

Drug use and risk behaviour among regular ecstasy users: Does sexuality make a difference?

LOUISA DEGENHARDT

National Drug and Alcohol Research Centre, University of New South Wales, Sydney, Australia

Abstract

This study aimed to compare homo/bisexual men and women with their heterosexual counterparts who were regular ecstasy users, to consider whether patterns of drug use or risk differed across these groups. Respondents ($n=852$ ecstasy users) were recruited via advertisements in entertainment street press, gay and lesbian newspapers, music and clothing stores and at university campuses. Interviewer contacts and 'snowball' sampling were also utilized. In total, 23% of females in the sample self-identified as lesbian or bisexual and 13% of males interviewed self-identified as homo/bisexual. Rates of use of 'newer' drugs on the dance scene—crystal methamphetamine and ketamine—were higher among homo/bisexual men and women. Self-reported risk behaviours such as unprotected sex and needle sharing (among those who had injected drugs) did not differ according to sexuality. However, homo/bisexual men and women were significantly more likely than heterosexual men and women to report a greater number of sexual partners and higher rates of injecting drug use. These findings suggest that among a group of people who were selected because they were regularly involved in the party drug market, initiatives designed to reduce harms related to injecting and sex risk may be needed for a greater proportion of homo/bisexual males and females who are involved in the dance/nightclub scene.

Résumé

Cette étude visait à comparer des hommes et des femmes homo/bisexual(le)s consommant régulièrement de l'ecstasy, à leurs homologues hétérosexuel(le)s, afin de vérifier si les modèles d'usage de drogues ou de prise de risques diffèrent selon les groupes. Les répondants ($n=852$) ont été recrutés par annonces dans la presse de loisirs, les journaux gays et lesbiens, les boutiques de disques et de vêtements, et sur les campus universitaires. Les connaissances personnelles des enquêteurs et un échantillonnage « en boule de neige » ont également été utilisés. Au total, se sont identifié(e)s comme lesbiennes ou bisexuelles, 23% des femmes, et comme homo/bisexuels, 13% des hommes. Les taux d'usage des « dernières drogues » sur la scène récréative – cristaux de métamphétamine et kétamine – étaient plus élevés chez les hommes et les femmes homo/bisexual(le)s. Les comportements à risques auto-déclarés, tels que les rapports sexuels non protégés et le partage de seringues (pour ceux qui consommaient des drogues injectables) ne varient pas selon l'orientation sexuelle. Cependant, les hommes et les femmes homo/bisexual(le)s sont significativement plus susceptibles de déclarer un nombre plus élevé de partenaires sexuels ou des taux plus élevés d'usage de drogues injectables que les hommes et les femmes hétérosexuel(le)s. Ces résultats suggèrent que dans un groupe de personnes qui seraient sélectionnées en raison de leur implication dans le marché des drogues récréatives, des initiatives de réduction des risques liés à l'injection de drogues ou aux rapports sexuels peuvent être

Correspondence: Louisa Degenhardt, National Drug and Alcohol Research Centre, University of New South Wales, Sydney, New South Wales 2052, Australia. Email: l.degenhardt@unsw.edu.au

nécessaires pour la plus forte proportion d'hommes et de femmes homo/bisexuel(le)s évoluant sur la scène récréative et prenant ces risques.

Resumen

El objetivo de este estudio es comparar la conducta de hombres y mujeres homosexuales y bisexuales con sus homólogos heterosexuales que son usuarios regulares de éxtasis para poder analizar si existen diferencias en el modo en que ambos grupos se comportan con respecto al uso de estupefacientes o los riesgos que corren. Los entrevistados (n=852 usuarios de éxtasis) fueron captados a través de anuncios en prensa de entretenimiento, revistas para gays y lesbianas, tiendas de música y ropa y en campus universitarios. También se utilizaron contactos de entrevistadores y un muestreo de tipo "bola de nieve". En total, 23% de las mujeres en el muestreo se identificaron como lesbianas o bisexuales y el 13% de los hombres entrevistados se calificaron de homo/bisexuales. El porcentaje de uso de las drogas "más nuevas" en los ambientes de baile – metanfetamina cristal y ketamina – era más alto entre los hombres y mujeres homo/bisexuales. Las conductas de riesgos informadas por los mismos entrevistados, tales como relaciones sexuales sin protección y compartir jeringuillas (entre los que se habían inyectado drogas) no se diferenciaban en función de la sexualidad. Sin embargo, los hombres y mujeres homo/bisexuales presentaban significativamente más probabilidades que los hombres y mujeres heterosexuales a informar de un mayor número de compañeros sexuales y tasas mayores del uso de drogas mediante inyección. Estos resultados indican que para un grupo de personas que fueron seleccionadas por su participación regular en el mercado de las drogas que se suministran en fiestas, podrían ser necesarias iniciativas con el fin de reducir los daños relacionados con las inyecciones y el riesgo sexual para un mayor porcentaje de hombres y mujeres homo/bisexuales que participan en ambientes de bailes/discotecas.

Keywords: *Ecstasy, young people, drug use, sexual risk behaviour*

Introduction

Research examining drug use among persons identifying as gay, lesbian or bisexual has increased over past decades. Research that has focused on the prevalence of drug use and drug use disorders has typically found that rates of drug use are higher among homosexually active men and women than their heterosexual counterparts in the general community (Burgard *et al.* 2005, Cochran *et al.* 2004, Ryan *et al.* 2001, Gilman *et al.* 2001, Hillier *et al.* 2003). In a sample of Australian women recruited on a representative, random basis from the general population (no such study exists for males), a study of lesbian/bisexual women compared to their heterosexual counterparts (no similar study exists for males), lesbian or bisexual women were 4.7 times more likely to report having used cannabis in the past year and 5.5 times more likely to report using other illicit drugs; they were also 12.3 times more likely to report having injected drugs at some point (Hillier *et al.* 2003).

It has been suggested that elevated rates of drug use may reflect a certain normalisation of use among homo/bisexual communities (Parks 1999, Hughes and Eliason 2002). There has also been discussion of the lower likelihood of traditional 'marriage' relationships (Cochran 2001), with the assumption that marriage and child-bearing are associated with a reduction in leisure activities (Hess 1995). A lower likelihood of assuming such roles may conversely mean that a range of leisure activities (including drug use) are more likely to occur. Given the social stigmatisation and/or marginalisation that may occur for homosexually active men and women, it has also been suggested that higher rates of drug use reflect a mechanism to cope with these stressors (Cochran 2001). Finally, it is also possible that the higher rates reflect the relative importance of bars and nightclubs as a key point of socialisation for homosexually active men and women (Cochran 2001). There is good evidence to suggest that rates of drug use (both licit and illicit) are high among some

subpopulations of the gay community. Homosexually active men who live in urban areas and who attend gay bars, dance parties, and 'circuit parties', have high rates of illicit drug use (Lee *et al.* 2003, Mansergh *et al.* 2001, Thiede *et al.* 2003, Halkitis *et al.* 2001).

Other research has examined rates of drug use and risk behaviours among selected samples of homo/bisexual men and lesbian/bisexual women. For homo/bisexual men, this research seems to have been driven by understandable concern about documented associations between drug use and reported HIV risk behaviours (Gonzales *et al.* 1999, Colfax *et al.* 2001, 2004, Chesney *et al.* 1998, Frosch *et al.* 1996, Halkitis *et al.* 2001, Semple *et al.* 2004, Reback and Grella 1999, Anonymous 2004). This research has revealed that homo/bisexual men who live in urban areas and who attend gay bars, dance parties, and 'circuit parties', frequently have high rates of illicit drug use (Lee *et al.* 2003, Mansergh *et al.* 2001, Thiede *et al.* 2003) and that HIV risk behaviours are higher among those who use drugs (Anderson and Flynn 1997, Chesney *et al.* 1998, Gonzales *et al.* 1999, Halkitis *et al.* 2001, Richters *et al.* 2002). Convenience samples of lesbian/bisexual women recruited from similar venues have also found high rates of drug use (Richters *et al.* 2002), and of heavy drug and alcohol use (Parks 1999).

Anecdotally, it has been suggested that the homo/bisexual community may often be one community where emerging drug types are first used, with the use of such newer drugs increasing among heterosexual communities at a later date. Such suggestions are yet to be examined formally. Furthermore, it is unclear whether there is a tendency for the *frequency* of drug use to differ among homosexual party drug users compared to their heterosexual counterparts, despite frequent assertions (particularly in the media) that the gay community tends to involve heavier or more hedonistic patterns of drug use.

Among homosexually active men, considerable research has investigated associations between drug use and risk behaviours, particularly with respect to behaviours increasing the risk of HIV transmission, such as unprotected anal intercourse (UAIC) (Rusch *et al.* 2004, Halkitis *et al.* 2001, Colfax *et al.* 2001). This research seems to have been driven by understandable concern about documented associations between drug use and HIV risk behaviours (Rawstorne and Worth 2004, Smith *et al.* 2004, Slavin 2004, Gonzales *et al.* 1999, Colfax *et al.* 2001, Colfax *et al.* 2004, Chesney *et al.* 1998, Frosch *et al.* 1996, Halkitis *et al.* 2001, Semple *et al.* 2004, Reback and Grella 1999, Anonymous 2004, Anderson and Flynn 1997, Richters *et al.* 2002). The concomitant association with HIV infection has also received considerable discussion and debate (Rawstorne and Worth 2004, Smith *et al.* 2004, Slavin 2004, Boddiger 2005, Urbina and Jones 2004, Halkitis *et al.* 2001, Colfax *et al.* 2001).

In recent years, there have been many reports of increases in rates of sex risk behaviours among homosexually active men, in Europe, Canada, the USA as well as Australia (Van de Ven *et al.* 2002, Elford and Hart 2005). This trend has been accompanied by an increase in a range of sexually transmitted infections such as chlamydia and gonorrhoea in Australia (Degenhardt *et al.* 2005, Jin *et al.* 2005). Such trends point to the need to identify and address factors that may be related to such risks.

The current paper aims to examine whether sexuality is related to particular patterns of drug use and risk behaviours among a sample of regular ecstasy users. This question is important because it may provide information about whether tailored programmes and interventions are required for different subgroups of drug users in the community. More specific objectives include: (i) examining whether sexuality is a marker of drug use or risk behaviours among a sample of persons affiliated with the dance party/night club scene; (ii) examining the prevalence and patterns of drug use and drug problems according to sexuality; (iii) examining self-reported drug and sex risk behaviours across the groups; and

(iv) considering whether responses to such drug use or risk need to be targeted in different ways for different groups within the dance scene. The study makes use of data collected from regular ecstasy users around Australia as part of the Party Drugs Initiative (PDI). Users of ecstasy and other party drugs almost universally report that they use them in nightclubs, dance parties, pubs, raves and similar events (Breen *et al.* 2004).

Methods

The sample recruited for this study was interviewed as part of the Australian Party Drugs Initiative (PDI), which was trialled in all Australian jurisdictions in 2003 and 2004 (Breen *et al.* 2004, Topp *et al.* 2004, Breen *et al.* 2002). The PDI is designed to monitor trends in the markets for ecstasy and other party drugs: it comprises face-to-face interviews with current regular ecstasy users recruited in each capital city across Australia; face-to-face and telephone interviews with key experts who, through the nature of their work, have regular contact with ecstasy users; and the analysis of indicator data sources such as drug seizures, arrests and treatment episodes (Breen *et al.* 2004). These three data sources are triangulated against one another to provide an indication of emerging trends in drug use and party drug markets.

The sample for the present study was recruited using a purposive sampling strategy (Kerlinger 1986), which included advertisements in entertainment street press, gay and lesbian newspapers, music and clothing stores and at university campuses. Interviewer contacts and snowball procedures (Biernacki and Waldorf 1981) were also utilised. Snowballing is a means of sampling 'hidden' populations which relies on peer referral, and is widely used to access illicit drug users both in Australian (Boys *et al.* 1997, Ovendon and Loxley 1996, Solowij *et al.* 1992) and international (Solowij *et al.* 1992, Dalgarno and Shewan 1996, Forsyth 1996, Peters *et al.* 1997) studies. On completion of the interview, participants were invited to mention the study with friends who might be willing and able to participate.

Participants contacted the researchers by telephone and were screened for eligibility. To meet entry criteria, they had to be at least 17 years of age (due to ethical constraints), have used ecstasy at least six times during the preceding six months, and have been a resident of the capital city in which the interview took place for the past year. Ethics approval was obtained from the University of New South Wales, Sydney.

All information provided was confidential and anonymous, and the study involved a face-to-face interview that took approximately 45 minutes. All respondents were volunteers who were reimbursed AU\$30 for their participation. Interviews took place in varied locations, negotiated with participants, including the research institutions, coffee shops or parks, and were conducted by interviewers trained in the administration of the interview schedule. The nature and purpose of the study was explained to participants before informed consent was obtained.

Interview schedule

Participants were administered a structured interview schedule based on a national study of ecstasy users conducted by the National Drug and Alcohol Research Centre (NDARC) in 1997 (Topp *et al.* 1998, Topp *et al.* 2000), which incorporated items from a number of previous NDARC studies of amphetamine users (Solowij *et al.* 1992, Darke, Cohenn *et al.* 1994, Hando and Hall 1993, Hando *et al.* 1997). The interview focused primarily on the preceding six months, and assessed demographic characteristics; patterns of ecstasy and

other drug use, including frequency and quantity of use and routes of administration; the price, purity and availability of different party drugs; self-reported criminal activity; drug-related problems, including relationship, financial, legal and occupational problems; and general trends in party drug markets, such as new drug types, new drug users and perceptions of police activity.

All participants were asked: 'How would you describe your sexuality?'. Persons nominated their sexual identification, which was coded according to a number of categorical responses.

Results

A total of 852 regular ecstasy users were recruited. In total, 23% of females in the sample self-identified as lesbian or bisexual (33% lesbian, 67% bisexual); and 13% of males interviewed self-identified as homo/bisexual (52% gay, 48% bisexual). No participants identified as being transgender.

There were some demographic differences between the groups (Table 1). Homo/bisexual men and women were significantly older than their heterosexual counterparts (Table 1). Lesbian/bisexual females (LBF) were significantly more likely than heterosexual females (HF) to identify as being of Aboriginal or Torres Strait Islander (ATSI) background (12% vs. 2%), and to report being unemployed (17% vs. 8%; Table 1). Homo/bisexual men (HBM) were more likely to report having postsecondary qualifications than heterosexual men (HM). There were no differences between groups in the likelihood of having a prison or drug treatment history.

Drug use

Females. There were a number of differences between heterosexual and lesbian/bisexual women in recent drug use. Similar rates of use of drugs such as cannabis, alcohol, tobacco, methamphetamine powder ('speed'),¹ cocaine and MDA were reported by both groups of females. However, there were a large number of drugs for which lesbian/bisexual women reported higher rates of use in the past six months: ketamine (OR 2.00; 95%CI: 1.11, 3.59), base methamphetamine ('base') (OR 1.77; 95%CI: 1.05, 3.00), crystal meth (OR 1.64; 95%CI: 1.00, 2.75), amyl nitrite (OR 2.76; 95%CI: 1.55, 4.90), heroin (OR 6.56; 95%CI: 2.48, 17.35), other opiates (OR 4.52; 95%CI: 2.04, 10.00), antidepressants (OR 2.62; 95%CI: 1.33, 5.16), and benzodiazepines (OR 3.56; 95%CI: 2.08, 6.07).

In short, lesbian/bisexual women reported higher rates of use of a range of pharmaceutical drugs, as well as a range of drugs that have become more prevalent in the party drug use scene only in recent years in Australia. Overall, however, it did *not* appear that the frequency of use (in terms of days used in the past six months) differed markedly between users of these drugs across the groups. As can be seen in Table 2, the median days' use of all drug types was similar for both groups with the exception of more frequent antidepressant (180 days LBF vs. 28 days HF, $p < .001$) and cannabis use (44 days LBF vs. 17 days HF, $p < .01$) among lesbian/bisexual women who reported using these drugs.²

Males. There was a more mixed pattern of results for males (Table 2). Homo/bisexual males were more likely than heterosexual males to report recent ketamine use (OR 1.97;

Table 1. Demographic characteristics of ecstasy users by self-identified sexuality.

	Heterosexual Females (HF) N=252	Lesbian/bisexual Females (L/BF) N=76	OR (95%CI)	Heterosexual Males (HM) N=455	Homo/bisexual Males (H/BM) N=69	OR (95%CI)
% gay/lesbian		33			52	
% bisexual		67			48	
Age (Median)	22	26	$U=6285, p<.001$	23	25	$U=11447, p<.001$
% ATSI	1.6	11.8	8.33 (2.49, 27.88)	4.4	4.3	n.s.
Years education (Median)	12	12	n.s.	12	12	n.s.
% postsecondary qualifications	47	59	n.s.	47	71	2.62 (1.52, 4.52)
% unemployed	7.9	17.1	2.39 (1.13, 5.08)	17.8	27.5	n.s.
% prison history	2.8	4	n.s.	9.9	8.8	n.s.
% currently in drug treatment	2.4	5.3	n.s.	2.2	2.9	n.s.

Table 2. Drug use history of ecstasy users by self-identified sexuality.

	% 6 months use		Median days use (range) ¹		% 6 months use		Median days use (range) ¹		% 6 months use		Median days use (range) ¹	
	HF	LBF	HF	LBF	HF	LBF	HF	LBF	HF	LBF	HF	LBF
Ecstasy	100	100	15 (6-90)	20 (6-96)	100	100	15 (6-120)	24 (6-180)*	100	100	15 (6-120)	24 (6-180)*
Cannabis	73.8	76.3	17 (1-180)	44 (2-180)**	86.6	86.6	72 (1-180)	71 (1-180)	78.3	78.3	72 (1-180)	71 (1-180)
Alcohol	93.3	89.5	40 (1-180)	48 (2-180)	95.6	95.6	48 (1-180)	48 (1-180)	97.1	97.1	48 (1-180)	48 (1-180)
Tobacco	70.6	73.7	90 (1-180)	180 (1-180)	75.6	75.6	150 (1-180)	180 (1-180)	79.7	79.7	150 (1-180)	180 (1-180)
Meth powder ("speed")	70.6	60.5	6 (1-96)	9 (1-180)	67.7	67.7	4 (1-180)	6 (1-180)	65.2	65.2	4 (1-180)	6 (1-180)
Base methamphetamine	31.3	44.7*	6 (1-180)	7 (1-180)	41.1	41.1	4.5 (1-180)	6 (1-180)	40.6	40.6	4.5 (1-180)	6 (1-180)
Crystal methamphetamine	41.7	53.9*	6 (1-96)	8 (1-180)	41.8	41.8	4 (1-180)	4.5 (1-180)	63.8***	63.8***	4 (1-180)	4.5 (1-180)
Cocaine	28.6	36.8	2 (1-48)	2 (1-10)	26.4	26.4	2 (1-180)	3 (1-48)	18.8	18.8	2 (1-180)	3 (1-48)
Ketamine	17.9	30.3**	2 (1-14)	3 (1-30)	22.4	22.4	3 (1-96)	4 (1-24)	36.2**	36.2**	3 (1-96)	4 (1-24)
MDA	14.7	15.8	2 (1-15)	1 (1-23)	14.9	14.9	2 (1-24)	1 (1-100)	20.3	20.3	2 (1-24)	1 (1-100)
GHB	7.5	7.9	4 (1-78)	1.5 (1-5)	11.0	11.0	1.5 (1-72)	2 (1-24)	15.9	15.9	1.5 (1-72)	2 (1-24)
LSD	19.0	21.1	2 (1-48)	4 (1-48)	31.9	31.9	2 (1-50)	1.5 (1-15)	11.6**	11.6**	2 (1-50)	1.5 (1-15)
Nitrous oxide	25.0	18.4	6 (1-72)	4 (1-96)	31.9	31.9	3 (1-100)	10 (1-90)	13.0**	13.0**	3 (1-100)	10 (1-90)
Amyl nitrate	16.7	35.5***	2 (1-50)	5 (1-40)	14.6	14.6	2 (1-50)	4 (1-120)*	49.3***	49.3***	2 (1-50)	4 (1-120)*
Heroin	2.8	15.8***	5 (2-20)	6 (1-180)	5.7	5.7	15 (1-180)	17.5 (1-144)	8.7	8.7	15 (1-180)	17.5 (1-144)
Other opiates	5.2	19.7***	12 (1-180)	10 (1-180)***	10.5	10.5	4.5 (1-180)	10 (1-24)	13.0	13.0	4.5 (1-180)	10 (1-24)
Antidepressants	9.9	22.4**	28 (1-180)	180 (1-180)***	8.4	8.4	40 (1-180)	105 (2-180)	5.8	5.8	40 (1-180)	105 (2-180)
Benzodiazepines	23.8	52.6***	6 (1-180)	6 (1-180)	23.7	23.7	4.5 (1-180)	37 (1-180)***	36.2*	36.2*	4.5 (1-180)	37 (1-180)***

Notes: * $p < .05$. ** $p < .01$ *** $p < .001$. ¹Days of use among those reporting that they had used the drug. 180 days indicates daily use in the past 6 months.

95%CI 1.15, 3.37), crystal meth use (OR 2.46; 95%CI: 1.45, 4.15), amyl nitrite use (OR 5.25; 95%CI: 3.08, 8.98), and benzodiazepine use (OR 1.83; 95%CI: 1.07, 3.12). In contrast, males identifying as heterosexual were more likely to report recent LSD (OR 3.57; 95%CI: 1.66, 7.63) and nitrous oxide use (OR 3.12; 95%CI: 1.51, 6.45).

The median frequency of use was typically similar for most drug types among those reporting use. However, homo/bisexual males reported significantly more frequent ecstasy use in the past 6 months (24 vs. 15 days, respectively), amyl nitrite use (4 vs. 2 days), and benzodiazepine use (37 vs. 4.5 days) compared to heterosexual males.

Drug related risk and harms

Significant differences were found across a number of domains reflecting harm associated with drug use (table 3). Homo/bisexual males and females were both more likely than their heterosexual counterparts to report recent drug injection, and were also more likely to report having injected drugs while under the influence of another drug(s) (Table 3).

Although the median frequency of crystal meth use did not differ between the two groups, a number of risk factors differed according to sexuality. Homo/bisexual males were significantly more likely than heterosexual males to report 'heavy' crystal meth use in the past 6 months (at least 45 days in the past 6 months; 12% vs. 2%, OR 5.29; 95%CI: 2.05, 13.68). Consistent with this, homo/bisexual males had significantly higher median scores on the Severity of Dependence Scale (SDS) for methamphetamine (median score 2 vs. 0), and were more likely to report that crystal meth was the primary form of methamphetamine about which they were concerned (43% vs. 21%; OR 2.85, 95%CI: 1.61, 5.04). Lesbian/bisexual females had similarly elevated SDS scores for methamphetamine (median 3 vs. 0) and were significantly more likely to attribute their concern primarily to crystal meth use (32% vs. 19%; Table 3). Using previously established cut-off scores indicative of 'dependence' upon methamphetamine (Topp and Mattick 1997), 34% of lesbian/bisexual women classified as dependent, compared to 21% of heterosexual women (OR 2.02; 95%CI: 1.08, 3.77). The rates were similar for men, although the difference did not reach statistical significance (28% GBM, 19% HM, $p < .1$).

Lesbian/bisexual women (24%) were significantly more likely than heterosexual women (8%) to report having injected methamphetamine in the past six months (OR 3.58; 95%CI: 1.78, 7.21); similarly, homo/bisexual men (23%) were more likely than heterosexual men (13%) to report having injected methamphetamine recently (OR 1.91; 95%CI: 1.03, 3.56).

No differences existed among females in the likelihood of having overdosed ('passed out', 'become unconscious') in the past 6 months; homo/bisexual males were significantly *less* likely than heterosexual males to report that they had done so (9% vs. 19%). There were no differences between groups in the likelihood of having accessed health services (such as emergency departments, hospitals, first aid, GPs, counsellors and so on) in the past 6 months. No differences existed between the two groups in the likelihood of reporting social, financial, work or legal problems related to drug use (Table 3).

Sexual risk practices

Rates of sexual activity were high (over 90% of all groups reported penetrative sex within the past 6 months).³

Females. Around nine in ten of each group (88%) reported a regular sex partner during this time. There was also no difference between the two groups in the proportions reporting

Table 3. Self-reported risk behaviours of ecstasy users by self-identified sexuality.

	Heterosexual Females		Lesbian/bisexual females		Heterosexual Males		Homo/bisexual males		Significance OR (95%CI)
% Injected drugs past 6 months	8.3	26.3	3.93 (1.99, 7.74)	15.8	26.1	1.89 (1.04, 3.40)			
% Injected under influence of drugs past 6 months	6.3	22.4	4.25 (2.03, 8.91)	11.0	23.2	2.45 (1.30, 4.60)			
% overdose in past 6 months	15.5	10.5	n.s.	19.1	8.7	0.40 (0.17, 0.96)			
% accessed health services in relation to drug use	15.9	22.4	n.s.	15.9	17.4	n.s.			
Median SDS score (methamphetamine)	0	3	$U=4132, p<.001$	0	2	$U=8847, p<.01$			
% reporting crystal was meth form of concern	18.9	31.7	1.98 (1.04, 3.79)	21.2	43.3	2.85 (1.61, 5.04)			
% penetrative sex past 6 months ¹	94.4	92.8	n.s.	93.3	91.3	n.s.			
% >6 penetrative sex partners past 6 months	4.4	11.8	2.94 (1.17, 7.40)	7.9	21.7	3.23 (1.66, 6.29)			
% sex under influence of drugs past 6 months	80.2	88.4	n.s.	74.4	90.5	3.27 (1.37, 7.79)			
% always protection with casual partners 6 months	45.9	48.9	n.s.	50.3	53.7	n.s.			
% sexual health tests past year	42.5	47.4	n.s.	23.5	42.0	2.36 (1.40, 3.99)			
% tested for hepatitis C past year	21.0	34.2	1.95 (1.11, 3.43)	22.4	52.2	3.78 (2.24, 6.36)			
% reporting last hepatitis C test positive	0.8	9.2	12.68 (2.58, 62.43)	2.9	8.7	3.24 (1.19, 8.83)			
% tested for HIV past year	27.8	46.1	2.22 (1.31, 3.77)	25.3	62.3	4.89 (2.88, 8.31)			
% reporting last HIV test positive	0.4	1.3	n.s.	0	13.0	n.s.			
% drug caused social problems	42.9	38.2	n.s.	34.1	37.7	n.s.			
% drug caused financial problems	39.7	31.6	n.s.	37.2	46.4	n.s.			
% drug caused work or study problems	51.2	39.5	n.s.	42.1	34.8	n.s.			
% drug caused legal problems	4.8	5.3	n.s.	8.8	8.7	n.s.			

Note: ¹ 'Penetrative sex' was defined as the penetration of the vagina or anus with penis/fist or similar.

having had a casual sex partner in the past 6 months (58% LBF vs. 50% HF). Lesbian/bisexual females were more likely than heterosexual females, however, to report having had more than six sexual partners within the past 6 months (12% vs. 4% table 3), and to have had anal sex within the past 6 months (28% vs. 13%; OR 2.62; 95%CI: 1.37, 5.04).

Similar rates of sex under the influence of drugs were reported by lesbian/bisexual females (88%) and heterosexual females (80%). The drug most commonly used during sex was ecstasy (84% each). Lesbian/bisexual women reported using a greater number of drug types during sex over the previous 6 months than heterosexual women (3 vs. 2; Mann-Whitney $U=4599$, $p<.01$). Lesbian/bisexual women were significantly more likely than heterosexual women to report the use of amyl nitrate (15% vs. 2%; OR 10.73; 95%CI: 2.82, 41.30), base methamphetamine (20% vs. 9%; OR 2.48; 95%CI: 1.11, 5.54), ketamine (7% vs. 2%; OR 4.35, 95%CI: 1.00, 20.17), and cannabis (49% vs. 28%; OR 2.50, 95%CI: 1.38, 4.53) during sex.

Males. Homo/bisexual males were more likely to report having had anal sex in the past 6 months (74%) than heterosexual men (OR 15.62; 95%CI: 8.42, 28.99), but a significant minority of the heterosexual males still reported having had anal sex (15%). Homo/bisexual males were less likely to report having had a regular partner in the past 6 months (69% vs. 83% of heterosexual males; OR 0.45; 95%CI: 0.25, 0.82), and more likely to report having had a casual partner during this time (76% vs. 62%; OR 1.94; 95%CI: 1.05, 3.58). Homo/bisexual males were also significantly more likely to report having had more than six sexual partners within the past 6 months (22% GBM vs. 8% HM; Table 3).

Homo/bisexual males were significantly more likely to report sex under the influence of drugs (91%) than heterosexual males (74%) in the past 6 months (table 3). The most commonly reported drug was ecstasy for both groups (84% HM, 83% GBM), and both groups reported having had sex under the influence of a median of two different drugs in the past 6 months. Consistent with the pattern found among women, there were differences in the types of drugs mentioned. Homo/bisexual men were more likely to report having had sex under the influence of crystal meth (30% vs. 10%; OR 3.88, 95%CI: 1.97, 7.64), ketamine (11% vs. 2%; OR 7.27; 95%CI: 2.14, 24.71) and amyl nitrite (14% vs. 2%; OR 7.16; 95%CI: 2.49, 20.63).

This finding is not surprising given that the rates of use of these drugs in the past 6 months were higher in general among homo/bisexual men than they were among heterosexual men (Table 2). However, it is important to note that (a) homo/bisexual males were more likely to report heavy crystal meth use (see above); and (b) there was a significant association among males (overall) between reporting heavy crystal meth use and reporting crystal use during sex (72% of heavy users reported this, compared to 10% of less frequent users; OR 23.55; 95%CI: 7.93, 69.96). Small sample sizes precluded further analysis according to sexuality, but it does suggest that heavy crystal users were more likely to report using the drug during sex; and that homo/bisexual males, might be using crystal during sex on a regular basis.

Health behaviours

Significant differences existed according to sexuality in the extent of testing for sexually transmitted infections and blood borne viruses. Just under one in four heterosexual women (21%) and men (22%) reported having a hepatitis C test, compared to 34% of lesbian/bisexual women and half of homo/bisexual men (52%). This may have been due to the

knowledge among these group that they were at higher risk (the prevalence of injecting drug use was higher in both groups), a possibility that was borne out by the higher rates of hepatitis C infection among homo/bisexual males and females (both 9%) compared to their heterosexual counterparts (women 1%, men 3%; Table 3). Rates of HIV testing were similarly higher among homo/bisexual men and women; however, the rate of HIV infection was only elevated among homo/bisexual men (13% vs. 0% of heterosexual men).

Discussion

This study compared the demographic characteristics, drug use histories and risk behaviours of a sample of persons regularly involved in the dance or nightclub scene and assessed whether sexuality was associated with differences among this group. Comparisons were made between homo/bisexual men and women and their heterosexual counterparts who were also involved in the dance scene. Previous research comparing heterosexual and homo/bisexual populations has typically involved general population samples, and it may be that higher rates of drug use reflect greater participation in the bar/nightclub scene. It was possible to consider whether unique patterns of drug use or risk exist among these groups; and consequently, whether responses to such drug use or risk need to be targeted in different ways for different groups within the dance scene.

Drug use patterns

This study documented a number of differences between groups according to their self-reported sexuality. Rates of use of newer drugs on the dance scene—crystal meth and ketamine—were high among homo/bisexual men and women, which is consistent with anecdotal evidence of increasing use in these communities in Australia. Recently, in Australia there has been concern because of reports of increases in GHB and crystal meth use among some subpopulations of the gay community (Degenhardt *et al.* 2005). These reports have sparked concern: studies with users of these drugs have noted high rates of potential harms such as overdose in the case of GHB (Degenhardt *et al.* 2002, Degenhardt *et al.* 2003), and harms related to the continued use of a potent form of methamphetamine, such as heart palpitations, psychosis and dependence (Degenhardt and Topp 2003, Farrell *et al.* 2002).

It was not merely such newer drugs that were more commonly used. There was a relatively consistent finding for lesbian/bisexual women to be significantly more likely than heterosexual women to be using prescription drugs. Benzodiazepine use among homo/bisexual men was also more prevalent and more frequent than among heterosexual men. The misuse of prescription drugs has been documented among other populations such as young people (Johnston *et al.* 2003, McCabe *et al.* 2005) and injecting drug users (Tacke 2002, Obadia *et al.* 2001, Valenciano *et al.* 2001, Zacny *et al.* 2003). The misuse of prescription medication by party drug users is a matter for potential concern (Gascoigne *et al.* 2004) given the possibility that users may begin stimulant-depressant cycles of drug use, and the dependence potential of both opioid and benzodiazepine medications (Darke, Ross *et al.* 1994, Dupont 1998, Zacny *et al.* 2003).

To a large degree, however, it seemed that the similarities between the groups were greater than the differences. Although there was some evidence that newer drug types were more commonly reported among homo/bisexual persons than heterosexual persons, the more established drug types were used in similar proportions; furthermore, with a couple of exceptions, the frequency of use of these drug types was typically similar.

The particular exception was that homo/bisexual men and women were more likely to score more highly on the Severity of Dependence Scale for methamphetamine, than their heterosexual counterparts, and to nominate crystal methamphetamine as the form of methamphetamine about which they were concerned. This finding could reflect greater awareness of the problems related to the use of this drug; alternatively, it could reflect the greater community concern about its use (and susceptibility of users to be concerned about their use) (Degenhardt *et al.* 2005). However, given the risk behaviours associated with the use of crystal methamphetamine in this sample and in previous literature (Halkitis *et al.* 2001, Frosch *et al.* 1996, Anderson and Flynn 1997), this finding suggests that some users may be in need of assistance with their use of this drug (Degenhardt *et al.* 2005). More detailed research is needed to examine the context, motivations for and circumstances surrounding the use of crystal meth among these different groups.

Risk behaviours

Self-reported risk behaviours such as unprotected sex and needle sharing (among those who had injected drugs) did not differ according to sexuality. However, homo/bisexual men and women were significantly more likely than heterosexual men and women to report a drug use during sex, a greater number of sexual partners and higher rates of injecting drug use. Rates of hepatitis C were also higher, and HIV was more common among homo/bisexual males (by self-report). These self-reported higher rates of blood borne viral infections suggest that when these groups *do* engage in risky behaviours, they and their partners may be at higher risk of transmission of infection. Increasing rates of unprotected anal intercourse among homosexually active men in recent years in Australia (Van de Ven *et al.* 2002) as well as increased rates of sexually transmitted infections (Jin *et al.* 2005) point to the need to address factors that may be related to such risks.

There has been considerable concern, particularly in the USA, about the potential links between drug use and sexual risk behaviours. Crystal meth use has been associated with sexual activity (Morgan and Beck 1997), and high-risk sexual activity in particular (Kall and Nilsonne 1995, Semple *et al.* 2002). It is important to consider the reasons why an association exists between drug use and sex risk behaviours. It is unlikely to reflect a simplistic causal mechanism whereby the drug in some way compels the user to take unanticipated (or unwanted) risks. There is good evidence to suggest that crystal meth use and risky sexual behaviours co-occur within a constellation of other important factors such as the effects of the drug; motivations for use (Diaz *et al.* 2005, Halkitis *et al.* 2005, Ross *et al.* 2003, Smith *et al.* 2004, McKirnan *et al.* 2001); perceptions of risk (Crepaz *et al.* 2004, Halkitis *et al.* 2005, McKirnan *et al.* 2001); and the types of persons taking such risks (Kall and Nilsonne 1995, Patterson *et al.* 2005). It is important to note, however, that the increased likelihood of sex risk behaviours among homosexually active men is likely to reflect not only differences in drug use, but also to reflect views about HIV infection and treatment (Elford and Hart 2005, Crepaz *et al.* 2004). There has been a suggestion that individual factors such as sensation seeking, along with drug use, is associated with greater sex risk behaviours among homosexually active men (Dolezal *et al.* 1997).

Regardless of the reasons for the association between drug use and sex risk, previous research has suggested that addressing crystal meth use among those who are dependent upon the drug may lead to a reduction in HIV risk behaviours (Shoptaw and Frosch 2000). Addressing problematic drug use among homo/bisexual men may therefore reduce harms related to problematic drug use as well as reduce the risks associated with unsafe sexual behaviours.

Conclusions

Among a group of people who were recruited because they were regularly involved in party drug market, sexual identity was associated with some higher rates of some drug use, but in general, the patterns and frequency of drug use was similar for both groups. Sexuality was a marker, however, for a number of risk behaviours that included injecting drug use, greater sexual activity, and higher scores on measures of methamphetamine dependence. These findings suggest that initiatives designed to reduce harms related to injecting and sex risk may be needed for a greater proportion of homo/bisexual males and females who are involved in the dance/nightclub scene. Such interventions need not only to educate these users, but also to consider the motivations behind the risks and patterns of drug use that are occurring. Future research needs to examine the reasons why these differences occur.

Acknowledgements

The Party Drugs Initiative was funded by the National Drug Law Enforcement Research Fund (NDLERF). The following researchers contributed to the collection of data across Australia: Courtney Breen, Raimondo Bruno, Françoise Chanteloup, Jane Fischer, Rebecca Jenkinson, Jennifer Johnston, Stuart Kinner, Anne-Marie Laslett, Chris Moon, Jaclyn Newman, Phoebe Proudfoot, Jeff Ward and Jo Weekley. Many thanks go to Libby Topp and Karen Price, who provided useful feedback on previous versions of the manuscript. Finally, thanks to the regular ecstasy users who were willing to be interviewed and share their experience.

Notes

1. This paper distinguishes between the powder form of methamphetamine that has traditionally been available in Australia ('speed'), and the more potent forms: methamphetamine base ('base') and crystalline methamphetamine ('crystal'). Speed is typically manufactured in Australia and ranges in colour due to differences in the chemicals used to produce it. It is usually of relatively low purity. Base (also called paste, wax, point or pure), is thought to be an oily or gummy, damp, sticky, powder that often has a brownish tinge. Base, like speed, is thought to be manufactured in Australia. Crystal meth is a crystal or coarse powder that ranges from translucent to white but may also have a green, blue or pink tinge. Crystal is thought to be manufactured in Asia and imported. See Stafford *et al.* (2005).
2. It should be noted that use of antidepressants includes both prescription and non-prescription use. Daily use (180 days) is likely to indicate maintenance for medical purposes for the past 6 months.
3. 'Penetrative sex' was defined as the penetration of the vagina or anus with penis/fist or similar.

References

- Anderson, R. and Flynn, N. (1997) The methamphetamine-HIV connection in Northern California. In H. Klee (ed.) *Amphetamine misuse: International perspectives on current trends* (Amsterdam: Harwood Academic), pp. 181–195.
- Anonymous (2004) Acute HIV infections are discovered in Charlotte. *AIDS Alert*, 93–94.
- Biernacki, P. and Waldorf, D. (1981) Snowball sampling: Problems, techniques and chain referral sampling. *Sociological Methods for Research*, 10, 141–163.
- Boddiger, D. (2005) Metamphetamine use linked to rising HIV transmission. *Lancet*, 365, 1217–1218.
- Boys, A., Lenton, S. and Norcross, K. (1997) Polydrug use at raves by a Western Australian sample. *Drug and Alcohol Review*, 16, 227–234.
- Breen, C., Degenhardt, L., White, B., Bruno, R., Chanteloup, F., Fischer, J., Moon, C., Proudfoot, P., Richards, J., Ward, J. and Weekley, J. (2004) *Australian Party Drug Trends 2003. Findings from the Party Drugs Initiative (PDI)* (University of New South Wales: National Drug and Alcohol Research Centre).

- Breen, C., Topp, L. and Longo, M. (2002) *Adapting the IDRS methodology to monitor trends in party drug markets: Findings of a 2-year Feasibility trial* (University of New South Wales: National Drug and Alcohol Research Centre).
- Burgard, S., Cochran, S. and Mays, V. (2005) Alcohol and tobacco use patterns among heterosexually and homosexually experienced California women. *Drug and Alcohol Dependence*, 77, 61–70.
- Chesney, M., Barrett, D. and 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.
- Cochran, S. (2001) Emerging issues in research on lesbians' and gay men's mental health: Does sexual orientation really matter? *American Psychologist*, 56, 931–947.
- Cochran, S., Ackerman, D., Mays, V. and Ross, M. (2004) Prevalence of non-medical drug use and dependence among homosexually active men and women in the US population. *Addiction*, 99, 989–998.
- Colfax, G., Mansergh, G., Guzman, R., Vittinghoff, E., Marks, G., Rader, M. and Buchbinder, S. (2001) Drug use and sexual risk behaviour among gay and bisexual men who attend circuit parties: A venue-based comparison. *J AIDS*, 28, 373–379.
- Colfax, G., Vittinghoff, E., Husnik, M., McKirnan, D. J., Buchbinder, S., Koblin, B., Celum, C., Chesney, M., Huang, Y., Mayer, K., Bozeman, S., Judson, F., Bryant, K. and Coates, T. (2004) Substance use and sexual risk: A participant and episodic level analysis among a cohort of men who have sex with men. *American Journal of Epidemiology*, 159, 1002–1012.
- Crepaz, N., Hart, T. and Marks, G. (2004) Highly active antiretroviral therapy and sex risk behaviour. *Journal of the American Medical Association*, 292, 224–236.
- Dalgarno, P. J. and Shewan, D. (1996) Illicit use of ketamine in Scotland. *Journal of Psychoactive Drugs*, 28, 191–199.
- Darke, S., Cohen, J., Ross, J., Hando, J. and Hall, W. (1994) Transitions between routes of administration of regular amphetamine users. *Addiction*, 89, 1077–1083.
- Darke, S., Ross, J. and Cohen, J. (1994) The use of benzodiazepines among regular amphetamine users. *Addiction*, 89, 1683–1690.
- Degenhardt, L., Darke, S. and Dillon, P. (2002) GHB use among Australians: Characteristics, use patterns, and associated harm. *Drug and Alcohol Dependence*, 67, 89–94.
- Degenhardt, L., Darke, S. and Dillon, P. (2003) The prevalence and correlates of GHB overdose among Australian users. *Addiction*, 98, 199–204.
- Degenhardt, L., McGuigan, D. and Clayton, S. (2005) *Rapid assessment of trends in crystal methamphetamine and GHB use in the gay, lesbian, bisexual and transgender community in New South Wales. NDARC Technical Report* (University of New South Wales: National Drug and Alcohol Research Centre).
- Degenhardt, L. and Topp, L. (2003) 'Crystal meth' use among polydrug users in Sydney's dance party subculture: characteristics, use patterns and associated harm. *International Journal of Drug Policy*, 14, 17–24.
- Diaz, R. M., Heckert, A. L. and Sanchez, J. (2005) Reasons for stimulant use among Latino gay men in San Francisco: a comparison between methamphetamine and cocaine users. *Journal of Urban Health*, 82 (Suppl.), i71–i78.
- Dolezal, C., Meyer-Bahlburg, H., Remien, R. and Petkova, E. (1997) Substance use during sex and sensation seeking as predictors of sexual risk behaviour among HIV+ and HIV- gay men. *AIDS and Behavior*, 1, 19–28.
- Dupont, R. L. (1998) Abuse of benzodiazepines: the problems and the solutions. *American Journal of Drug and Alcohol Abuse*, 14, 1–69.
- Elford, J. and Hart, G. (2005) HAART, viral load and sexual risk behaviour. *AIDS*, 19, 205–207.
- Farrell, M., Marsden, J., Ali, R. and Ling, W. (2002) Methamphetamine: drug use and psychoses becomes a major public health issue in the Asia Pacific region. *Addiction*, 97, 771–772.
- Forsyth, A. J. M. (1996) Places and patterns of drug use in the Scottish dance scene. *Addiction*, 91, 511–521.
- Frosch, D., Shoptaw, S., Huber, A., Rawson, R. and Ling, W. (1996) Sexual risk among gay and bisexual male methamphetamine abusers. *Journal of Substance Abuse Treatment*, 13, 483–486.
- Gascoigne, M., Copeland, J. and Dillon, P. (2004) *Ecstasy and the concomitant use of pharmaceuticals. NDARC Technical Report No. 201* (University of New South Wales: National Drug and Alcohol Research Centre).
- Gilman, S., Cochran, S., Mays, V., Hughes, M., Osrow, D. and Kessler, R. (2001) Risk of psychiatric disorders among individuals reporting same-sex sexual partners in the National Comorbidity Survey. *American Journal of Public Health*, 91, 933–939.
- Gonzales, V., Washienko, K., Krone, M., Chapman, L., Arredondo, E., Huckeba, H. and Downer, A. (1999) Sexual and drug use risk factors for HIV and STDs: A comparison of women with and without bisexual experiences. *American Journal of Public Health*, 89, 1841–1846.
- Halkitis, P., Parsons, J. T. and Stirratt, M. (2001) A double epidemic: Crystal methamphetamine use in relation to HIV transmission among gay men. *Journal of Homosexuality*, 41, 17–35.

- Halkitis, P. N., Green, K. A. and Mourgues, P. (2005) Longitudinal investigation of methamphetamine use among gay and bisexual men in New York City: findings from Project BUMPS. *Journal of Urban Health*, 82 (Suppl.), i18–i25.
- Hando, J. and Hall, W. (1993) *Amphetamine use among young adults in Sydney, Australia* (Sydney: NSW Health Department).
- Hando, J., Topp, L. and Hall, W. (1997) Amphetamine-related harms and treatment preferences of regular amphetamine users in Sydney, Australia. *Drug and Alcohol Dependence*, 46, 105–113.
- Hess, L. (1995) Changing family patterns in Western Europe. In M. Rutter and D. Smith (eds.) *Psychosocial disorders in young people: Time trends and their causes* (Chichester: John Wiley & Sons).
- Hillier, L., De Visser, R., Kavanagh, A. M. and McNair, R. P. (2003) The association between licit and illicit drug use and sexuality in young Australian women. *Medical Journal of Australia*, 179, 326–327.
- Hughes, T. and Eliason, M. (2002) Substance use and abuse in lesbian, gay, bisexual and transgender populations. *Journal of Primary Prevention*, 22, 263–298.
- Jin, F., Prestage, G., Kippax, S., Pell, C., Donovan, B., Kaldor, J., Grulich, A., on behalf of the Australian–Thai Vaccine Consortium, (2005) Epidemic syphilis among homosexually active men in Sydney. *Medical Journal of Australia*, 183, 179–183.
- Johnston, L. D., O'Malley, P. M. and Bachman, J. G. (2003) *National Survey Results on Drug Use from the Monitoring the Future Study, 1975–2003* (Rockville, MD: National Institute on Drug Abuse).
- Kall, K. and Nilsson, A. (1995) Preference for sex on amphetamine: A marker for HIV risk behaviour among male intravenous amphetamine users in Stockholm. *AIDS Care*, 7, 171–188.
- Kerlinger, F. N. (1986) *Foundations of Behavioral Research* (Japan: CBS Publishing Limited).
- Lee, S., Galanter, M., Dermatis, H. and McDowell, H. (2003) Circuit parties and patterns of drug use in a subset of gay men. *Journal of Addictive Diseases*, 22, 47–60.
- Mansergh, G., Colfax, G. N., Marks, G. and Rader, M. (2001) The circuit party men's health study: findings and implications for gay and bisexual men. *American Journal of Public Health*, 91, 953–958.
- McCabe, S. E., Teter, C. and Boyd, C. J. (2005) Illicit use of prescription pain medication among college students. *Drug & Alcohol Dependence*, 77, 37–47.
- McKirnan, D. J., Vanable, P. A., Ostrow, D. G. and Hope, B. (2001) Expectancies of sexual 'escape' and sexual risk among drug and alcohol-involved gay and bisexual men. *Journal of Substance Abuse*, 13, 137–154.
- Morgan, P. and Beck, J. (1997) The legacy and the paradox: Hidden contexts of methamphetamine use in the United States. In H. Klee (ed.) *Amphetamine misuse: International perspectives on current trends* (Amsterdam: Harwood Academic Publishers), pp. 135–162.
- Obadia, Y., Perrin, V., Feroni, I., Vlahov, D. and Moatti, J. P. (2001) Injecting misuse of buprenorphine among French drug users. *Addiction*, 96, 267–272.
- Ovendon, C. and Loxley, W. (1996) Bingeing on psychostimulants in Australia: Do we know what it means (and does it matter)? *Addiction Research*, 4, 33–43.
- Parks, C. (1999) Lesbian social drinking: the role of alcohol in growing up and living as a lesbian. *Contemporary Drug Problems*, 26, 75–129.
- Patterson, T. L., Semple, S. J., Zians, J. K. and Strathdee, S. A. (2005) Methamphetamine-using HIV-positive men who have sex with men: correlates of polydrug use. *Journal of Urban Health*, 82 (Suppl.), i120–i126.
- Peters, A., Davies, T. and Richardson, A. (1997) Increasing popularity of injection as the route of administration of amphetamine in Edinburgh. *Drug and Alcohol Dependence*, 48, 227–237.
- Rawstorne, P. and Worth, H. (2004) Crystal methamphetamine use and 'unsafe' sex. *HIV Australia*, 14–16.
- Reback, C. and Grella, C. (1999) HIV risk behaviors of gay and bisexual male methamphetamine users contacted through street outreach. *Journal of Drug Issues*, 29, 155–166.
- Richters, J., Bergin, S., Lubowitz, S. and Prestage, G. (2002) Women in contact with Sydney's gay and lesbian community: sexual identity, practice and HIV risks. *AIDS Care*, 14, 193–202.
- Ross, M., Mattison, A. and Franklin, D. (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.
- Rusch, M., Lampinen, T. M., Schilder, A. and Hogg, R. S. (2004) Unprotected anal intercourse associated with recreational drug use among young men who have sex with men depends on partner type and intercourse role. *Sexually Transmitted Diseases*, 31, 492–498.
- Ryan, H., Wortley, P., Easton, A., Pederson, L. and Greenwood, G. (2001) Smoking among lesbians, gays and bisexuals: A review of the literature. *American Journal of Preventive Medicine*, 21, 132–149.
- Semple, S., Patterson, T. L. and Grant, I. (2004) A comparison of injection and non-injection methamphetamine-using HIV positive men who have sex with men. *Drug and Alcohol Dependence*, 76, 203–212.
- Semple, S. J., Patterson, T. L. and Grant, I. (2002) Motivations associated with methamphetamine use among HIV+ men who have sex with men. *Journal of Substance Abuse Treatment*, 22, 149–156.

- Shoptaw, S. and Frosch, D. (2000) Substance abuse treatment as HIV prevention for men who have sex with men. *AIDS and Behavior*, 4, 193–203.
- Slavin, S. (2004) Crystal methamphetamine use among gay men in Sydney. *Contemporary Drug Problems*, 31, 425–465.
- Smith, G., Worth, G. and Kippax, S. (2004) *Sexual adventurousness among Sydney gay men* (University of New South Wales: National Centre in HIV Social Research).
- Solowij, N., Hall, W. and Lee, N. (1992) Recreational MDMA use in Sydney: A profile of ‘Ecstasy’ users and their experiences with the drug. *British Journal of Addiction*, 87, 1161–1172.
- Stafford, J., Degenhardt, L., Agaliotis, M., Chanteloup, F., Fischer, J., Matthews, A., Newman, J., Proudfoot, P., Stooze, M. and Weekley, J. (2005) *Australian Trends in Ecstasy and Related Drug Markets 2004: Findings from the Illicit Drug Reporting System (IDRS)* (University of New South Wales: National Drug and Alcohol Research Centre).
- Tacke, U. (2002) Abuse of buprenorphine by intravenous injection—the French connection [comment]. *Addiction*, 97, 1355.
- Thiede, H., Valleroy, L., MacKellar, D., Celentano, D., Ford, W., Hagan, H., Koblin, B., LaLota, M., McFarland, W., Sheehan, D., Torian, L., for the Young Men’s Study Group, (2003) Regional patterns and correlates of substance use among young men who have sex with men in seven urban areas. *American Journal of Public Health*, 93, 1915–1921.
- Topp, L., Breen, C., Kaye, S. and Darke, S. (2004) Adapting the Illicit Drug Reporting System (IDRS) methodology to examine the feasibility of monitoring trends in party drug markets. *Drug and Alcohol Dependence*, 73, 189–197.
- Topp, L., Hando, J., Degenhardt, L., Dillon, P., Roche, A. and Solowij, N. (1998) Ecstasy Use in Australia (University of New South Wales: National Drug and Alcohol Research Centre).
- Topp, L., Hando, J., Dillon, P., Roche, A. and Solowij, N. (2000) Ecstasy use in Australia: Patterns of use and associated harms. *Drug and Alcohol Dependence*, 55, 105–115.
- Topp, L. and Mattick, R. (1997) Choosing a cut-off on the Severity of Dependence Scale (SDS) for amphetamine users. *Addiction*, 92, 839–845.
- Urbina, A. and Jones, K. (2004) Crystal methamphetamine, its analogues, and HIV infection: medical and psychiatric aspects of a new epidemic. *Clinical Infectious Diseases*, 38, 890–894.
- Valenciano, M., Emmanuelli, J. and Lert, F. (2001) Unsafe injecting practices among attendees of syringe exchange programmes in France [see comment]. *Addiction*, 96, 597–606.
- Van de Ven, P., Rawstorne, P., Crawford, J. and Kippax, S. (2002) Increasing proportions of Australian gay and homosexually active men engage in unprotected anal intercourse with regular and with casual partners. *AIDS Care*, 14, 335–341.
- Zacny, J., Bigelow, G., Compton, P., Foley, K., Iguchi, M. Y. and Sannerud, C. (2003) College on Problems of Drug Dependence taskforce on prescription opioid non-medical use and abuse: position statement. *Drug and Alcohol Dependence*, 69, 215–232.