

Prevalence and Correlates of Substance Use Among Young Asian Pacific Islander Men Who Have Sex with Men

Don Operario,^{1,6} Kyung-Hee Choi,² Priscilla Lee Chu,³ Willi McFarland,^{2,3} Gina M. Secura,⁴ Stephanie Behel,⁵ Duncan MacKellar,⁵ and Linda Valleroy⁵

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We examined patterns of substance use among young Asian Pacific Islander (API) men who have sex with men (MSM). Participants ($N = 496$) were recruited from sampled venues and were interviewed on substance use, sexual behaviors, and attendance at MSM social venues. Substance use prevalence was highest for alcohol (94% lifetime, 89% past 6 months), marijuana (61% lifetime, 44% past 6 months), and methylenedioxymethamphetamine or ecstasy (58% lifetime, 47% past 6 months). During the past 6 months, 24% used an illicit substance weekly or more often, 51% used club drugs, and 44% used 3 or more illicit substances. Multivariate models identified common and unique correlates of frequent drug use, club drug use, and polydrug use. Associations between substance use and sexual risk behaviors also emerged. These findings suggest a need to improve substance use and HIV prevention intervention efforts for young API MSM.

KEY WORDS: substance use; Asian Pacific Islander; gay and bisexual men.

INTRODUCTION

There is a tendency to view Asian Pacific Islanders (APIs) in the United States as having low risk for substance use (Maddahian *et al.*, 1985; Bachman *et al.*, 1991). The perception of APIs as a “model minority” bolsters this perception (Zane & Kim, 1994). According to this belief, APIs represent a socioeconomically privileged minority group having only modest risk for adverse psychosocial and health outcomes such as substance use (Chen & Hawks, 1995). Epidemiological data from national samples have suggested that APIs experience the lowest substance

use rates compared with African Americans, Latinos, and White Americans (Bachman *et al.*, 1991; Maddahian *et al.*, 1985; SAMHSA, 2002). However, some studies challenge this categorical view with findings that show high substance use among certain API demographic subgroups (Ellickson & Morton, 1999; Nemoto *et al.*, 2002; Oetting *et al.*, 2000; Price *et al.*, 2002). Recent assessments have indicated that there exist few substance use prevention or treatment programs for API individuals and that approximately 10% of APIs in need of substance use treatment obtain services (Chow, 2002; NAPAFA, 2001). Researchers have argued that studies must look within the general API category to identify particular subgroups at high risk for substance use, as well as examine the social context for substance use, in order to develop appropriate prevention and treatment interventions (Harachi *et al.*, 2001; Nemoto *et al.*, 1999). API men who have sex with men (MSM) is one particular API subcategory that warrants attention for further research into substance use prevalence and prevention strategies.

Studies of young MSM in general (predominantly White samples) have shown high levels of substance use (Crosby *et al.*, 1998). An analysis of

¹Department of Social Policy and Social Work, University of Oxford, Oxford, United Kingdom.

²Center for AIDS Prevention Studies, University of California San Francisco, San Francisco, California.

³San Francisco Department of Public Health, San Francisco, California.

⁴School of Public Health, St. Louis University, St. Louis, Missouri.

⁵Centers for Disease Control and Prevention, Atlanta, Georgia.

⁶Correspondence should be directed to Don Operario, Department of Social Policy and Social Work, University of Oxford, 32 Wellington Square Oxford OX1 2ER, United Kingdom; e-mail: don.operario@socres.ox.ac.uk.

the San Francisco Young Men's Study, a probability household sample of single men between the ages of 18 and 29 in San Francisco by Greenwood *et al.* (2001), found the most common drugs used were marijuana (69%), methylenedioxymethamphetamine (MDMA) (37%), hallucinogens (37%), and methamphetamines (30%), and that 43% of the sample engaged in polydrug use—that is, three or more drugs—during the past year (Greenwood *et al.*, 2001). Stall *et al.* (2001) also examined substance use behaviors in a probability sample of MSM in four urban areas, and found that MSM between 18 and 29 years of age were 2.6 times more likely to engage in polydrug use compared to older men (50 years and older).

Substance use is a potent risk factor for HIV infection (see Stall & Purcell, 2000, for a review). Strong associations between substance use and sexual risk behavior among young MSM have been documented (Chesney *et al.*, 1998; Woody *et al.*, 1999). A family of specific substances referred to as club drugs is widely used in MSM-themed dance clubs and circuit parties (i.e., weekend-long parties that cater to MSM clientele) and has been shown to be associated with sexual risk behaviors (Colfax *et al.*, 2001; Mattison *et al.*, 2001; Ross & Williams, 2001). These substances include MDMA, methamphetamines, gamma-hydroxybutyrate (GHB), ketamine, and lysergic acid diethylamide (LSD). Prevalence of club drugs is high among young MSM (Koesters *et al.*, 2002; Tong & Boyer, 2002). However, to date most substance use and club drug prevalence studies have not included large samples of young MSM of color in general, or young API MSM in particular.

There is a need to identify and describe health risk behaviors such as substance use in the API MSM community. No known studies have examined prevalence and correlates of frequent drug use, club drug use, and polydrug use among API MSM. Preliminary findings suggest a link between substance use and unprotected sex among API MSM. A study of 241 API MSM revealed that substance use was associated with a fivefold increased likelihood for engaging in unprotected anal sex (Choi *et al.*, 1995). Focus groups with API MSM indicated that alcohol and drug use were seen as normative behaviors among young gay men who frequent gay bars and clubs to meet other men, and that young API MSM may rely on substances to uninhibit themselves socially and sexually (Nemoto *et al.*, 2003). In another study of 40 young API MSM, participants attributed their un-

safe sexual behaviors to losing control of their judgments and behaviors while under the influence (Choi *et al.*, 1999). However, specific drugs used by young API MSM have not been examined, and little is known about demographic and behavioral patterns associated with their drug use.

In this paper, we present data from the Asian Counseling and Testing (ACT) study (see Choi *et al.*, 2004, for more details) to provide an epidemiological profile of substance use among young API MSM in San Francisco. This is one of the first known studies to do so with a large API MSM sample. The paper investigates three research questions: (1) What is the prevalence of illicit substance use in young API MSM? (2) What are the correlates of three specific types of substance use—frequent drug use, club drug use, and polydrug use? and (3) In what ways are substance use associated with sexual behavior? Findings from this study can offer an important preliminary step toward developing substance use and HIV prevention intervention strategies for this understudied ethnic and sexual minority group.

METHODS

Sample and Procedure

Participants were recruited between January 2000 and September 2001 using the venue-based, time/space sampling procedure developed by the Centers for Disease Control and Prevention for their Young Men's Survey (Mackellar *et al.*, 1996).

Before and throughout the survey, research staff identified all venues frequented by API MSM in San Francisco. Formative research was conducted to identify all possible venues by reviewing local publications, interviewing key community informants, and meeting with focus groups of young gay men. When the staff found venues, they would identify the days of the weeks and times of day when API MSM frequented the venues. Staff would then visit those venues and conduct enumerations and brief street interviews with API men at the venue. Ethnically heterogeneous populations were present at most venues; the venues that consisted of predominantly Asian men were social organizations for API individuals. A sampling frame was then developed of venues deemed to yield at least seven eligible men in a 4-h period. The cutoff of 7 was chosen for logistical and efficiency purposes. Types of venues identified included bars, clubs, shopping blocks,

Table 1. Sample Characteristics

Variable	%	N
Ethnicity		
Filipino	28	137
Chinese	27	135
Vietnamese	16	79
Thai	4	20
Japanese	4	19
Korean	3	16
Multi-ethnic, including API	10	47
Other Asian	8	38
Other Pacific Islander	4	2
Age (years; mean: 24)		
18–24	49	244
25–29	51	252
Birthplace		
U.S.-born	30	149
Foreign-born	70	347
Highest level of education completed		
No college	17	85
Some college	33	162
College graduate	50	249
Sexual orientation		
Gay	82	407
Bisexual	13	65
Other	5	24
Degree of being “out”^a		
To more than half the people respondent knew	56	276
To half or less than half the people respondent knew	40	200
Not out to anyone	4	18
Frequency of “clubbing” in the past 6 months^b		
Never	3	13
Less than once a month	11	55
Once a month	12	61
2–3 times a month	26	130
Once a week	29	145
2–3 times a week	17	85
Every day or almost every day	1	7
Ever attended a circuit party		
Yes	20	98
No	80	397
Number of male sex partners in the past 6 months (median: 2)		
0	6	29
1	31	152
2–5	45	221
6–10	11	55
11–100	8	39
Any sex while under the influence of illicit drugs in the past 6 months		
Yes	49	243
No	51	253
Any unprotected anal intercourse in the past 6 months		
Yes	47	234
No	53	262

Table 1. Continued

Variable	%	N
Unprotected insertive anal intercourse in the past 6 months		
Yes	39	192
No	61	304
Unprotected receptive anal intercourse in the past 6 months		
Yes	35	173
No	65	323

Note. Some variables do not sum to 496 because of missing values. “Being “out” refers to the extent to the participant has disclosed to others that he is gay or homosexual.

^b“Clubbing” refers to attendance at MSM-oriented clubs.

street corners, public places (i.e., parks), bath-houses/sex clubs, social organizations, and fitness clubs. During the course of the study, venues were added or deleted and day/time periods were adjusted depending on whether they met the criterion of finding seven eligible men to participate.

During each 4-h sampling event (e.g., at a specified bar on Saturday night between 10 p.m. and 2 a.m.), individuals who appeared to meet eligibility criteria were approached and screened. Because a primary goal of this project was to examine risk behaviors among young MSM, API men who appeared to be 29 years and younger were targeted (Choi *et al.*, 2004). Eligibility criteria were (1) being male, (2) being of Asian or Pacific Islander descent, (3) being between 18 and 29 years of age, (4) sexual encounter with at least one other man in their lifetime, and (5) residing in one of the six counties of the San Francisco Bay Area (San Francisco, Alameda, Marin, Contra Costa, Santa Clara, San Mateo). We minimized the likelihood of recruiting men more than once by asking each individual if they had already participated in our study.

In all, the team went to 27 different venues. Because of the random selection of venues according to time sampling period, some venues may have been sampled more than once. An eligibility screener was used to determine men’s age, ethnicity, residence, and if they had previously participated in the survey. A total of 2,393 men were approached. Some men ($n = 259$) would not stop to complete the eligibility screener. Eligibility was assessed for those men who did complete the screener ($n = 2,134$; 89% of those approached). Men who were screened as eligible ($n = 909$) were told what the study was about and asked to participate. There are a wide range of reasons eligible men refused to participate, including not having enough time, meeting friends, going to work, having recently been tested for HIV, discomfort with

Table 2. Substance Use Prevalence (Lifetime and 6 Months)

Variable	Lifetime use (%)	6-month use (%)	Levels of use in the past 6 months ^a (%)					
			Never	< 1 time a month	Monthly	2–3 times a month	Weekly	>1 time a week
Alcohol	94	89	11	23	12	20	19	15
Marijuana	61	44	56	25	6	5	4	5
MDMA (ecstasy)	58	47	53	20	8	12	4	3
LSD	28	13	87	11	1	< 1	< 1	0
Poppers or nitrites	29	16	84	11	2	< 1	1	< 1
Speed/crystal	29	20	80	11	2	3	1	2
Cocaine or crack	20	10	90	7	1	1	< 1	< 1
Special K	26	20	80	13	2	4	< 1	< 1
GHB	21	18	82	10	4	3	< 1	< 1
Uppers	10	5	95	4	< 1	< 1	< 1	< 1
Downers/other barbituates	6	4	96	2	< 1	< 1	< 1	< 1

^aIncludes everyone regardless of their lifetime use.

needles, not interested in the project, and not interested in being tested. Participation rates were not significantly different by age and ethnicity.

Eligible men who agreed to participate ($n = 566$) were escorted to a large recreational vehicle that contained a private interview and counseling space. Participants provided informed consent and were interviewed using a standardized questionnaire. Participants also had their blood drawn via venipuncture (see Choi *et al.*, 2004, for more detail on HIV posttest counseling procedure and seroprevalence data). Specimens of suspected duplicate enrollees who reported the same ethnicity and date-of-birth were tested using a human antibody fingerprinting method (Viral & Rickettsial Disease Laboratory, CA DHS, Richmond, CA). When antibody profiles matched, we considered that specimens were from the same person and only analyzed data from the first enrollment. Following the interview participants received \$50. All study procedures were approved by the institutional review board of CDC and the University of California, San Francisco.

Measures

Participants were asked about general sociodemographic background characteristics including ethnicity, age, birthplace, and highest level of education completed. They described their sexual orientation (response options included *gay [homosexual]*, *bisexual*, *straight [heterosexual]*, *none of the above*, or *other*) and assessed their degree of being “out”

to others using a scale from 1 (*not out to anyone*) to 7 (*out to everyone*). Participants described their frequency of attending gay clubs during the past 6 months using a scale from 1 (*never*) to 7 (*every day or almost every day*) and whether they had ever attended a circuit party. They also described their sexual behaviors during the past 6 months, including number of sex partners and ever having unprotected anal sex.

Participants described whether they had ever used various substances during their lifetime and during the past 6 months (response categories *yes/no*), and for each substance used during the past 6 months, how frequently they used the substance (response categories included *less than once a month*, *once a month*, *2–3 times a month*, *weekly*, *more than weekly*), and whether they were ever “high” or “buzzed” on each specified substance during sex in the past 6 months. Substance categories included alcohol, marijuana, MDMA/ecstasy, LSD/hallucinogens, poppers/nitrate inhalants, crystal/speed, cocaine or crack, Special K, GHB, uppers (other than crystal or cocaine), downers or other barbituates, heroin, or any other drugs.

Frequent drug use reflected use of any illicit substance (all substance categories except alcohol) weekly or more frequently during the past 6 months. *Club drug use* reflected any use of MDMA/ecstasy, crystal/speed, GHB, ketamine/Special K, or LSD during the past 6 months (defined according to NIDA, 2000). *Polydrug use* reflected the use of three or more illicit substances during the past 6 months.

Table 3. Correlates of Three Substance Use Outcomes—Frequent Drug Use, Club Drug Use, Polydrug Use (Past 6 Months)

	Frequent drug use ^a		Club drug use ^b		Polydrug use ^c	
	% Yes	<i>p</i> value	% Yes	<i>p</i> value	% Yes	<i>p</i> value
Total	24		51		44	
Ethnicity		.27		< .01		.12
Filipino	27		53		50	
Chinese	17		39		35	
Vietnamese	19		57		40	
Thai	32		65		58	
Japanese	13		47		44	
Korean	20		81		60	
Multi-ethnic	37		57		51	
Other Asian	25		42		34	
Other Pacific Islander	50		50		50	
Age (years)		.06		.06		.23
18–24	28		55		47	
25–39	20		46		41	
Birthplace		< .01		.01		< .01
U.S.-born	33		59		54	
Foreign-born	19		47		40	
Education		< .01		.08		.09
No college	32		61		54	
Some college	32		51		43	
College graduate	16		47		41	
Sexual orientation		.83		.54		.88
Gay	24		51		44	
Other (bisexual, straight)	23		48		43	
Degree of being “out” to others ^d		< .01		< .001		< .001
Less than half of people	15		42		34	
More than half of people	30		58		52	
Frequency of clubbing, 6 months		.56		< .001		< .001
Once a month or less	22		30		25	
More than once a month	25		58		50	
Ever attended a circuit party		.44		< .001		< .001
Yes	27		70		65	
No	23		46		39	
Multiple sex partners, 6 months ^e		.99		< .001		< .001
Yes	24		57		52	
No	24		40		31	
Sex under the influence, 6 months ^f		< .001		< .001		< .001
Yes	32		70		70	
No	12		32		19	
Unprotected anal sex, 6 months		.17		< .01		< .001
Yes	27		57		53	
No	21		45		35	

Note. All *p* values are associated with chi-square tests.

^aDefined as weekly use or more of any illicit substance excluding alcohol.

^bDefined as any use of methylenedioxymethamphetamine (ecstasy), methamphetamines (speed), gamma-hydroxybutyrate (GBH), ketamine [special K], lysergic acid diethylamide (LSD).

^cDefined as using ≥ 3 drugs, excluding alcohol.

^dBeing “out” refers to the extent the participant has disclosed to others that he is gay or homosexual.

^eDefined as two or more sex partners (male or female).

^fDefined as ever being “buzzed” or “high” on any substance during sex in the past 6 months.

Statistical Analyses

For each individual substance, we report the prevalence of lifetime use and the frequency of use during the past 6 months. Pearson chi-square tests were conducted to assess the association between three substance use outcome measures—frequent drug use, club drug use, polydrug use—with demographic characteristics, sexual orientation, degree of outness, venue attendance, and sexual behaviors.

Multivariate logistic regression was performed to identify significant ($p < .05$) predictors of each of three substance use outcomes. Variables with an alpha level of less than 0.25 in Pearson chi-square test were selected as entry candidates in multivariate logistic regression models. A backward stepwise procedure was then used to remove those variables with an adjusted statistical significance level greater than .20, following procedures described by Hosmer and Lemeshow (1989). Adjusted odds ratios and 95% confidence intervals were calculated and used to determine independent predictors of each of the three substance use outcomes. Finally, Wald chi-square statistics testing the global null hypothesis for each regression model are reported.

RESULTS

Participant Characteristics

Of 566 men who participated in the study, 496 reported male–male sex and only data from these men are analyzed here. The final sample (Table 1) was predominantly Filipino, Chinese, and Vietnamese. The mean age was 24. Most were foreign born, and half had graduated from college. A majority of the sample identified as gay, with over half stating they were out to more than half of the people they knew. The modal frequency of going to gay clubs was once a week. Sixty-four percent reported two or more sex partners during the past 6 months. Nearly half reported in the past 6 months having sex while under the influence of an illicit substance (any drug, excluding alcohol) and engaging in unprotected anal intercourse.

Club Drug Use

In bivariate analyses (Table 3), club drug use varied significantly by ethnicity and was more

common among men who were born in the United States, out to more than half the people they knew, frequently went to gay clubs, ever attended a circuit party, had multiple sex partners, had sex while under the influence of any illicit substance, and had unprotected anal sex. Multivariate analyses (Table 4) revealed that club drug use was significantly higher among Vietnamese and Korean compared to Chinese men, as well as among men who were 18–24 years old, frequently went to gay clubs, ever attended a circuit party, and had sex while under the influence of an illicit substance. A marginal association was found between club drug use and being out to most people.

Prevalence of Substance Use Behaviors

Table 2 shows that the majority of participants reported using alcohol, marijuana, and ecstasy in their lifetime, with over one fourth reporting use of speed/crystal, poppers, LSD, and Special K. Alcohol was the most commonly used substance during the past 6 months, followed by ecstasy, marijuana, speed/crystal, Special K, GHB, poppers, and LSD. During the past 6 months, 24% frequently used one or more illicit substances, 51% used a club drug, and 44% reported polydrug use.

Correlates and Multivariate Models of Substance Use Behaviors

Frequent Drug Use

In bivariate analyses (Table 3), we found that frequent drug use was more common among men who were born in the United States, less educated, out to more than half the people they knew, and ever had sex while under the influence of an illicit substance. Multivariate analyses (Table 4) revealed that frequent substance use was significantly correlated with not attending or completing college, being out to most people, and having sex while under the influence of an illicit substance.

Polydrug Use

In bivariate analyses (Table 3), polydrug use varied by ethnicity and was more common among men who were born in the United States, out to more

Table 4. Multivariate Models of Three Substance Use Outcomes—Frequent Drug Use, Club Drug Use, Polydrug Use (All Past 6 Months)

	Adjusted OR (95% CI)		
	Frequent drug use ^a	Club drug use ^b	Polydrug use ^c
Ethnicity			
Filipino	–	1.71 (0.999–2.97)	1.56 (0.88–2.75)
Chinese		1.00	1.00
Vietnamese		2.69 (1.38–5.19)	2.63 (1.35–5.11)
Thai		2.55 (0.81–8.01)	2.55 (0.80–8.14)
Japanese		2.25 (0.72–6.93)	2.21 (0.71–6.86)
Korean		5.69 (1.32–24.56)	5.42 (1.30–22.58)
Multi-ethnic		1.43 (0.67–3.07)	1.28 (0.58–2.84)
Other Asian		1.05 (0.46–2.44)	1.02 (0.44–2.38)
Other Pacific Islander		2.42 (0.12–47.52)	2.42 (0.11–51.13)
Age			
18–24	–	2.09 (1.35–3.23)	1.83 (1.15–2.92)
25–39		1.00	1.00
Birthplace			
U.S.-born	–	–	–
Foreign-born			
Education			
No college	2.95 (1.51–5.76)	–	–
Some college	2.56 (1.42–4.60)		
College graduate	1.00		
Degree of being “out” to others^d			
Less than half of people	1.00	1.00	–
More than half of people	2.27 (1.30–3.98)	1.53 (1.00–2.33)	
Frequency of clubbing, 6 months			
Once a month or less	–	1.00	1.00
More than once a month		2.26 (1.39–3.68)	2.28 (1.40–3.73)
Ever attended a circuit party			
Yes	–	2.23 (1.27–3.89)	2.30 (1.31–4.06)
No		1.00	1.00
Multiple sex partners, 6 months^e			
Yes	–	–	–
No			
Sex under the influence, 6 months^f			
Yes	3.21 (1.77–5.83)	3.78 (2.46–5.81)	3.58 (2.31–5.52)
No	1.00	1.00	1.00
Unprotected anal sex, 6 months			
Yes	–	–	–
No			
Wald chi-square (<i>p</i> value)	34.39 (.00)	94.97 (.00)	96.66 (.00)

Note. A backward stepwise procedure was used to remove those variables with an adjusted statistical significance level greater than .20.

^aDefined as weekly use or more of any illicit substance excluding alcohol; 365 observations included in the model.

^bDefined as any use of methylenedioxymethamphetamine (ecstasy), methamphetamines (speed), gamma-hydroxybutyrate (GBH), ketamine (special K), lysergic acid diethylamide (LSD); 491 observations included in the model.

^cDefined as using ≥ 3 drugs; 486 observations included in the model.

^dBeing “out” refers to the extent the participant has disclosed to others that he is gay or homosexual.

^eDefined as two or more sex partners (male or female).

^fDefined as ever being “buzzed” or “high” on any substance during sex in the past 6 months.

than half the people they knew, frequently went to gay clubs, ever attended a circuit party, had multiple sex partners, had sex while under the influence of an illicit substance, and had unprotected anal sex. Multivariate analyses (Table 4) revealed that polydrug

use was significantly higher among Vietnamese and Korean compared to Chinese men, as well as among men who were 18–24 years old, frequently went to gay clubs, ever attended a circuit party, and had sex while under the influence of an illicit substance.

DISCUSSION

These data offer a closer look at substance use among young API MSM in San Francisco. Findings indicate that API MSM who frequent venues such as gay neighborhoods, bars, and bookstores engage in high rates of substance use, particularly alcohol, marijuana, and ecstasy. Half of these men reported club drug use, nearly half reported polydrug use, and nearly one quarter reported weekly substance use during the past 6 months, and each of these behaviors was associated with sex while under the influence of substances. This API subgroup challenges the model minority view of APIs as a low-risk category for adverse health outcomes.

Prevalence of use for certain substances exceeded findings from other studies with mostly White MSM respondents in San Francisco. However, direct comparisons between our venue-based API MSM sample and probability samples used by Stall *et al.* (2001) and Greenwood *et al.* (2001) should be made with caution. Compared to findings from Stall *et al.* (2001), who reported on substance use prevalence in a probability sample of MSM in San Francisco, API MSM in our sample were more likely to report the use in the past 6 months of ecstasy (47% compared to 11%), LSD or other hallucinogens (14% compared to 6%), crystal or speed (20% compared to 13%), and other uppers (5% compared to 2%). Likewise, compared to Greenwood *et al.* (2001) who reported on young MSM in San Francisco, API MSM in our sample were more likely to report monthly or more frequent use of ecstasy (26.4% compared to 8%). In addition, 24% of API MSM reported frequent drug use compared to 21%, and 44% of API MSM reported polydrug use compared to 20% in Stall *et al.* (2001). Polydrug use prevalence was comparable to the 43% in Greenwood *et al.*'s (2001) sample of young MSM. It is also important to note that Stall *et al.* (2001) and Greenwood *et al.* (2001) were earlier studies, so prevalence of some drugs that have become more popular since then (e.g., crystal) would not be as high.

In comparison with other venue-based samples of young MSM, the API men described here appear to have comparable or slightly higher prevalence rates of substance use risk behaviors. Prevalence of club drugs in this sample was roughly equivalent to findings from the Young Men's Survey (52%), which was a multisite study of 15- to 22-year-old MSM recruited from sampled venues (Valleroy *et al.*, 2000). Further analysis of the Young Men's Study by Thiede

et al. (2003) found comparable or slightly lower rates of illicit drugs used during the prior 6 months, weekly drug use, and polydrug use. Stueve *et al.* (2002) found that less than one-third of participants were high during the last sexual episode with a non-main partner and nearly one-fifth were high during the last sexual episode with a main partner. Both estimates appear lower than the findings reported here. However, geographic differences in behavior may account for some of the differences between our San Francisco study compared to the multisite studies of Valleroy *et al.* (2000) and Thiede *et al.* (2003).

Most of the substances used at high prevalence rates in our API MSM sample belong to the club drug category. Indeed, 51% reported using club drugs during the past 6 months, corroborating prior qualitative findings by Nemoto *et al.* (2003) indicating that many young API MSM view club drug use as normative among young gay men. Reback (1997) has also described the cultural pervasiveness of club drug use among young gay men in Los Angeles. It is evident that young API MSM in San Francisco are similarly impacted by the surge in club drug use described in other reports (Koesters *et al.*, 2002; NIDA, 2000; Ross *et al.*, 2003).

Multivariate models revealed some common demographic correlates for each substance use outcome as well as unique correlates. Frequent drug use was correlated with not completing college and being out to more than half the people they knew. Club drug use was associated with specific ethnic groups (Vietnamese and Korean compared to Chinese men), being 18–24 years old, going to clubs more than once a month, ever attending a circuit party, and, marginally, with degree of being out to others. Polydrug use was similar to club drug use in being associated with Vietnamese and Korean ethnicity, age, frequency of going to clubs, and ever attending a circuit party (associations with Korean ethnicity must be interpreted with caution because of wide confidence intervals and small sample size). As attendance at gay clubs and circuit parties appeared uniquely associated with club- and polydrug use, these venues can be important areas for conducting substance use outreach intervention to high-risk API MSM (Colfax *et al.*, 2001; Mattison *et al.*, 2001).

Frequent substance use, club drug use, and polydrug use were each associated with over a threefold increased likelihood of sex while under the influence of substances. This is a compelling pattern of findings given the growing body of research showing substance use operates as a co-factor in risk for

HIV transmission (Ostrow, 2000; Ross and Williams, 2001; Stall and Purcell, 2000). Prior research has hypothesized four potential explanations of the association between substance use and high-risk sexual activity among MSM (Chesney *et al.*, 1998; Ross & Williams, 2001). First, physiological responses to illicit substances may act as an aphrodisiac that leads to increased sexual desires. Second, illicit substances may uninhibit controlled sexual urges. Third, environmental and contextual factors associated with drug use might increase the chance of high-risk sexual behavior (e.g., the sexually charged atmosphere of gay clubs or circuit parties where club drug use co-occurs). Fourth, a third variable, such as having a risk-taking personality, might explain both substance use and sexual behaviors. All four explanations might contribute to the association between substance use and sexual risk-taking observed in the present study. Our cross-sectional data do not allow for interpretation of any causal or temporal associations between substance use and sexual behavior. Further research is needed to explore the influence of substance use on sexual behavior of young API MSM outside of San Francisco, as data from this San Francisco-based sample might not reflect phenomena in other cities. Intervention programs that address the association between substance use and sexual behavior among API MSM in San Francisco are warranted, as these data clearly show that the two risk factors co-occur at high rates.

It is important to consider further the limitations of the present study. First, the use of venue-based sampling limits generalizability of findings. Because of the use of venue-based sampling methods for accessing this hard-to-reach population, the respondents in this study might not represent API MSM who do not frequent gay venues such as bars, bookstores, clubs, and gay community spaces. Substance use prevalence rates might differ in a population-based sample of API MSM. Second, because nearly 4 of 10 identified eligibles chose not to participate, our findings may be subject to nonparticipation biases. Although no demographic differences emerged among those who were screened and chose to participate versus those who were screened yet chose not to participate, there may have been nonobserved differences in patterns of substance use and sexual risk behavior; for example, men who engage in the highest risk substance use and sexual risk behaviors might have systematically opted out of participating. Furthermore, there may have been nonrecorded differences between those who agreed to be screened

and those who did not agree to be screened. Third, because patterns of drug use change with time, the data presented here (collected during years 2000 and 2001) might not reflect current patterns. Fourth, our research was limited in our ability to interview only English-speaking API men, thereby precluding monolingual men and, potentially, less acculturated API men from participation. Fifth, it is difficult to interpret ethnic group differences obtained, particularly in light of the wide confidence intervals (perhaps due to small Korean sample size). Furthermore, ethnicity often reflects macro-level factors that were not measured here such as community norms, socioeconomic status, migration history, housing and accommodation, and acculturation level. Indeed, these factors may introduce important sources of heterogeneity between and within API ethnic groups in San Francisco, and future research should consider their implications for health risk behaviors (e.g., Srinivasan & Guillermo, 2000). However such considerations reach beyond the scope of analysis here.

Our study clearly demonstrates that young API MSM do not conform to a stereotype of model minorities who are protected from substance use and health risks such as HIV. Because of the view that health vulnerabilities for APIs are generally less severe than other minority groups, it is likely that this group remains overlooked by general (non-API-specific) substance use programs and HIV prevention outreach specialists. Substance use prevention and outreach intervention efforts should target MSM-themed venues where young API men congregate, and educational programs should address linkages between substance use and unprotected sex. Prevalence of substance use, particularly club drugs, points to the need for more in-depth research on the motivations, social context, and personal meanings associated with using substances among young API MSM, as well as for culturally sensitive substance use prevention programs to respond to this epidemic. However, there remain few high-quality interventions for this group. The only known evidence-based HIV prevention intervention for API MSM (Choi *et al.*, 1996) does not include substance use as a primary focus, and substance use prevention programs for this community tend not to be driven by sufficient research and generally lack appropriate resources for addressing issues associated with sexuality, ethnicity, and sexual risk (Chow, 2002). Further practical steps based on this data can include training substance use providers on cultural issues and diversity among

API populations, educating HIV outreach specialists who target API communities on co-occurring substance use risk factors, and targeting outreach at public spaces where high-risk activity is known to occur such as gay clubs, API social venues, and circuit parties. Next steps in developing culturally sensitive prevention interventions for this group should include ethnographic studies to understand the life contexts among API MSM who use substances, epidemiological studies with API MSM in other geographic settings to clarify whether the observed patterns generalize to other cities or reflect site-specific processes, and community-collaborative endeavors to involve stakeholders and community members in the effort to reduce substance use and HIV risk among API MSM. It will be important for this growing body of research to build theoretical frameworks that can address how social and cultural processes contribute to public health outcomes such as substance use and sexual risk, and which should be tested in controlled health intervention trials.

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REFERENCES

- Bachman, J. G., Wallace, J. M., O'Malley, P. M., Johnston, L. D., Kurth, C. L., & Neighbors, H. W. (1991). Racial/ethnic differences in smoking, drinking, and illicit drug use among American high school seniors 1976-1989. *American Journal of Public Health, 81*, 372-377.
- Chen, M. S., & Hawks, B. L. (1995). A debunking of the myth of healthy Asian American and Pacific Islanders. *American Journal of Health Promotion, 9*, 261-268.
- Chesney, M. A., Barrett, D. C., & Stall, R. (1998). Histories of substance use and risk behavior: Precursors to HIV seroconversion in homosexual men. *American Journal of Public Health, 88*, 113-116.
- Choi, K., Coates, T. J., Catania, J. A., Lew, S., & Chow, P. (1995). High HIV risk among gay Asian and Pacific Islander men in SF. *AIDS, 9*, 306-308.
- Choi, K., Kume-kawa, E., Dang, Q., Kegeles, S. M., Hays, R. B., & Stall, R. (1999). Risk and protective factors affecting sexual behavior among young Asian and Pacific Islander men who have sex with men: Implications for HIV prevention. *Journal of Sex Education and Therapy, 24*, 47-55.
- Choi, K. H., Lew, S., Vittinghoff, E., Catania, J. A., Barrett, D. C., & Coates, T. J. (1996). The efficacy of brief group counseling in HIV risk reduction among homosexual Asian and Pacific Islander men. *AIDS, 10*, 81-87.
- Choi, K. H., McFarland, W., Neilands, T. B., Nguyen, S., Louie, B., Secura, G. M., Behel, S., MacKellar, D., & Valleroy, L. (2004). An opportunity for prevention: Prevalence, incidence, and sexual risk for HIV among young Asian and Pacific Islander men who have sex with men, San Francisco. *Sexually Transmitted Diseases, 31*, 475-480.
- Chow, J. (2002). Asian American and Pacific Islander mental health and substance abuse agencies. *Administration and Policy in Mental Health, 30*, 79-86.
- Colfax, G. N., Mansergh, G., Guzman, R., Vittinghoff, E., Marks, G., Rader, M., & Buchbinder, S. (2001). Drug use and sexual risk behavior among gay and bisexual men who attend circuit parties: A venue-based comparison. *Journal of Acquired Immune Deficiency Syndromes, 28*, 373-379.
- Crosby, G. M., Stall, R. D., Paul, J. P., & Barrett, D. C. (1998). Alcohol and drug use patterns have declined between generations of younger gay-bisexual men in San Francisco. *Drug and Alcohol Dependence, 52*, 177-182.
- Ellickson, P. L., & Morton, S. C. (1999). Identifying adolescents at risk for hard drug use: Racial/ethnic variations. *Journal of Adolescent Health, 25*, 382-395.
- Greenwood, G. L., White, E. W., Page-Shafer, K., Bein, E., Osmond, D. H., Paul, J., & Stall, R. D. (2001). Correlates of heavy substance use among young gay and bisexual men: The San Francisco Young Men's Health Study. *Drug and Alcohol Dependence, 61*, 105-112.
- Harachi, T. W., Catalano, R. F., Kim, S., & Choi, Y. (2001). Etiology and prevention of substance use among Asian American youth. *Prevention Science, 2*, 57-65.
- Hosmer, D. W., & Lemeshow, S. (1989). *Applied logistic regression*. New York: Wiley.
- Klinge, R. (2000). *Substance use, intervention needs, and risk and protective factor profiles among Native Hawaiian, Filipino, Japanese, Chinese and Caucasian Adolescents in Hawaii*. Paper presented at the annual meeting of the American Public Health Association, Boston, MA.
- Koesters, S. C., Rogers, P. D., & Rajasingham, C. R. (2002). MDMA ('ecstasy') and other 'club drugs': The new epidemic. *Pediatric Clinics of North America, 49*, 415-433.
- MacKellar, D., Valleroy, L., Karon, J., Lemp, G., & Janssen, R. (1996). The Young Men's Survey: Methods for estimating HIV seroprevalence and risk factors among young men who have sex with men. *Public Health Reports, 111*, 138-144.
- Maddahian, E., Newcomb, M. D., & Bentler, P. M. (1985). Single and multiple patterns of adolescent substance use: Longitudinal comparisons of four ethnic groups. *Journal of Drug Education, 15*, 311-326.
- Mattison, A. M., Ross, M. W., Wolfson, T., Franklin, D., & HNRC Group (2001). Circuit party attendance, club drug use, and unsafe sex in gay men. *Journal of Substance Abuse, 13*, 119-126.
- National Asian Pacific American Families Against Substance Abuse (2001). *Asian American Pacific Islander Substance Abuse Needs Assessment Project*. Report conducted by NAPAFASA, Los Angeles, CA.
- National Institute on Drug Abuse (2000). *NIDA notes: Research on club drugs*. Washington, DC: National Institute on Drug Abuse, Community Research Branch.
- Nemoto, T., Aoki, B., Huang, K., Morris, A., Nguyen, H., & Wong, W. (1999). Drug use behaviors among Asian drug users in San Francisco. *Addictive Behaviors, 24*, 823-838.
- Nemoto, T., Operario, D., & Soma, T. (2002). Risk behaviors of Filipino methamphetamine users in San Francisco: Implications for prevention and treatment of drug use and HIV. *Public Health Reports, 117*, S30-S38.
- Nemoto, T., Operario, D., Soma, T., Bao, D., Vajrabukka, A., & Crisostomo, V. (2003). HIV risk and prevention among

- Asian/Pacific Islander men who have sex with men: Listen to our stories. *AIDS Education and Prevention*, 15, 7–20.
- Oetting, E. R., Deffenbacher, J. L., Taylor, M. J., Luther, N., Beauvais, F., & Edwards, R. W. (2000). Methamphetamine use by high school students: Recent trends, gender and ethnicity differences, and use of other drugs. *Journal of Child and Adolescent Substance Abuse*, 10, 33–50.
- Ostrow, D. G. (2000). The role of drugs in the sexual lives of men who have sex with men: Continuing barriers to researching this question. *AIDS and Behavior*, 4, 205–219.
- Price, R. K., Risk, N. K., Wong, M. M., & Kung'le, R. S. (2002). Substance use and abuse by Asian Americans and Pacific Islanders: Preliminary results from four national epidemiologic studies. *Public Health Reports*, 117, S39–S50.
- Reback, C. J. (1997). *The social construction of a gay drug: Methamphetamine use among gay and bisexual males in Los Angeles*. Report commissioned by the City of Los Angeles, AIDS Coordinator.
- Ross, M. W., Mattison, A. M., & Franklin, D. R. (2003). Club drugs and sex on drugs are associated with different motivations for gay circuit party attendance in men. *Substance Use and Misuse*, 38, 1173–1183.
- Ross, M. W., & Williams, M. L. (2001). Sexual behavior and illicit drug use. *Annual Review of Sex Research*, 12, 290–310.
- Srinivasan, S., & Guillermo, T. (2000). Toward improved health: Disaggregating Asian American and Native Hawaiian/Pacific Islander data. *American Journal of Public Health*, 90, 1731–1734.
- Stall, R., Paul, J. P., Greenwood, G., Pollack, L. M., Bein, E., Crosby, G. M., Mills, T. C., Binson, D., Coates, T. J., & Catania, J. A. (2001). Alcohol use, drug use and alcohol-related problems among men who have sex with men: The Urban Men's Health Study. *Addiction*, 96, 1589–1601.
- Stall, R., & Purcell, D. W. (2000). Intertwining epidemics: A review of research on substance use among men who have sex with men and its connection to the AIDS epidemic. *AIDS and Behavior*, 4, 181–192.
- Stueve, A., O'Donnell, L., Duran, R., San Doval, A., Geier, J., & the Community Intervention Trial for Youth Study Team (2002). Being high and taking sexual risks: Findings from a multisite survey of urban young men who have sex with men. *AIDS Education and Prevention*, 14, 482–495.
- Substance Abuse and Mental Health Services Administration (2002). *Results from the 2001 National Household Survey on Drug Abuse: Volumes 1 & 2, Summary of National Findings*. Rockville, MD: Office of Applied Studies.
- Thiede, H., Valleroy, L. A., MacKellar, D. A., Celentano, D. D., Ford, W. L., Hagan, H., Koblin, B. A., LaLota, M., McFarland, W., Shehan, D. A., Torian, L. V., & Young Men's Survey Study Group (2003). Regional patterns and correlates of substance use among young men who have sex with men in 7 US urban areas. *American Journal of Public Health*, 93, 1915–1921.
- Tong, T., & Boyer, E. W. (2002). Club drugs, smart drugs, raves, and circuit parties: An overview of the club scene. *Pediatric Emergency Care*, 18, 216–218.
- Valleroy, L. A., MacKellar, D. A., Karon, J. M., Rosen, D. H., McFarland, W., Shehan, D. A., Stoyanoff, S. R., LaLota, M., Celentano, D. D., Koblin, B. A., Thiede, H., Katz, M. H., Torian, L. V., Janssen, R. S., & the Young Men's Study Group (2000). HIV prevalence and associated risks in young men who have sex with men. *JAMA*, 284, 198–204.
- Wong, M., & Austin, G. (2000). *Alcohol and other drug use among adolescent Asian Americans and Pacific Islanders in California*. Paper presented at the annual meeting of the American Public Health Association, Boston, MA.
- Woody, G. E., Donnell, D., Seage, G. R., Metzger, D., Marmor, M., Koblin, B. A., Buchbinder, S., Gross, M., Stone, B., & Judson, F. N. (1999). Non-injection substance use correlates with risky sex among men having sex with men: Data from HIVNET. *Drug and Alcohol Dependence*, 53, 197–205.
- Zane, N., & Kim, J. H. (1994). Substance use and abuse. In N. Zane, D. T. Takeuchi, & K. Young (Eds.), *Confronting critical health issues of Asian and Pacific Islander Americans* (pp. 316–343). San Francisco, CA: Sage.