



**Substance use and sexual risk-taking among men who have sex with men (MSM):  
Implications for health promotion and HIV prevention**

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## *Summary*

The purpose of this literature review is to provide an overview regarding relevant issues regarding substance use and sexual activity primarily among men who have sex with men (MSM<sup>1</sup>) and a review of previous research in order to assist in informing the development of a health promotion campaign focussing on substance use and sexual activity by the Queensland AIDS Council. MSM use a variety of substances and compared with the general population MSM may be more likely to use certain substances or engage in poly-substance use. It is less clear if MSM are more likely to experience problematic substance use, however the health consequences of intoxication can be considerable amongst this group. It is well known that substance use results in a variety of desirable and undesirable consequences. These consequences can impact upon sexual behaviour via a range of direct and indirect mechanisms and may make sexual risk-taking more likely among some MSM. A variety of hypotheses and models have been proposed to explain the strong associations between substance use and sexual risk-taking and extensive research has been conducted in support of these. Future health promotion efforts should involve multi-faceted approaches that engage target communities and focus on particular aspects of substance use, as well as broader social and cultural factors.

## *Outline*

This literature review provides an overview and discussion of the following topics related to MSM and the general population:

- 1) Substances commonly used in Australia;
- 2) Patterns of substance use;
- 3) Historical, cultural and societal factors and contexts of substance use;
- 4) Relationships between substance use and sexual/risk-taking; and
- 5) Summary of health promotion/HIV transmission prevention issues.

## **Section 1: Substances commonly used in Australia**

The following summary represents the most commonly used recreational drugs amongst gay and bisexual men in Queensland based on broad scale surveys conducted

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<sup>1</sup> For the purposes of this report, the term “MSM” is intended to be inclusive and refer to 1) gay men, 2) bisexual men and 3) men who have sex with men who may not identify as being gay.

throughout Queensland (Hull et al., 2004) and in Brisbane (Knox, Kippax, Crawford, Prestage & Van de Ven, 1999).

### *Alcohol*

Alcohol is classed as a depressant, as it operates by slowing down the functions of the central nervous system. In smaller quantities alcohol can induce feelings of relaxation and reduced inhibition, and alcohol is commonly used for its perceived effects on sociability and relaxation (Critchlow, 1986). However, depressants can also impair concentration and coordination and can reduce one's ability to deal with unexpected situations (Australian Drug Foundation, 2000). Other short-term risks associated with alcohol use include: dehydration, headaches, reduced performance, mood changes, impaired movement or coordination and increased risk of injuries or accidents (Queensland Health, 2001a).

### *Amphetamines*

This drug class refers to a variety of substances that release specific chemicals, or neurotransmitters, in the brain including: norepinephrine, dopamine and serotonin (Gorman, Barr, Hansen, Robertson & Green, 1997). Individuals who use amphetamines report increased energy levels, alertness and enhanced self-confidence (Kaplan & Sadock, 1990) and amphetamine use is associated with social and sexual encounters (Darke, Ross, Cohen, Hando & Hall, 1995). Use of amphetamines is also associated with headaches, dizziness, blurred vision, restlessness, psychosis and loss of coordination (Queensland Health, 2001b). Some commonly used types of amphetamines include Ecstasy, speed, dexamphetamine and crystal methamphetamine. Crystal methamphetamine and Ecstasy are described in further detail below.

*Crystal methamphetamine.* Crystal methamphetamine (d-methamphetamine hydrochloride), also referred to as "crystal meth", "crystal", "ice" and "Tina" (Slavin, 2004a), is used via injection, smoking and swallowing. It creates feelings of intense pleasure, invulnerability and increased self-confidence due to the release of dopamine (Slavin, 2004b). As a stimulant, methamphetamines can intensify emotions, increase energy, elevate self-esteem and heighten sexuality, while reducing inhibitions and impairing judgement (Gawin & Ellinwood, 1988). Use of stimulant drugs, such as crystal methamphetamine, has been demonstrated to be an important part of a highly sexualised subculture among some gay men (Guss, 2000).

*Ecstasy*. Also referred to as MDMA, Ecstasy (3, 4-methylenedioxy-methamphetamine) has been used in Australia for recreational purposes since the late 1980s (Ryder, Salmon & Walker, 2001). In addition to general amphetamine properties, Ecstasy is associated with hallucinogenic and emotional effects (e.g., increased affection and empathy, enhanced mood; Avis, 1999). Ecstasy is commonly used at raves and other dance parties (Klitzman, Pope & Hudson, 2000; Lenton, Boys & Norcross, 1997). Researchers have also warned that Ecstasy when combined with some medications used to manage HIV infection can result in fatal drug interactions (Harrington, Woodward, Hooton & Horn, 1999; Henry, Jeffreys & Dawling, 1992; Henry & Hill, 1998)

#### *Amyl nitrate*

This substance is a volatile liquid comprised of alcohol, sodium nitrite and sulphuric acid. Sometimes referred to as “poppers” or “amyl”, amyl nitrate is primarily used to get high and is often used amongst gay men in sexual contexts (Lange, Haertsen, Hickey, Snyder, Dax & Jaffe, 1988). Amyl nitrate has been used over the past few decades to enhance physical pleasure during sexual activity (Everett, 1972) and its use has been associated with increased libido, improved erectile functioning and enhanced sexual experiences (Israelstam, Lambert & Oki, 1978). Some of the negative symptoms reported with its use include headaches, minor burns, breathing difficulties, poor coordination and balance, nausea, blurred vision and lethargy (French & Power, 1997). Chronic use of amyl nitrate has been linked with decreased immune functioning, which may facilitate HIV transmission to HIV-negative sexual partners (Lange et al., 1988).

#### *Marijuana*

Marijuana (delta-9-tetrahydrocannabinol or THC) is derived from the plant *Cannabis sativa* and is used via smoking or ingestion. Marijuana can contain over 400 different chemicals, which are referred to as cannabinoids (Grilly, 1994). Marijuana has been used for recreational, social and medicinal purposes for many decades and is associated with the following effects: altered consciousness, mild euphoria, relaxation, distorted perceptions of time, talkativeness and an intensification of normal experiences (Ryder et al., 2001). Other, more negative, consequences associated with its use include: dry mouth, increased heart rate and decreased sweating, and marijuana can cause impairments to memory and cognition functioning, speaking abilities, problem solving and concept formation (Grilly, 1994).

*Ketamine.* Ketamine, commonly referred to as “Special K”, is a substance that has anesthetic properties and can result in psychotic symptoms, perceptual distortions, impaired vision and hearing and confusion regarding sense of time (Grilly, 1994). Ketamine is commonly used at social gatherings and is sold in liquid or powder form. It is reported to induce the following dissociative and related effects: feelings of detachment, disconnection and defragmentation, perceptual disturbances and impaired cognitive functioning (McDowell, 2000).

*Viagra.* Viagra, or Sildenafil, is a medication prescribed to improve erectile difficulties and functioning. According to Crosby and DiClemente (2004) this medication is sometimes used simultaneously or sequentially<sup>2</sup> with other recreational substances (e.g., methamphetamine, cocaine, marijuana, amyl nitrate, alcohol) among MSM to produce heightened effects. Some of the positive effects associated with combined use include enhanced sexual desire and feelings of warmth, however combining Viagra with other substances can also result in headaches, intoxication and genital soreness, and the use of Viagra with amyl nitrate can also increase the likelihood of having a heart attack or stroke (Aldridge & Measham, 1999).

## **Section 2: Patterns of substance use**

### *Overview*

Epidemiological studies of alcohol and other drug use and misuse within gay and lesbian populations, suggest an incidence of substance misuse among samples from developed countries of approximately 30%, with a range between 28-35%, which contrasts with an incidence of 10-12% amongst the general population (Cabaj, 2000). Specific to Australia prevalence rates of illicit/recreational substance use have been estimated to be 17% amongst the general population (Commonwealth Department of Health and Family Services, 1996) versus up to 53% amongst MSM (Crawford, Kippax, Rodden, Donohoe & Van de Ven, 1998). Other studies have demonstrated comparable rates of alcohol and drug use and misuse amongst gay men and the general population (Drabble, Midanik & Trocki, 2004; McKirman & Peterson, 1989; Stall & Wiley, 1988), however it has been suggested that gay men have

increased poly-substance use over that of the general population. In addition, *certain drugs* (e.g., amyl nitrate, amphetamines, marijuana) are more popular among this group (Stall, Coates & Hoff, 1988). According to Stall and colleagues (1988) few gay men use any one drug to excess, which may suggest low rates of drug dependence, however the health risks associated with the nature of use and the consequences of intoxication are considerable (Smith, Lindsay & Rosenthal, 1999).

Researchers have noted significant methodological problems in some of the previous research on prevalence rates of substance use/misuse among gay and lesbian samples. Some estimates of substance use among gay men and lesbians have been limited by small samples and recruiting participants exclusively from bars (Cochran, Keenan, Schober & Mays, 2000). Other limitations have included poor or absent control groups, unrepresentative population samples and failure to use uniform definitions of substance abuse or sexual identity (Cabaj, 2000). In addition, convenience based samples may suffer from self-selection bias, as highly motivated volunteer samples may not be representative of the target group (Cochran & Mays, 2000). When considering health promotion related to substance use and sexual risk-taking, patterns of recent substance use represent the most relevant statistics, however lifetime use and problematic use will also be briefly discussed.

#### *Recent use*

A review of recent use<sup>3</sup> may be the most useful statistics in informing health promotion campaigns, and patterns in use may be closely linked with trends in new HIV diagnoses (Ostow et al., 1993). The Queensland Gay Periodic Survey (Hull et al., 2004) reported on the most commonly used recreational substances among 1667 gay, bisexual and other homosexually active men in Australia who were recruited from a range of gay community venues. Hull and colleagues (2004) reported the following percentages of participants reporting substance use in the previous six months: marijuana (41%), Ecstasy (33%); amyl nitrate (32%); speed (24%), crystal meth (16%), cocaine (10%), Viagra (10%), Special K (9%), LSD/trips (7%), heroin (2%) and steroids (2%). Comparisons made with previous periodic surveys indicated an increased trend for amyl, Ecstasy, crystal meth and Viagra use compared

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<sup>2</sup> A form of poly-substance use, sequential use refers to "...the combining of different drugs to create a desired effect. For example, a user takes acid after the effects of her/his ecstasy has come on, in order to heighten the sensation of colour and sound." (Southgate & Hopwood, 1999, p. 39).

<sup>3</sup> A summary of the recent substance use data described in this report is located in Appendix A.

with the 2003 survey data, and increased Ecstasy and cocaine use and decreased speed use compared with the 2000 survey data (Hull et al., 2004).

Another survey conducted in Brisbane indicated similar patterns in illicit substance use during the past six months among 299 gay men recruited via gay community advertisements (Knox et al., 1999). This study found that the following percentages of participants reported substance use in the previous six months: marijuana (58%), amyl nitrate (46%), psychostimulants (e.g., speed, Ecstasy, cocaine, ice, MDA; 31%), speed (27%), Ecstasy (16%), benzodiazepines (16%), hallucinogens (e.g., LSD, mushrooms; 16%), cocaine (9%) and heroin (6%). The authors concluded that substance use is normative among gay men in major Australian cities (Knox et al., 1999).

Among a recent self-selected sample of 20 gay and bisexual men recruited via posters in sexual health and gay specialist medical centres from the Brisbane area, the following percentages of participants reported substance use in the previous three months: alcohol (80%), marijuana (80%), amyl nitrate (40%), amphetamines (40%), Ecstasy (20%), prescription medication for recreational purposes (e.g., Valium, Oxycontin; 20%), heroin (15%) and ketamine (Special K; 10%; Mullens, Young, Hamernik & Dunne, 2005). However, this sample was not necessarily representative as participants were self-selected and recruited specifically in regard to learning about their positive and negative experiences with substance use.

An additional study of 1064 HIV-positive men in Australia, as part of the “HIV Futures 4” survey, indicated the following percentages of participants reported recreational substance use during the previous 12 months: alcohol (76%), marijuana (48%), amyl (29%), Ecstasy (23%), Viagra or similar (17%), speed (not injected; 14%), crystal meth (12%), speed (injected; 12%), cocaine (not injected; 5%), LSD/trips (4%), steroids (injected; 4%), GHB/GBH/Fantasy (3%), methadone (prescribed; 2%), heroin (injected; 2%), “homebake” (2%), cocaine (injected; 1%), methadone (other; 0.8%) and heroin (not injected; 0.5%; Grierson, Thorpe, Saunders & Pitts, 2004). The authors concluded that MSM were more likely than other groups to have used alcohol, Ecstasy, amyl nitrate and crystal meth and less likely to have injected heroin or used methadone (Grierson et al., 2004).

Comparison data in regard to MSM in other developed countries indicated similar trends in use. A study of 147 gay and bisexual men recruited via flyers advertisements in New

York City indicated the following percentages of participants reporting substance use in the previous two months: marijuana (56%), inhalants (25%), amphetamines (19%), psychedelics (16%), cocaine (15%), narcotics (11%), barbiturates (9%) and tranquilizers (9%; Gillmore, Morrison, Leigh, Hoppe, Gaylord & Rainey, 2002). Another study conducted in the United States comprised of 202 gay and bisexual men recruited from gay social venues reported the following percentages of participants had used substances in the previous three months: alcohol (83%), marijuana (41%), inhalants (29%), cocaine (22%), Ecstasy (16%), barbiturates (11%), hallucinogens (10%), methamphetamine (10%), GHB (5%) and heroin (3%; Halkitis & Parsons, 2002).

Estimates from the 2004 National Drug Strategy Household Survey (Australian Institute of Health and Welfare, 2004), conducted by the Australian Government, reported the following substance use (in the previous 12 months) amongst the general population: alcohol (83.6%), marijuana (11.3%), MDMA (Ecstasy; 3.4%), methamphetamines (3.2%), pain-killers/analgesics (3.1%), cocaine (1.0%), tranquilisers/sleeping pills (1.0%), hallucinogens (0.7%), inhalants (e.g., amyl nitrate; 0.4%), ketamine (0.3%), barbiturates (0.2%), heroin (0.2%), other opiates/opioids (0.2%), methadone (0.1%), GHB (0.1%) and steroids (0%; Australian Institute of Health and Welfare, 2004). Comparison data amongst the total population suggest comparable rates of alcohol use, however MSM are more likely to use certain substances such as amyl nitrate, Ecstasy, amphetamines, marijuana and Special K.

#### *Lifetime use*

Estimates of lifetime use in Australia are less common than estimates of recent use and may be less informative in guiding health promotion campaigns than trends in recent use. A recent sample of gay and bisexual men in Brisbane indicated the following percentages of participants reported lifetime use of: alcohol (100%), marijuana (95%), amphetamines (90%), Ecstasy (85%), amyl nitrate (80%), LSD/acid (70%), cocaine (55%), prescription medications for recreational purposes (50%), heroin (35%) and ketamine (Special K; 30%; Mullens et al., 2005). Another study conducted with adolescents in Australia indicated that adolescent males and females with same-sex attraction were significantly more likely to have used injected drugs in their lifetime than other adolescents (Smith et al., 1999). Knox and colleagues (1999) found a similar pattern, in that MSM were significantly more likely to have used injected drugs in their lifetime.

Estimates from the 2004 National Drug Strategy Household Survey (Australian Institute of Health and Welfare, 2004) reported the following lifetime use of substances among the general population: alcohol (90.7%), marijuana (33.6%), methamphetamines (9.1%), other opiates/opioids (9.1%), hallucinogens (7.5%), MDMA (Ecstasy; 7.5%), pain-killers/analgesics (5.5%), cocaine (4.7%), tranquilisers/sleeping pills (2.8%), inhalants (2.5%), heroin (1.4%), barbiturates (1.1%), ketamine (1.0%), GHB (0.5%), methadone (0.3%) and steroids (0.3%). Similar to comparisons regarding recent use, comparable rates of alcohol use exist among MSM and the general population, however MSM are more likely to use a greater variety of substances, including injected drugs, across their lifetime.

#### *Problematic substance use*

Some research suggests that lesbians and gay men experience higher rates of problematic use of alcohol and other substances (Bux, 1996; Hughes & Wilsnack, 1994) however other studies have not (Cabaj, 2000). Problematic substance use is often conceptualised in terms of 1) substance abuse or 2) substance dependence. According to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1994) substance abuse refers to a maladaptive pattern of substance use leading to clinically significant impairment or distress manifesting in the following ways within a 12-month period: failure to fulfil major role obligations, use that is physically hazardous, recurrent substance-related legal problems and continued use despite persistent or recurrent social or interpersonal problems. Substance dependence, in contrast, is defined as a maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by three or more of the following over a 12-month period: tolerance, withdrawal, loss of control, preoccupation, adverse consequences and continued use despite adverse consequences (American Psychiatric Association, 1994).

Published prevalence studies in Australia comparing substance misuse rates among homosexual versus heterosexual populations are rare (Australian Institute of Health and Welfare, 2004; Darke, Baker, Dixon, Wodak & Heather, 1992; Darke, Hall & Carles, 1990). However, one study identified from Australia indicated that same-sex attraction among adolescents was associated with more frequent binge drinking and participants with same-sex attraction were three to four times more likely to have used injected drugs (Smith et al., 1999). Data from overseas have been primarily used to make comparisons about problematic

substance use. A 2003 study of homosexual and heterosexual men and women in Wales and England indicated that gay men used higher rates of recreational drugs in the previous month than heterosexual men, however there were no differences on measures of alcohol misuse or lifetime recreational drug use (King, McKeown, Warner, Ramsay, Johnson & Court, 2003). Among a large United States sample of heterosexual and homosexual adults, trends in substance use indicated that there were consistent patterns of elevated drug use in gay individuals for lifetime drug use, but these contrasts were greatly reduced for recent use (Cochran, Ackerman, Mays & Ross, 2004). According to Cochran and colleagues (2004) MSM were more likely to report use of marijuana, cocaine and heroin, and lesbians were more likely to report use of marijuana and analgesics than individuals reporting only opposite-sex partners. Furthermore, both homosexually active men and women were more likely than exclusively heterosexually active participants to report at least one symptom of dysfunctional drug use across all drug classes and to meet criteria for marijuana dependence syndrome (Cochran et al., 2004). Because some MSM who have substance abuse problems are at an increased risk of sexual risk-taking (Paul, Stall & Davis, 1993; Stall, McKusick, Wiley, Coates & Ostrow, 1986), treatment of substance-related disorders may be another strategy for reducing sexual risk-taking among this population (Frosch, Shoptaw, Huber, Rawson & Ling, 1996; Silvestre, Lyter, Valdiserri, Huggins & Rinaldo, 1989).

### **Section 3: Historical, cultural and societal factors and contexts of substance use**

Gay and bisexual men often experience unique challenges related to discrimination and stigma (Herdt, 1997). It is well established that some of the most powerful institutions in society have historically rejected homosexuality, including various religions, health systems and the media (Finnegan & Cook, 1984). For example, homosexuality had been classified as an illness in the diagnostic manual of the American Psychiatric Association until 1973 (Meyer, 2003). These strong societal forces can significantly impact upon the identity development processes that occur amongst gay men and lesbians. Gay men may face a number of specific difficulties including social rejection and rejection from their families (Barrett, Bolan, Joy, Counts, Doll & Harrison, 1995). D'Augelli (1991) has identified four primary concerns amongst young gay university men: dealing with parents regarding sexual orientation, relationship problems, worry about AIDS, and anxiety and depression.

These factors can negatively impact upon psychological well being and pose a significant risk for ongoing psychological problems. For example, the negative attitudes and feelings towards homosexuality that many gay and lesbian individuals hold against themselves are related to depression (Meyer, 1995), eating disorders (Brown, 1986), suicide (Rofes, 1983), alcoholism (Cabaj, 2000; Finnegan & Cook, 1984) and substance abuse (Cabaj, 2000; Glaus, 1988). Stereotypes about a particular group, such as homosexuals, can become very hazardous when they are internalized (McLean & Link, 1994). Thus, internalised homophobia (Huebner, Davis, Nemeroff & Aiken, 2002) is a construct that describes the taking on of societal sentiments that reject homosexuality by gay and lesbian people. Individuals can often internalize the idealized values learned from society and culture and, when these fail to match reality, internal conflict can result (Pearlin, 1993). Like individuals in the general population, MSM may use substances to help cope with such stressors (Myers et al., 1992; Young, Oei & Knight, 1990).

The complex (and sometimes controversial) relationships that have been postulated between gay men and substance use are well documented. For example, homosexuality has been deemed a *cause* of alcoholism (Israelstam & Lambert, 1983), however this view is not commonly held. More commonly the hypothesis is held that functions of substance use amongst this population may help gay men to manage and cope with the specific issues they face (Cabaj, 2000). Substance use among gay men and lesbians is related to poor self-image, stress reduction and coping with issues of sexual identity (see Myers, Rowe, Tudiver, Kurtz, Jackson & Orr, 1992). Less information or affiliation with the gay community and lower self-esteem has also been shown to be associated with increased alcohol or other drug use (Finnegan & Cook, 1984; Glaus, 1988, Meyer & Dean, 1995).

Alcohol and other substance use have been historically embedded within specific contexts within gay subculture (Greenwood, White, Page-Shafer, Bein, Osmond, Paul & Stall 2001; Lewis & Ross, 1995). Bars and night clubs have been some of the central places where gay men and lesbians have felt free to socialise together without fear of stigmatisation by wider society (Bell & Weinberg, 1978). Substance use has been commonly paired with certain sexual behaviours or settings, resulting in state-dependent learning<sup>4</sup> (Ostrow, 1996). Substance

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<sup>4</sup> The term “state-dependent learning” refers to the paired associations between substance use and sexual activity, whereby substance use can be a trigger for subsequent sexual risk taking and vice versa (Ostrow, 1996).

use has also been intimately linked with specific behaviours, such as attendance at dances parties (e.g., raves, circuit parties; Lee, Galanter, Dermatis & McDowell, 2003; Lewis & Ross, 1995; Ross, Mattison & Franklin, 2003) and use during sexual contact (Halkitis & Parsons, 2002; Semple, Patterson & Grant; 2002). Sexual risk taking and history of substance use amongst this group have also been linked with attendance at sex on premises venues (Binson, Woods, Pollack, Paul, Stall & Catania, 2001; Halkitis & Parsons, 2002). Amyl nitrate is used almost exclusively during sexual contact among gay and bisexual men or at dance parties to heighten sensation (French & Power, 1997). Gorman and colleagues (1997) noted that gay and bisexual men perceive “intense associations between methamphetamine use and sexual behaviour” (p. 109). Amongst gay and bisexual men poly-drug use (use of more than one substance in combination or sequentially) is also common. For example, nitrites are used in association with other substances (e.g., Ecstasy, amphetamines, LSD) to heighten the effects of other drugs or to prolong desired effects (French & Power, 1997). More recently, Sildenafil (Viagra) has been used with other substances to heighten sexual experiences and to improve sexual functioning (Aldridge & Measham, 1999).

Various studies from within Australia lend further support for contextual associations between substance use and MSM (Darke et al., 1995; Knox et al., 1999; Mullens et al., 2005; Slavin, 2004b). Darke and colleagues (1995) suggested that, among a sample of heterosexual and homosexual amphetamine using participants, substance use was intimately linked with social networks. In another study of non-prescription drug using gay men in three major Australian cities, researchers suggested that injecting drug use is embedded within a subculture of HIV-positive people however some participants reported use occurring outside of gay community contexts (Knox et al., 1999). A recent qualitative study of gay and bisexual men in Brisbane has revealed MSM hold specific ideas about the contextual factors surrounding their substance use (Mullens et al., 2005). MSM commonly linked their substance use to particular environments, including social and sexual contexts (Mullens et al., 2005). Slavin (2004c) provides further support regarding the use of crystal methamphetamine among gay men in Australia in particular social (e.g., dance parties, with friends) and/or sexual contexts.

#### **Section 4: Relationships between substance use and sexual activity/risk-taking**

Historically and anecdotally substance use has been linked with sexual risk-taking, both, among the general population and among MSM. Extensive research efforts have been invested into this area, in part due to public health implications and the recent increases in rates of new diagnoses of HIV (Queensland Health, 2003). Research in this area has been both complex and inconsistent. However, numerous studies have indicated that substance use is a risk factor for unprotected sexual activity (Chesney, Barrett & Stall, 1998; Stall et al., 1986), while some studies have not (Myers et al., 1992; Weatherburn, Davies, Hickson, Hunt, McManus & Coxon, 1992). Use of HIV seroconversion data has also supported relationships between substance use and sexual risk-taking (Silvestre et al., 1989; Wiebel, Jimenez, Johnson, Oullet, Jovanovic & Lampinen, 1996). Leigh and Stall (1993) have noted, “Both sex and substance use are complicated behaviours, and determining the nature of the relationship between them is not simple” (p. 1041).

Research in this area has been categorised into three main types: 1) global association studies; 2) situational association studies; and 3) event analyses (Leigh & Stall, 1993). Global association studies refer to the measurement of overall levels of substance use and risky sexual practices, while situational studies consider patterns of substance use in conjunction with sexual activity. Event analyses, however, explore the circumstances (e.g., substance use) surrounding a particular or discrete sexual encounter. Each of these approaches has methodological limitations. Global association studies are not able to establish a causal effect and only general substance use is measured, which is not assessed in relation to sexual practices. Situational association studies are also not able to ascertain causality and event analyses may not represent typical sexual practices of the individual.

Global and situational studies have tended to show a positive relationship between substance use and sexual risk-taking, while event analyses have not—suggesting that other factors may be important in mediating these relationships. Other suggested factors include sensation seeking personality characteristics (Crawford, Hammack, McKirnan, Ostrow, Zamboni & Roobinson, 2003; Dolezal, Meyer-Bahlburg, Remien & Petkova, 1997; Kalichman, Heckman & Kelly, 1996; Molitor, Truax, Ruiz & Sun, 1998) and substance-related

expectancies<sup>5</sup> (Hull & Young, 1983; Kalichman, Tannenbaum & Nachimson, 1998; Leigh & Stall, 1993; McKirnan & Peterson, 1989; Ostrow, 1996; Weinhardt, Ooto-Salaj, Brondino, Norberg & Kalichman, 2002). Also referred to as “desire for excitement” (Gold, Skinner, Grant & Plummer, 1991), risk-taking or sensation-seeking is a personality disposition that is defined as a tendency to prefer exciting, optimal and novel stimulation or arousal (Kalichman, Adiar, Rompa, Multhauf, Johnson & Kelly, 1994). Individuals with risk-taking personality features are at increased likelihood of engaging in a variety of risk-taking activities including unprotected sex. However, research into personality features suggests that risk-taking personality features may be more resistant to intervention and change than other factors that may contribute to sexual risk-taking (Dolezal et al., 1997).

Expectancies, or the beliefs individuals hold about the consequences of their substance use, have been hypothesized as another key variable that may mediate the relationship between substance use and sexual risk-taking (Hull & Young, 1983; LaBrie, Schiffman & Earleywine, 2002; Kalichman et al., 1998; McKirnan & Peterson, 1989; Ostrow, 1996). According to this theory, individuals who believe that substance use will result in particular consequences (e.g., heightened arousal, increased sexual adventurousness) are more likely to have these consequences occur, which may in turn make sexual risk-taking more likely. For example, LaBrie and colleagues (2002) found that college students who believed that alcohol use negatively impacted upon condom use were more likely to use greater amounts of alcohol and were less likely to use condoms. Interventions can, thus, be designed to modify these beliefs and to increase self-efficacy regarding condom use. Ostrow (1996) has further suggested that expectations about the effects of a given substance, as well as the context in which people learn how to use a drug, may significantly impact upon whether or not a particular drug is used during a sexual encounter.

Some of the potential causal mechanisms that have been suggested to explain the relationships between sexual risk-taking and substance use include: pharmacological effects, behavioural disinhibition and biological interactions (Ostrow, 1994; 1996). Pharmacological effects refer to enhanced sexual performance and sexual experiences and have been associated with use of alcohol (Critchlow, 1986; George & Stoner, 2000; Parsons, Vicioso, Punzalan,

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<sup>5</sup> “Expectancies” refer to an individual’s beliefs about the consequences or effects of a given action, which are related to personal experiences, vicarious experiences or an acquired concept about appropriate behaviour

Halkitis, Kutnick & Velasquez, 2004), amphetamines (Guss, 2000; Slavin, 2004a) and amyl nitrate (French & Power, 1997; Lange et al., 1988). Substance use may facilitate certain sexual practices that are perceived as desirable, such as prolonged sexual energy and engaging in more sexually adventurous or esoteric practices (Kippax et al., 1998). Guss (2002) illustrates this concept in regard to stimulant use among MSM:

*When sex is added to the stimulant experience, its meaning and value are heightened or transformed. If a sexual experience is combined with...cocaine or crystal methamphetamine, powerful and reciprocally enhancing experiences occur.* (p. 108)

Likewise, amyl nitrate is commonly used exclusively for the purpose of enhancing sexual encounters (Lange et al., 1988). Others have suggested that disinhibition is responsible for a variety of risk taking consequences, including unprotected anal intercourse (Cooper, 1989; Kelly, St. Lawrence & Brasfield, 1991). Several biological interaction hypotheses also exist regarding the role of substance use in sexual risk-taking and HIV transmission. Some researchers suggest that use of amyl nitrate or cocaine relaxes anal sphincter muscles that may allow for prolonged and/or more painful intercourse, resulting in increased bleeding that can make HIV transmission more likely (Seage, Mayer, Horsburgh, Holmberg, Moon & Lamb, 1992). Others have suggested that chronic substance use can result in immunosuppression, which may increase the likelihood of seroconversion among HIV-negative individuals (Dax, Adler, Nagel, Lange & Jaffe, 1991).

A variety of additional theories have been posited to explain the relationships between substance use and sexual risk-taking such as self-handicapping, tension reduction, alcohol myopia and cognitive distancing/disengagement hypotheses. Self-handicapping is defined as any action that enhances the opportunities to externalize failure and to internalize success (Berglas & Iones, 1978; Tucker, Vuchinich, & Sobell, 1981). Thus, individuals may actively use substances as a tool to justify or rationalise behaviours. Tension reduction hypotheses suggest that individuals use alcohol or other substances to help decrease stress or to help manage anxiety (Myers et al., 1992; Stall & Purcell, 2000; Wells & Kline, 1987; Young et al., 1990). Alcohol myopia theories suggest that alcohol use may heighten shorter-term motives, such as sexual arousal versus longer-term implications of behaviour including HIV transmission (Steele & Josephs, 1990). Cognitive distancing or disengagement strategies

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(Weinhardt, Otto-Salaj, Brondino, Norberg & Kalichman, 2002).

suggest that substance use may help the individual “escape” from fears about HIV and may result in reduced motivation to practice safer-sex norms regarding behaviour (Crawford et al., 2003; McKirnan, Ostrow & Hope, 1996; Ostrow, 1996). Each of these hypotheses implies the somewhat functional and/or strategic use of substances.

A recent qualitative study has further examined the meanings and functions of substance use among a Brisbane sample of MSM (Mullens et al., 2005). Results from this study indicated the following consequences of substance use: (i) altered cognitive functioning; (ii) impact on social interactions; (iii) impact on sexual behaviour; (iv) altered mood state; (v) impact on sexual safety; (vi) effects on the body; (vii); disinhibition; (viii) changes to sexual arousal; (ix) impact on the sexual experience; (x) relaxation effects; (xi) heightened sensation; (xii) impact on energy/activity level; and (xiii) numbing effects (Mullens et al., 2005). Preliminary conclusions suggest that sexual risk operates along a continuum and that substance use may impact upon various aspects leading up to a potential sexual encounter (e.g., likelihood of attending a beat, increased confidence to speak to someone, disinhibition regarding instigating sexual contact, impaired communication/negotiation abilities, increased sexual arousal). Thus, interventions should be designed to influence a range of aspects, which may lead to a potential sexual encounter.

Beyond substance use, various situational variables have also been associated with increased sexual risk-taking. A study of 470 gay men indicated that the following factors were associated with “lapses” of unsafe sex: affectionate feelings, desire to please sexual partner, spontaneity of encounter, sex occurring outside of monogamous relationship and unknown HIV status of the sexual partner (Kelly, Kalichman, Kauth, Kilgore, Hood & Campos, 1991). Gold and colleagues (1991; 1992) have suggested that the following situational factors and thought processes increase the likelihood of unprotected sexual encounters among MSM in Australia: negative mood state prior to sex, inferring that the sexual partner was probably not HIV positive and planning to have sex without ejaculation. Others have suggested that the increased reinforcement value of having sex without a condom (i.e., sex feeling better without a condom) was a better predictor of not using a condom than other factors such as knowledge, behaviour change intentions, perceived vulnerability, condom attitudes and sexual communication skills (Kelly & Kalichman, 1998).

Overall, there is an association between substance use and sexual risk-taking, which appears to operate via a variety of direct and indirect mechanisms. Several models, hypotheses and modes of investigation have been used to explore these relationships. One conclusion that can be drawn is that it is probably *a combination of factors* that influences the relationships between substance use and sexual risk-taking among MSM. According to Ostrow (1996), “The direct effects of drugs must be seen as a combination of their pharmacological properties, plus learned expectancies and stress-dampening effects” (p. 2). Some other key factors that deserve further attention are context of use, functional aspects of substance use, normative beliefs about substance use and stressors associated with gay identity that may impact upon substance use. Future research in this area must extend beyond the quantification of substance use and the social and medical problems that MSM experience in connection with substance use and focus on qualitative approaches to help generate additional hypotheses regarding the complex relationships between substance use and sexual risk-taking amongst this population (Leigh & Stall, 1993).

### **Section 5: Summary of health promotion/HIV transmission prevention issues**

The following section provides a review of prevention issues and published literature in Australia and overseas regarding general and substance-related health promotion/HIV prevention projects as well as suggestions for future efforts. This section is intended to be integrated with information regarding other regional and national health promotion projects in guiding the development and implementation of the upcoming health promotion campaign.

#### *Intervention types*

A variety of different formats have been used to promote healthier behaviours (e.g., condom use) among various groups. The most common approaches are discussed below (University of Texas Southwestern Medical Center, n.d.).

Community: seeks to change attitudes, norms and values, as well as the social and environmental context of risk behaviours of an entire community/target population. This often includes use of the media (e.g., television, print advertising, brochures, posters). These types of interventions also often involve community members in their development (Holtgrave, Qualls, Curran, Valdiserri, Guinan & Parra, 1995).

*Group:* seeks to change individual behaviour within the context of a group setting. These types of interventions are commonly lead by peers and/or health professionals. For example, participants might attend several weekly sessions focussed on problem-solving and skill development regarding condom use (Ostrow, 2000).

*Individual:* seeks to change individual behaviour through the use of one-to-one dynamics carried out in one or more individual sessions. Individual sessions can incorporate both education and counselling and may be delivered within the context of HIV testing (Holtgrave et al., 1995).

Other opportunities for intervention include HIV testing, outreach programs, drug treatment services and needle exchange programs. A number of community based intervention programs aim to combine media, small-group, and individual counselling approaches targeted to substance using gay men (Ostrow et al 1993). Appendix B provides a comprehensive review of findings regarding effective HIV prevention and health promotion interventions focussed on safer sexual practices with a range of populations (United States Centers for Disease Control Compendium & Connecticut's HIV Prevention Community Planning Group, n.d.).

#### *Target groups*

It is important to consider the target group when developing any health promotion interventions. In the case of substance use and sexual risk-taking it is important to consider which individuals or groups may be at greatest risk of substance-related issues, including combining substance use with sexual activity (Stall, 1988). Some of the most commonly targeted groups for health promotion in this area include: MSM, people living with HIV/AIDS (PLWHA), individuals with substance misuse problems, intravenous drug users, adolescents, sex workers, people from culturally and linguistically diverse backgrounds, heterosexuals and MSM who do not identify as being gay. Innovative strategies are needed to access hard-to-reach groups (O'Reilly & Higgins, 1991).

#### *Health promotion—General*

Interventions are commonly based on a variety of social-cognitive theories and respective models (e.g., health belief model, stages of change) and allow for further theoretical development and greater ease of comparison with other studies. Most health promotion interventions for MSM focus on modifying risky behaviours and several have been shown to

be effective (Honnen & Kleinke, 1990; Kelly, St. Lawrence, Betts, Brasfield & Hood, 1990). Interventions commonly include modifying factors such as attitudes, skills, beliefs, knowledge and norms. Some researchers have suggested that interventions which strive to enhance information, motivation and behavioural skills (e.g., self-acceptance of sexuality, acquiring HIV-relevant knowledge, negotiation, condom purchasing, HIV testing) regarding condom use show the greatest levels of effectiveness (Fisher & Fisher, 1992).

According to Johnson and colleagues (2003), in a comprehensive review of 13 published intervention studies, community level interventions were just as effective as group interventions in improving condom use and the authors noted that these interventions worked via, both, direct exposure to the formal intervention and through informal social diffusion processes. Overall, the reviewed intervention studies reduced the occurrence of unprotected anal intercourse by 23% among MSM (Johnson, Hodges & Diaz, 2003). Some researchers have cautioned that interventions which bring together small groups of MSM recruited through sexual health clinics may have the potential to reduce unprotected anal intercourse, but may also have the potential to introduce new sexual partners possibly increasing rates of sexual contact and secondary transmission among individuals who may already be at increased risk (Imrie, Stephenson, Cowan, Wanigaratne, Billington & Copas 2001). Holtgrave and colleagues (1995) have cited the following as characteristics of effective HIV prevention programs: 1) basis in the real and specific needs of the community and community involvement; 2) cultural appropriateness; 3) clearly defined audiences, objectives, and interventions; 4) basis in behavioural and social science theory and research; 5) quality monitoring and adherence to plans; 6) use of evaluation findings and mid-course corrections; and 7) sufficient resources. These authors further suggest that HIV prevention efforts need only small favourable improvements in behaviour for the program's economic benefits to outweigh the program costs (Holtgrave et al., 1995).

#### *Health promotion—Sexual activity and substance use*

Stall (1988) has provided the following guidelines for developing campaigns specifically targeted to reducing sexual risk-taking among individuals who combine substance use and sexual activity:

- 1) Develop specialised health education campaigns focussed on those who are at increased risk of combining substance use with sexual activity;

- 2) Determine the social characteristics of those who are most likely to combine substance use and sexual activity and develop specialised health education for these groups;
- 3) Consider the social contexts of substance use and sexual activity. For example, interventions may include further involvement with gay bars or sex on premises venues to increase condom availability at these sites or provide additional training to bar staff to enhance their ability to not serve intoxicated patrons; and
- 4) Actively work to develop other settings in the community for MSM to meet and socialise—beyond contexts that specifically focus on substance use and/or sexual activity.

There is evidence to suggest that interventions can reduce both sexual risk-taking and substance use among MSM. However, in 2000 there were only eight published English-language individual or group intervention studies that specifically included drug-using MSM (Ostrow, 2000; See Appendix C) and published evaluations of community level interventions targeting substance use and sexual activity are rare. An analysis of the identified intervention studies revealed moderate to substantial improvements in drug-associated sexual behaviours across all interventions trialed. The interventions were varied and included a variety of approaches including problem-solving, skill development and counselling. Ostrow (2000) concluded that more well-evaluated interventions are needed and must be guided by established theories. Further developments in substance abuse treatment for this population may also have important implications as an HIV prevention strategy (Deas, Randall & Roberts, 2000; Shoptaw & Frosch, 2000; Shoptaw, Frosch, Rawson & Ling, 1997), and could incorporate forging stronger links with alcohol and drug treatment services as well as increasing education about sexuality issues and substance use amongst workers in this field.

#### *Future health promotion efforts*

Researchers have proposed a variety of recommendations to increase the effectiveness and efficacy of future HIV prevention and health promotion efforts. Seal (2003) suggests that HIV prevention programmes are more likely to be successful if they focus on broader issues than solely that of safer sex promotion and include other factors that are relevant to the target community. A qualitative study revealed several topics that young MSM (aged 16-25 years) believed were important to be incorporated into future HIV prevention campaigns: 1) dating

and intimacy, 2) sexuality and arousal, 3) drugs and alcohol, 4) self-esteem and self-worth, 5) abuse and coercion, and 6) sexual identity (Seal et al., 2000). In terms of drug and alcohol issues, the authors suggested the need for safer sex planning strategies that people could enact prior to drinking or using drugs (Seal et al., 2000, p. 12). Researchers and clinicians caution that health promotion messages regarding substance abuse and sexual activity must be framed carefully as to avoid individuals perceiving that substance use can serve as an excuse or justification for high risk behaviour (Leigh & Stall, 1993).

It has also been suggested that substance-related interventions for MSM must first identify and deal with the underlying causes of increased vulnerability (to substance use or risky sexual practices), such as low self-esteem and lack of access to community resources, before community norm changing and cognitive skill building can be viable intervention strategies for behaviour change (Ostrow, 1994). Others have made similar recommendations and have stressed the need to extend interventions beyond cognitive-behavioural processes and norms and focus more on MSM who may be at increased risk, such as those with risk-taking personality characteristics, poor coping skills or low self-efficacy concerning HIV-related risk reduction (McKirnan et al., 1996). Ostrow (1994) provides the following comprehensive recommendations regarding what is needed for future health promotion efforts in this the area:

*Useful interventions aimed at decoupling substance use and sexual activity might include creating “safe” settings where behavioural skills and community-norm changing practices can be explained. Since sensation seeking, state-dependent learning, expectations about drug use, and specific coping skills deficits make men vulnerable to sexual behaviour relapse in the context of drug use, individual or small group interventions that assist men in restructuring their ways of dealing with stress may play an important role. In addition, interventions need to assist drug-involved men to more effectively cope with HIV-specific stress and negative affect, to become aware of their expectations regarding substance use effects, and to maintain self-awareness about their situations. (p. 3)*

It is evident that the relationships between substance use and sexual risk-taking are complex and can vary considerably among individuals. Multi-faceted approaches are needed to address these issues and health promotion efforts must focus on a variety of aspects, both, within and beyond the topics of substance use and sexual activity. Some of these strategies

may include increased understanding of why individuals use substances, contexts of substance use, individual beliefs about the consequences of substance use, skill building, treatment of substance misuse, harm minimisation strategies and changing community norms. Ultimately, due to limitations in medical advances (i.e., no available vaccine or “cure”), prevention still remains the best and only approach to health promotion in this area and reducing HIV transmission (Kowalewski, Henson & Longshore, 1997).

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