present the demographic profile of the total sample at baseline and of those who completed the study follow-up. Next, we used logistic regression that controlled for party location to identify whether HIV-positive men were more likely than HIV-negative men to intend to use drugs, actually use drugs, and—among those who reported having each of the four types of sexual behaviors (giving oral, getting oral, giving anal, and getting anal)—use a condom "every time" over the weekend. We also examined differences by self-reported HIV status in disclosure of HIV status among those who engaged in each of the four types of sexual behaviors, although this series of questions was asked of men at the Northeast event only. Finally, we ran a multivariate logistic regression model estimating the likelihood of engaging in UAI as a function of whether respondents used any illegal drug (Ecstasy [3,4-methylenedioxymethamphetamine; MDMA]; ketamine; crystal methamphetamine; GHB [gamma-hydroxybutyrate] or GBL [gamma-butyrolactone]; marijuana; cocaine or crack; sildenafil [Viagra], tadalafil [Cialis], or vardenafil [Levitra] without a prescription; poppers; and LSD [lysergic acid diethylamide]/mushrooms) and HIV status. We also tested whether the effect of drug use on UAI was moderated by HIV status.

Results

Study sample

Descriptive characteristics of the study sample at baseline and follow-up are presented in Table 1. The sample was generally evenly split between the Northeast and Southeast event locations. Seventeen percent of those surveyed at baseline reported having tested positive for HIV. Age was uniformly distributed between 21 and 54 years; the mean age at baseline was 36 (*SE* = 0.4). The samples both at baseline and follow-up were also largely White/non-Hispanic (71% and 77%, respectively), educated with at least a bachelor's degree (82% and 85%, respectively), and employed full time (84% and 85%, respectively). Around half reported their relationship status as single. Also, about half lived in or around the metropolitan area where the party was being held, whereas roughly 10% lived outside of the United States. Again, nonresponse weights suggest little difference between those who did and did not complete the follow-up assessment; more details about nonresponse weights and the study sample generally are presented elsewhere (Ramchand et al., 2011, in press).

Table 1. Descriptive characteristics of PartyIntents study sample

Variable	Baseline *n* (%)	Follow-up *n* (%)
Total	489 (100)	232 (100)
Party location		
Northeast U.S.	239 (49)	122 (53)
Southeast U.S.	250 (51)	110 (47)
Age		
21–30	150 (31)	64 (28)
31–40	133 (27)	64 (28)
41–54	146 (30)	74 (32)
≥55	12 (2)	6 (3)
Race		
White, Non-Hispanic	349 (71)	178 (77)
Black, Non-Hispanic	21 (4)	7 (3)
Asian, Non-Hispanic	19 (4)	9 (4)
Other, Non-Hispanic	13 (3)	7 (3)
Hispanic	87 (18)	31 (13)
Relationship status		
Married	32 (7)	11 (5)
Live-in male partner	137 (28)	73 (31)
Steady boyfriend	73 (15)	33 (14)
Single	247 (51)	115 (50)
Educational attainment		
Less than college	85 (17)	35 (15)
Bachelor's	220 (45)	102 (44)
Postgraduate studies	183 (37)	95 (41)
Employment status		
Full time	413 (84)	197 (85)
Part time/student	29 (6)	12 (5)
Other	44 (9)	23 (10)
Residential status[a]		
Within metro area	215 (44)	100 (43)
Outside metro area, within U.S.	217 (41)	107 (46)
Outside U.S.	53 (11)	25 (11)
Tested positive for HIV	83 (17)	39 (17)

[a]Metro area was defined as the metropolitan statistical area in which the party was located for the Southeast site and as the closest city with more than 100,000 persons to the Northeast site.

Drug use: Intentions and weekend behaviors

As shown in Table 2, HIV-positive respondents at baseline were significantly more likely than HIV-negative attendees to intend to use crystal methamphetamine (13.3% vs. 5.7%), recreational erectile dysfunction drugs (36.1% vs. 18.7%), and poppers (25.3% vs. 16.2%). Although there were no statistically significant differences between HIV-positive and HIV-negative men's intentions to use other drugs, it is notable that the prevalence of drug and alcohol use intentions was high among the overall sample—upwards of 60% intended to use one or more drugs, excluding alcohol, and more than 90% anticipated using any drug or alcohol. More than 40% of attendees intended to use Ecstasy over the course of the weekend, and roughly one fifth of attendees intended to use cocaine or crack. Anticipated alcohol use was also high, with more than 80% of attendees expecting to drink over the course of the weekend.

As documented in a separate publication (Ramchand et al., in press), intending to use a specific drug was the

TABLE 2. Intended and actual drug use over the weekend, by HIV status

	Intentions to use			Weekend drug use		
Drug use	HIV positive (*n* = 83) *n* (%)	HIV negative (*n* = 402) *n* (%)	*p*	HIV Positive (*n* = 39) *n* (%)	HIV Negative (*n* = 189) *n* (%)	*p*
Any drug or alcohol	76 (91.6)	372 (92.5)	.798	36 (92.3)	182 (96.3)	.338
Any drug, excluding alcohol	61 (73.5)	256 (63.7)	.096	28 (71.8)	123 (65.1)	.345
Ecstasy	40 (48.2)	174 (43.3)	.465	19 (48.7)	78 (41.3)	.497
Ketamine	12 (14.5)	59 (14.7)	.948	6 (16.2)	25 (13.5)	.558
Alcohol	67 (80.7)	336 (83.6)	.592	32 (88.9)	164 (87.2)	.652
Alcohol, heavy use[a]	14 (40)	111 (54.7)	.111	6 (46.2)	67 (65)	.191
Crystal methamphetamine	11 (13.3)	23 (5.7)	.028	6 (15.8)	11 (5.9)	.075
GHB or GBL	20 (24.1)	75 (18.7)	.327	7 (18.9)	35 (18.7)	.827
Marijuana	16 (19.3)	90 (22.4)	.650	5 (13.5)	41 (21.9)	.434
Cocaine or crack	14 (16.9)	93 (23.1)	.287	11 (30.6)	46 (24.7)	.285
Recreational ED meds	30 (36.1)	75 (18.7)	.001	9 (24.3)	32 (17.1)	.361
Poppers	21 (25.3)	65 (16.2)	.046	9 (24.3)	20 (10.7)	.021
Psychedelics	2 (2.4)	8 (2)	.736	0 (0)	0 (0)	N.A.

Note: p values derive from logistic regression models that control for party location (i.e., Northeast or Southeast site). GHB = gamma-hydroxybutyrate; GBL = gamma-butyrolactone; ED = erectile dysfunction; N.A. = not applicable. [a]Asked at the Northeast event only.

strongest predictor of actual use, with a mean bivariate odds ratio across all drug categories of 53 and ranging from 16 (poppers) to 129 (crystal methamphetamine) (data not shown). There were no differences in the relationship between intentions and drug use among HIV-positive and HIV-negative men. As shown in Table 2, HIV-positive attendees were significantly more likely than HIV-negative attendees to report having used poppers (24.3% vs. 10.7%). No significant differences were found in the use of other drugs or alcohol among HIV-positive and HIV-negative attendees. Again, however, consistent with attendees' intentions, drug and alcohol use among the overall sample was notably high—more than 65% used one or more drugs, excluding alcohol, and more than 90% used any drug or alcohol. Greater than 40% of attendees reported using Ecstasy over the weekend, approximately one fourth of all attendees used cocaine or crack, and nearly 90% of attendees consumed alcohol over the course of the weekend. Rates of heavy drinking (defined as five or more drinks in a 2-hour period) at the Northeast event were high, and although not statistically significant, a lower percentage of HIV-positive attendees engaged in heavy drinking than did HIV-negative attendees (46.2% vs. 65.0%).

Unprotected anal intercourse

As shown in Table 3, HIV-positive attendees were significantly more likely than HIV-negative attendees to have unprotected receptive anal intercourse (68.8% vs. 22.2%) and insertive anal intercourse (64.3% vs. 34.1%) over the course of the weekend. In multivariate models (not shown in tables), both HIV status and illegal drug use were independently associated with UAI (for HIV status, odds ratio [OR] = 4.5, $p = .001$; for any illegal drug use, OR = 16.4, $p < .001$). There was no evidence that the influence of drug use moderated risk by HIV status.

TABLE 3. Condom use among those who report having sex over the weekend, by HIV status

Variable	HIV positive *n* (%)	HIV negative *n* (%)	*p*
Giving oral sex	(*n* = 21)	(*n* = 67)	
No condom used	20 (95.2)	60 (89.6)	.372
Getting oral sex	(*n* = 22)	(*n* = 73)	
No condom used	21 (95.4)	67 (91.8)	.557
Giving anal sex	(*n* = 14)	(*n* = 44)	
No condom used	9 (64.3)	15 (34.1)	.041
Getting anal sex	(*n* = 16)	(*n* = 36)	
No condom used	11 (68.8)	8 (22.2)	.002

Note: p values derive from logistic regression models that control for party location (i.e., Northeast or Southeast site).

TABLE 4. HIV disclosure and questioning among those who report having sex over the weekend, by HIV status[a]

Variable	HIV positive *n* (%)	HIV negative *n* (%)	*p*
Giving oral sex	(*n* = 10)	(*n* = 39)	
Asked status	2 (25)	8 (19.5)	.725
Told status	2 (25)	7 (17.9)	.646
Getting oral sex	(*n* = 12)	(*n* = 44)	
Asked status	3 (37.5)	3 (37.5)	.243
Told status	3 (37.5)	9 (19.1)	.256
Giving anal sex	(*n* = 11)	(*n* = 21)	
Asked status	1 (16.7)	10 (40)	.303
Told status	1 (16.7)	9 (36)	.378
Getting anal sex	(*n* = 7)	(*n* = 20)	
Asked status	1 (16.7)	6 (30)	.525
Told status	0 (0)	5 (25)	N.A.

Notes: N.A. = not applicable. [a]Asked at the Northeast event only.

HIV disclosure and questioning

As shown in Table 4, rates of HIV disclosure and questioning (collected at the Northeast event only) were not significantly different for HIV-positive and HIV-negative attendees. It is worthwhile to note, however, that many attendees—both HIV positive and HIV negative—reported engaging in sex without asking their partner's HIV status or telling their own HIV status. For example, only one HIV-positive individual engaging in insertive anal sex consistently told his partners of his HIV status.

Discussion

The results of our study support what a handful of studies have shown previously; HIV-positive MSM tend to engage in higher rates of sexual risk at party-oriented vacations than do HIV-negative men (Colfax et al., 2001; Xia et al., 2006). Furthermore, our findings show that HIV-positive MSM used poppers at higher rates than HIV-negative men, and that this use was largely intended. This drug has been shown elsewhere as being popular during sex and associated with unprotected sex (Colfax et al., 2001). However, our findings suggest no evidence that the increased use of drugs among HIV-positive MSM accounts for their increased sexual risk, nor do we find evidence that there is a differential effect of drug use on transmission behaviors between HIV-positive and HIV-negative individuals.

Together, these results suggest that the reasons for drug use and sexual risk behaviors at party-oriented vacations are complex and multifaceted. It is not immediately clear why HIV-positive MSM engage in higher rates of drug use and sexual risk behaviors than HIV-negative men, particularly because weekend drug use does not account for the increased sexual risk. One possible explanation is that some MSM attendees intend to engage in risky sex and use drugs such as poppers and crystal methamphetamine merely to enhance their sexual experiences, and that this group is disproportionately HIV positive. This would stand in contrast to the idea that individuals are likely to engage in risky sex simply as a result of drug-induced disinhibition (see Aguinaldo and Myers, 2008; McKirnan et al., 1996). In other words, drug use and unprotected sex may be planned co-occurring activities. Our data on drug use intentions appear to support but cannot confirm this idea because it is unknown whether unprotected sexual behaviors at these two party-oriented vacations were themselves intended. Preliminarily, these results indicate that prevention efforts, particularly those aimed at HIV-positive individuals, may benefit from focusing on factors that lead to intentions to engage in drug use and possibly sexual risk behaviors rather than or in addition to contextual factors at high-risk events. However, further research on intentions, particularly sexual intentions, is needed.

Our data also show that HIV-positive men are more likely than HIV-negative men to engage in unsafe insertive and receptive anal intercourse. This is of concern not only because of possible transmission risk to HIV-negative partners but also because of the risk of superinfection among those who are already HIV positive. Moreover, because our results show that drug use among HIV-positive individuals is high, possible impacts on health, directly or because of interactions with antiretroviral medications, should be considered. This has important implications for those who treat HIV-positive MSM, as they should continue to advocate that their patients abstain from drug use and perhaps reinforce these messages when they learn that their patients are going on vacation.

Our study's results also suggest that HIV disclosure and questioning practices do not differ among HIV-positive and HIV-negative attendees at these events. Disclosure and questioning rates were low among both groups. In contrast to an earlier study of a party-oriented vacation which found that approximately half the men engaging in anal sex disclosed their HIV status to all their partners (Benotsch et al., 2007; Gorbach et al., 2004), only 26.8% of men in our study who engaged in anal sex disclosed their HIV status, whether positive or negative, to all their partners. This is of particular concern because previous research suggests that substance use may inhibit disclosure practices by HIV-positive MSM (Semple et al., 2006) and increase the likelihood of unsafe sex without disclosure (Marks and Crepaz, 2001; Purcell et al., 2005). These findings may be the result of the portal survey methodology used in the current study, which is intended to provide more generalizable results than past studies (of different populations) that have relied largely on samples of convenience (see Johnson et al., 2006; Kelley-Baker et al., 2007; Lange et al., 1999; Voas et al., 2006).

Future studies should look to explain decreased HIV disclosure in high-risk settings such as this. One plausible explanation is that recent research showing reduced transmission risk among HIV-positive individuals on antiretroviral therapy (Cohen et al., 2011; Donnell et al., 2010; Grant et al., 2010) could affect risk perceptions and resulting behaviors. Although one of many possible explanations, this could be particularly important to examine in settings where substance use is high (see Kalichman et al., 2011), because substance use has been shown to negatively affect HIV treatment adherence and viral load counts (Arnsten et al., 2002; Baum et al., 2009, 2010; Fairbairn et al., 2011; Hahn and Samet, 2010; King et al., 2009; Shacham et al., 2011; Toussi et al., 2009) as well as resistance to antiretroviral medications (Cachay et al., 2007; Colfax et al., 2007).

Our findings should be considered in light of the study's limitations. First, although our baseline response rate was high, only 47% of respondents originally recruited at baseline completed the follow-up assessment. It is possible that nonresponse bias may affect our results; however, response

rates did not differ significantly by HIV status. Second, respondents' HIV status, sexual behavior, and drug use were all self-reported. Prior research involving HIV status suggests that at least a small percentage of the men reporting to be HIV negative may in fact be HIV positive and unaware of it or may not have wanted to disclose their HIV-positive status (Pedrana et al., 2012; Williamson et al., 2008). If we were to apply the results of past research (CDC, 2010b) and assume that one third of those with HIV did not know that they were infected, as many as an additional 8.7% of the attendees at the event may be HIV positive but not know it. Third, our data do not show whether HIV-positive respondents who did not use a condom during sex were having sex with others who were also HIV positive. Therefore, we cannot determine whether the unsafe sexual acts of these respondents put HIV-negative men at risk for HIV infection or put HIV-positive men at risk for superinfection. Fourth, we did not have a large enough sample size to control for other variables when comparing risk behaviors among the HIV-positive sample with those among the HIV-negative sample. Risk behaviors could vary based on factors such as age, race/ethnicity, or educational attainment, and future studies should account for this possibility. It is also plausible that antiretroviral treatment status may have an effect on risk behaviors, particularly if MSM perceive there to be a lower risk of transmission while on antiretroviral treatment, and those who reported being HIV positive were not asked about their medical management. Finally, our study does not address whether party-oriented vacations actually lead to increased sexual risk and substance use or whether these events are simply settings wherein high-risk MSM engage in the same behaviors they engage in while in their home cities. Therefore, our study does not provide insight into whether party-oriented vacations are the only or optimal site for public health intervention but indicates that intervention is important for MSM who attend these events.

Researchers who have studied high-risk behaviors at party-oriented vacations have recommended that more HIV prevention is needed among HIV-positive MSM (Patel et al., 2006). Our research supports this recommendation. However, it is crucial not to place undue emphasis on this population at the cost of increasing stigma toward or discrimination against HIV-positive individuals. Some studies show that HIV-positive individuals engage in more safe sex behaviors than those who are HIV negative (e.g., Robinson et al., 2011) and that many HIV-positive individuals are motivated by a desire to reduce sexual risk (Frost et al., 2008; Rutledge, 2009; Serovich and Mosack, 2003; Wolitski et al., 2003). Moreover, given the complex and unclear relationship between drug use and unprotected sex at high-risk events, interventions should target factors in addition to, or other than, drug use alone. In particular, it is worth considering and further exploring factors that could affect men's intentions to engage in drug use and possibly unprotected sex at high-risk events.

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