



**Australian Government**  
**Department of Health and Ageing**

# National Amphetamine-Type Stimulant Strategy Background Paper

*National  
Drug Strategy*



National Amphetamine-Type  
Stimulant Strategy  
Background Paper

Report prepared for the Department of Health and Ageing

by

National Drug Research Institute  
Australian Institute of Criminology

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## Disclaimer

This research paper does not necessarily reflect the policy position of the Australian Commonwealth Government.

## Abbreviations

ABS	Australian Bureau of Statistics
ACC	Australian Crime Commission
ACON	AIDS Council of New South Wales
ACT	Australian Capital Territory
AFP	Australian Federal Police
AIC	Australian Institute of Criminology
AIHW	Australian Institute of Health and Welfare
ANCD	Australian National Council on Drugs
AOSD	Amphetamine and Other Synthetic Drugs
ASSAD	Australian Secondary Students' Alcohol and Drug Survey
ATS	Amphetamine-type stimulants
BOCSAR	Bureau of Crime Statistics and Research
COAG	Council of Australian Governments
DUCO	Drug Use Careers of Offenders
DUMA	Drug Use Monitoring in Australia
EDRS	Ecstasy and Related Drugs Reporting System
GLBT	Gay, lesbian, bisexual and transgender
HIV	Human immunodeficiency virus
IDDI	Illicit Drug Diversion Initiative
IDRS	Illicit Drug Reporting System
IDU	Injecting Drug Users
IGCD	Intergovernmental Committee on Drugs
MCDS	Ministerial Council on Drug Strategy
MDMA	Methylenedioxymethamphetamine
NAPID	National Action Plan on Illicit Drugs
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NCADA	National Campaign Against Drug Abuse
NDARC	National Drug and Alcohol Research Centre
NDLERF	National Drug Law Enforcement Research Fund
NDRI	National Drug Research Institute
NDS	National Drug Strategy
NDSHS	National Drug Strategy Household Survey
NMDS	National Minimum Data Set
NSW	New South Wales
NT	Northern Territory
PDI	Party Drugs Initiative
REU	Regular ecstasy users
SA	South Australia
WA	Western Australia

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# Chapter 1: Introduction

## 1.1 Background to the National Amphetamine-Type Stimulant Strategy

The National Drug Strategy (NDS) and its forerunner, the National Campaign Against Drug Abuse (NCADA), have provided the national policy framework on drugs since 1985. The NDS is the responsibility of the Ministerial Council on Drug Strategy (MCDS). The MCDS is the peak policy and decision making body on licit and illicit drugs in Australia, and is responsible for developing policies and programs to reduce the demand, supply and harm associated with drugs and their impact on individuals, families and communities in Australia. It brings together Australian Government, State and Territory Ministers responsible for health and law enforcement, and the Australian Government Minister responsible for education.

The MCDS liaises with, and provide reports to, the Australasian Police Ministers' Council, the Australian Health Ministers' Council, the Ministerial Council on Employment, Education, Training and Youth Affairs, the Ministerial Council for Aboriginal and Torres Strait Islander Affairs and other ministerial councils on matters of joint responsibility and priority in relation to the NDS. The MCDS is supported in its role by an advisory structure which includes the Intergovernmental Committee on Drugs (IGCD) and the Australian National Council on Drugs (ANCD) as principal bodies responsible for the provision of advice to the MCDS on the development and implementation of policies and programs.

In May 2004, the *National Drug Strategy: Australia's Integrated Framework 2004-2009* was endorsed by the MCDS (Ministerial Council on Drug Strategy, 2004). A key outcome from the framework has been the development of a set of strategy documents focused on individual drugs which are designed to ensure a consistent approach to the reduction in supply, demand and associated harms.

Australia's NDS aims to reduce drug-related harm and improve health, social and economic outcomes for both the individual and the community. It includes a wide range of approaches and encourages a balance between demand reduction, supply reduction and harm reduction strategies. For example, it encompasses:

- supply reduction strategies to disrupt the production and supply of illicit drugs, and the control and regulation of licit substances;
- demand reduction strategies to prevent the uptake of harmful drug use, including abstinence orientated strategies and treatment to reduce drug use; and
- harm reduction strategies to reduce drug-related harm to individuals and communities.

Individual jurisdictions and non-government organisations continue to develop plans and strategies that reflect the key elements of the NDS, and report annually on implementation of programs, activities and initiatives. A number of participants in the community consultations asked that there be consistency in the development of the strategy in terms of applying the NDS principles outlined above and that the National Amphetamine-type Stimulant (ATS) Strategy be linked to two other national strategies that have been developed for alcohol and cannabis.

The NDS framework and the Law Enforcement Component of the National ATS Strategy provided the framework and starting point for determining the important issues in relation to ATS. Existing national strategies and action plans such as the National Action Plan on Illicit Drugs (NAPID) 2001 to 2002-03 and the Aboriginal and Torres Strait Islander Complementary Action Plan 2003-2006, were also drawn upon. NAPID identified seven key areas that are also the focus of this report:

- demand reduction: promotion of opportunities, settings, and values that promote resilience and reduce the uptake and use of drugs and the risks of drug use;
- supply reduction: interventions to reduce availability and supply;
- treatment;
- harm reduction;
- workforce development;
- research; and
- monitoring illicit drug trends.

Other key sources of information were the National Leadership Forum on Ice (2006) held in Sydney and the recent Australian National Council on Drugs (2007) position paper on methamphetamine. In addition to an extensive review of the literature and research to date, consultations were undertaken in every jurisdiction of Australia in capital cities and regional areas between March and June 2007 (see Appendix 1). Community members and representatives from a range of sectors were invited to attend the forums and attendees had the opportunity to express views on issues for consideration in developing the Strategy. Participants included drug and alcohol workers, criminal justice workers, police, government representatives, researchers, educators, Indigenous representatives, consumer groups, health professionals, and other relevant stakeholders. Specific forums for canvassing the views of consumers, young people, and Indigenous community members were also held.

Written submissions to inform development of the National ATS Strategy were sought using several approaches. First, participants at the consultation forums were invited to make submissions and encouraged to inform colleagues of the opportunity. Second, formal invitations to make a written submission were sent to 107 organisations across Australia, including peak community bodies, health services, law enforcement, justice system, and non-government organisations. This list was generated from those invited to make submissions as part of development of the National Cannabis Strategy and updated to include agencies that might have an interest or involvement in responding to ATS problems. Third, the Australian Government Department of Health and Ageing placed an advertisement in a key newspaper in each State and Territory, inviting written submissions. Fourth, details of how to make a written submission were posted on the National Drug Research Institute (NDRI) website and on the list server of the Alcohol and Drug Council of Australia (ADCA). A total of 22 written submissions were received (see Appendix 2).

## 1.2 Defining amphetamine-type stimulants

The generic term amphetamine-type stimulants is commonly used to refer to a family of synthetic drugs that are chemically related to the parent compound amphetamine (phenylisopropylamine) (Dyer & Cruickshank, 2005). Also referred to as 'psychostimulants', they are distinguishable from 'botanical' psychoactive drugs (e.g., heroin, cocaine, cannabis), which are derived from plants (Chawla, 1998). Amphetamines act as central nervous system stimulants, which increase synaptic concentrations of monoamine neurotransmitters in the brain, namely, dopamine, serotonin and noradrenaline (Rothman & Baumann, 2003).

Amphetamine and methamphetamine may also be identified by the chemical terms 1-phenylpropan-2-amine and N-methyl-1-phenyl-propan-2-amine, respectively (International Union of Pure and Applied Chemistry, 1993). Methamphetamine (methyl- $\beta$ -phenylisopropylamine) is structurally similar to amphetamine, but is more potent in that it has proportionally greater central stimulatory effect as well as stronger subjective effects (Degenhardt & Topp, 2003). Crystal methamphetamine, commonly referred to as 'ice', is methamphetamine of high purity and manufactured like any other form of methamphetamine, except for an additional step of refinement, known as the 'conversion process'. Phenethylamines include MDMA (3,4-methylenedioxymethamphetamine), commonly referred to as ecstasy, and MDA (3,4-methylenedioxyamphetamine), which are structurally similar to amphetamine, but produced by a different chemical process (Kalant, 2001). Table 1.1 provides an overview of common illicit ATS, their street names and routes of administration.

In its report on the manufacture, importation and use of amphetamine and other synthetic drugs (AOSD), the Parliamentary Joint Committee on the Australian Crime Commission (2007) commented on the definitions of these drugs contained in the submissions it received. The Australian Federal Police (AFP) stated in their submission that AOSD is a term used by the ACC to incorporate synthetically manufactured illicit drugs and their precursors. On an international level, ATS is the term used to describe this group of drugs. In the interests of international consistency, the AFP continues to use the term ATS and reports separately on ATS and MDMA seizures. The Parliamentary Joint Committee (2007) noted that:

the ambiguity over what is or is not included in the term ATS could lead to confusion for researchers, law enforcement and community support organisations. The Committee recommends the Australian Government and its agencies standardise their use of a descriptor for this class of illicit drugs and clarify what is included in the term selected (p.6).

Table 1.1: Amphetamine-type stimulants commonly used in Australia

Drug type	Common names	Forms	Route of administration
Amphetamine, dexamphetamines	Speed, whiz, uppers, goey, dexies, pep pills	White, yellow, pink or brown powder or tablets	Oral, intranasal, injection, anal
Methamphetamine	Meth, speed, whiz, fast, uppers, goey, louee, Lou Reed, rabbit tail, pep pills; in paste form can be referred to as base, pure, point or wax; in liquid form can be referred to as leopard's blood, ox blood, red speed or liquid red	White, yellow or brown powder, paste, tablets or a red liquid	Oral, intranasal, injection, anal
Crystalline methamphetamine hydrochloride (D-methamphetamine)—purified methamphetamine	Ice, meth, d-meth, glass, crystal, batu, shabu (from the Philippines)	Crystal—resembles crushed ice	Smoking, intranasal, injection
3,4-methylenedioxyamphetamine (MDMA)	XTC, X, Ecstasy, Adam, M & M, eccy, E, Go, Scooby Snacks, hug, bea	Tablet, gel tab, powder	Oral, intranasal, smoking, injecting

- Dexamphetamine (also known as dextroamphetamine sulphate) is sold in tablet form in Australia for ADHD and narcolepsy, in accordance with state and territory laws. It is also used illicitly.
- In tablet form, the drug can be inserted into the anus or the vagina to avoid the irritation to the user's stomach which commonly occurs when taken orally (also known as 'shafting' or 'shelving').
- Terminology noted in Queensland.

Source: Australian Forensic Drug Laboratory, South Australia Forensic Science Centre.

MDMA is chemically related to the amphetamine module, but has different pharmacological properties in that it not only stimulates the central nervous system, but also has hallucinogenic and/or entactogenic effects (United Nations Drug Control Programme, 1996). Consequently, MDMA may be classified as a stimulant or a hallucinogen or an entactogen. MDMA is included in official statistics as an ATS, particularly seizure and arrest data, and these sources often do not distinguish between amphetamine and MDMA. On this basis, MDMA is included as an ATS for the purposes of this background paper.

The general misunderstanding and confusion about the various terms that are used to describe ATS was raised in the submission received from Turning Point Drug and Alcohol and Drug Centre in Melbourne:

There needs to be a definitive statement that covers terminology and description of the mechanisms of action of ATS. The terminology should take into account use of terms that are primarily clinical and those that are primarily used in the justice system. We do not believe that each sector needs to use exactly the same terms as the terms serve different purposes in the different sectors (e.g., the term ATS is generally used among

justice and frontline workers and the term amphetamines is more commonly used among health workers) but each sector needs to understand the terms used in other sectors and why they might be different to those used in their own sector. An organization or consortium could be charged with Australia wide consultation among the sectors with an interest in this area to develop a consensus on terminology that would be used both at the state and federal level when talking about ATS.

In addition to illicit ATS, there are several licit stimulants such as dextroamphetamine and methylphenidate, and phentermine based diet pills, such as duromine. Licit ATS are used primarily in medications to treat attention deficit hyperactivity disorder (ADHD) such as dexamphetamine and Ritalin; anorectics in the treatment of obesity, such as clobenzorex and dexfenfluramine; narcolepsy treatment such as modafinil; and in nasal inhalers, such as levomethamphetamine and propylhexedrine (United Nations Drug Control Programme, 1996). Given the potential misuse of these drugs in illicit markets and debate about their therapeutic value, these drugs are subject to ongoing review by medical, health and law enforcement authorities. At present, few studies have investigated prevalence and patterns of use associated with diversion of these drugs to illicit use, highlighting this as an area for future research.

### 1.3 History of amphetamine-type stimulants

The use of amphetamine has been documented for centuries in China, where the ma huang plant (*Ephedra vulgaris*) has been used to treat people with asthma (Tyler, 1986). The ma huang plant contains ephedrine which is a central nervous system stimulant first produced by chemical synthesis in 1887 in Germany (Tyler, 1986). Following this discovery, amphetamine came into medical and recreational use in the 1920s primarily through the treatment of colds and asthma. In 1932 the Benzedrine Inhaler was introduced as an over the counter product and became a licit substitute for cocaine which had been declared illegal by the US federal government in 1914 (Tyler, 1986). By 1940, thirty-nine disorders had been identified for which Benzedrine – one of the three main kinds of amphetamine – was the recommended treatment, including night blindness, sea sickness and impotence (Tyler, 1986).

Methamphetamine, more potent and easier to make than amphetamine, was discovered in Japan in 1919 (Bell, 2006). The crystalline powder was soluble in water, making it easy to inject. During World War II and the Vietnam War methamphetamine was widely used by the armed forces to increase alertness, confidence, feelings of increased strength and to suppress appetite. In the United States in the 1950s, legally manufactured tablets of both dextroamphetamine (Dexedrine) and methamphetamine (Methedrine) became readily available and were used by college students, truck drivers, and athletes. These drugs were often used as a substitute for cocaine, which had become illegal, and one of the primary reasons for use was to remain alert for extended periods of time.

By the 1960s the market in methamphetamine had changed from being predominantly licit to illicit. The black market consisted first of the diversion of supplies from pharmaceutical companies, chemists and doctors. This was followed by the synthesis, manufacture and distribution of methamphetamine by motor cycle and other criminal gangs and syndicates,

particularly on the Pacific Coast of the United States (Bell, 2006). The Australian experience of amphetamine use and supply largely followed that of the United States. As noted by Dillon (2000), MDMA use in Australia seems to date from as recently as the late 1970s. It was briefly used as a therapeutic drug in the early eighties by some psychiatrists for the treatment of post traumatic stress and as an aid to marital relationships, but was never a mainstream or widely used legitimate medication and declared illegal in 1989.

## 1.4 Forms of illicit amphetamine-type stimulants

### Meth/amphetamine

Until the late 1980s the form of amphetamine most available in Australia was amphetamine sulphate. During the 1990s, the proportion of ATS seizures that were methamphetamine (rather than amphetamine) steadily increased until methamphetamine dominated the market. Currently in Australia, the powder traditionally known as 'speed' is almost exclusively methamphetamine rather than amphetamine (Topp et al., 2002). Methamphetamine is available in a number of different forms as the result of different modes of production and levels of purity. Aside from more common forms of powder, base and crystal, methamphetamine sometimes used in the production of pills and in liquid form, referred to as 'oxblood' (Black et al., 2005). Variations in colour and texture occur because the purifying process involved in the manufacture of methamphetamine is complex and many manufacturers of the drug lack the relevant expertise. The result is a wide range of products at the end of the manufacturing process which look different and contain different impurities. As shown in Table 1.2, up until 2002 at least three types of meth/amphetamine could be viewed as distinct commodities:

- speed, or methamphetamine powder that is locally manufactured, generally of low purity, and is usually administered by snorting or injecting;
- base or paste, which is a gummy, pasty or oily kind of methamphetamine powder that is locally manufactured and often has a brown or yellow tinge due to the presence of iodine and other organic impurities; and
- crystal methamphetamine which is high purity, imported crystalline methamphetamine that comes in the form of large translucent to white crystals that are usually smoked or injected (Topp et al., 2002).

Table 1.2: Amphetamine types, forms and routes of administration

Common Name	Medical or Chemical Name	Other Street Names	Drug Action	Form	Route of Administration	Comments
Speed	Amphetamine (Sulphate) Dexamphetamine	Goey or Go-ee Whizz Dexies	Stimulant	Powder, tablet or capsule, liquid	Snorted, swallowed, injected	Speed is often used as a generic name for a 'family' of amphetamine drugs that have been synthesised from approximately the late 19th century. In general sens, the term amphetamines may also include 'party drugs' such as MDMA. More commonly, however, speed refers to the specific drug amphetamine sulphate and more recently it may also refer to methamphetamines and prescription drugs such as ephedrine and pseudoephedrine.
Meth	Methamphetamine or Methylamphetamine	Speed, Base	Stimulant	Powder, oil or paste (Base)	Snorted, swallowed, injected, smoked	
Crystal Meth	Methamphetamine Hydrochloride	Srystal, Ice, Shabu, Crank, Glass	Stimulant	Crystalline posder or crystals	Smoked, swallowed, injected, snorted	Scientist and pharmacists who use the term 'ice' may be referrinf to the chemical 4-methylaminorex. Street Ice however is almost exclusively a strong, high purity form of methamphetamine.

Source: Drug and Crime Prevention Committee (2004, p.28)

## MDMA, or ecstasy

Like amphetamine, MDMA and its related compounds are amines that can exist either as volatile free bases or as salts of various acids (Kalant, 2001). While the free bases are volatile, the salts are quite soluble in water and can therefore be administered intravenously, orally or by snorting the powder (Kalant, 2001). MDMA is typically prepared in tablet or pill form and stamped with a wide variety of symbols, as shown in Figure 1.1. The tablets contain MDMA in varying amounts combined with other substances such as meth/amphetamine and ketamine (a dissociative anesthetic), while some contain no MDMA, but chemicals such as MDA (3,4-methylenedioxyamphetamine), PMA (paramethoxyamphetamine), MDEA (3,4 Methylenedioxyethylamphetamine), or substances like caffeine or paracetamol (National Drug and Alcohol Research Centre 2003). When self-reported use of MDMA was compared with urinalysis results, 44% of police detainees tested positive for methamphetamine not MDMA (Mouzos et al., 2007).

Figure 1.1: MDMA (ecstasy) tablets



Source: Victorian Police

## 1.5 Australian data collections

Australia has a number of data collections that provide empirical data for evidence based research which can inform the making and implementation of drug policy in the areas of supply reduction, demand reduction, and harm reduction strategies. The collections fall into two categories; national statistical collections and specialised collections. National statistical collections derive from jurisdictions providing police data relating to offences/incidents and data from courts, corrections and treatment agencies, while specialised collections include national drug strategy surveys (Makkai, 1999). It is important to coordinate existing data sources. For example, in their written submission, Turning Point Alcohol and Drug Centre noted:

There are a number of regular monitoring and surveillance studies underway that produce data about the prevalence of ATS among the different groups ....A coordinated response to drawing this information together and a critical examination of the sources of information and the picture they produce on a regular basis would assist both frontline workers and health professionals to understand the monitoring data and translate it to effective practice. An organisation or consortium could be charged with reporting on the various sources of data and making it meaningful for practice.

Following is a brief overview of the collections referred to in the current paper, which represents some of the monitoring systems operating in Australia.

The National Drug Strategy Household Survey (NDSHS) is the main Australian source of data on alcohol, tobacco and illicit drug prevalence and consumption. It is conducted every two to three years by the Australian Institute of Health and Welfare (AIHW) with the most recent survey conducted in 2004.

Statistics on Drug Use in Australia is also produced by AIHW and provides a comprehensive summary of major drug use statistical collections, with references to sources of more detailed information. It also serves as the 'companion document' to the NDS. Data are provided on consumption and, to a lesser extent, drug-related behaviour for tobacco, alcohol, illicit drugs and pharmaceuticals.

The Australian Secondary School Students Alcohol and Drug Survey (ASSAD) is a survey of students' alcohol and drug use across Australia. It is conducted in secondary schools every three years with the most recent survey conducted in 2005.

The Illicit Drug Reporting System (IDRS) is an annual study conducted to monitor the use of illicit drugs and drug markets by a sentinel sample of injecting drug users (IDU). It is complemented by the Ecstasy and Related Drugs Reporting System (EDRS), formerly known as the Party Drugs Initiative (PDI), which is conducted with a sentinel sample of regular ecstasy users (REU). The surveys are conducted in the capital city of every state and territory in Australia, with approximately 100 users interviewed in each jurisdiction for each survey. The most recent surveys were conducted in 2006.

The Alcohol and Other Drug Treatment Services National Minimum Data Set (AODTS–NMDS) summarises data from Australian alcohol and drug treatment services.

The Drug Use Monitoring in Australia (DUMA) study is conducted by the Australian Institute of Criminology (AIC). Established in 1999, the DUMA program is a quarterly collection of information from police detainees in nine sites (police stations or watchhouses) across Australia. The results are published annually.

The Illicit Drug Data Report (IDDR) is produced by the Australian Crime Commission (ACC) each financial year. It includes information on drug offences, price and purity of a range of illicit drugs including heroin, cocaine, amphetamine-type stimulants, ecstasy, cannabis, hallucinogens and steroids.

Drug Use Careers of Offenders (DUCO) was a survey of the illegal drug use and criminal careers of persons incarcerated in prisons in Queensland, Western Australia, Tasmania, and the Northern Territory. It was conducted with adult male offenders in 2001, adult female offenders in 2003, and with juvenile offenders in 2005.

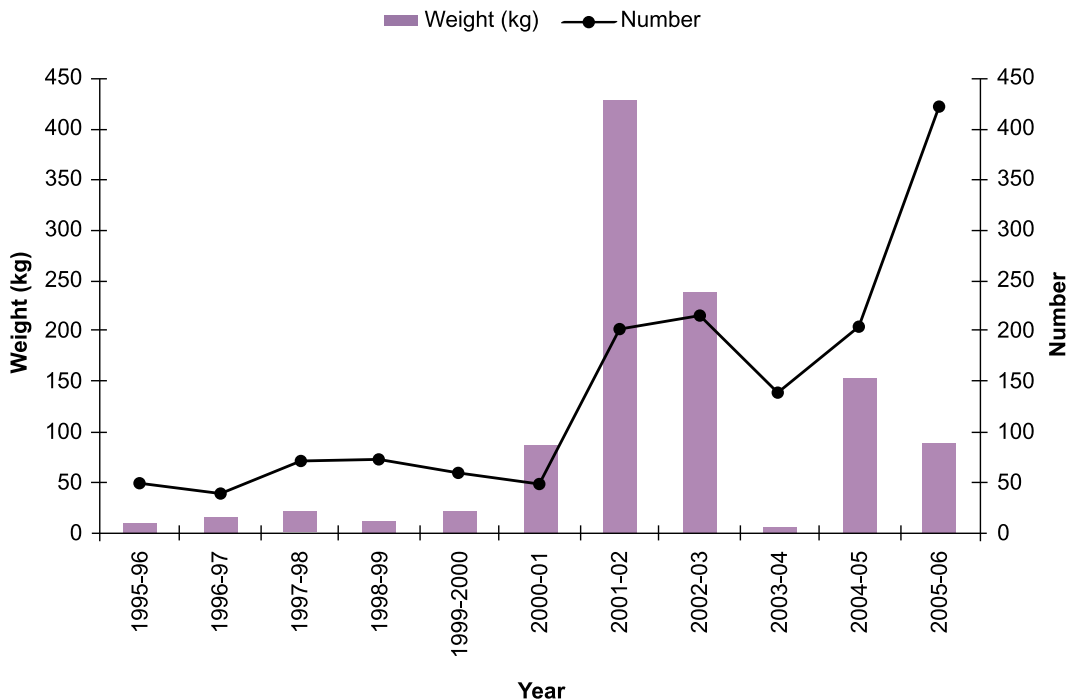
## 1.6 Availability

Methamphetamine is readily available on the drug market in most areas of Australia. The 2005-06 IDDR found that the total weight of ATS seizures increased nationally from a few hundred kilos each year during the late 1990s to an average of around 1700 kilograms per annum over the past five years (Australian Crime Commission, 2007). The significance of the weight data is difficult to judge as several large MDMA seizures at the border in 2001-02, 2002-03 and 2004-05 distort the totals. Nonetheless, there has been a significant increase in the amount of ATS/MDMA seized over the past five years when compared to the previous five year period. Figures 1.2 and 1.3 show this relationship between number and weight of seizures for amphetamine and phenethylamine at the Australian border over

a 10-year period. While some of the increase can be attributed to more effective detection techniques, it may also indicate a marked increase in the availability of these drugs in Australia over the past decade.

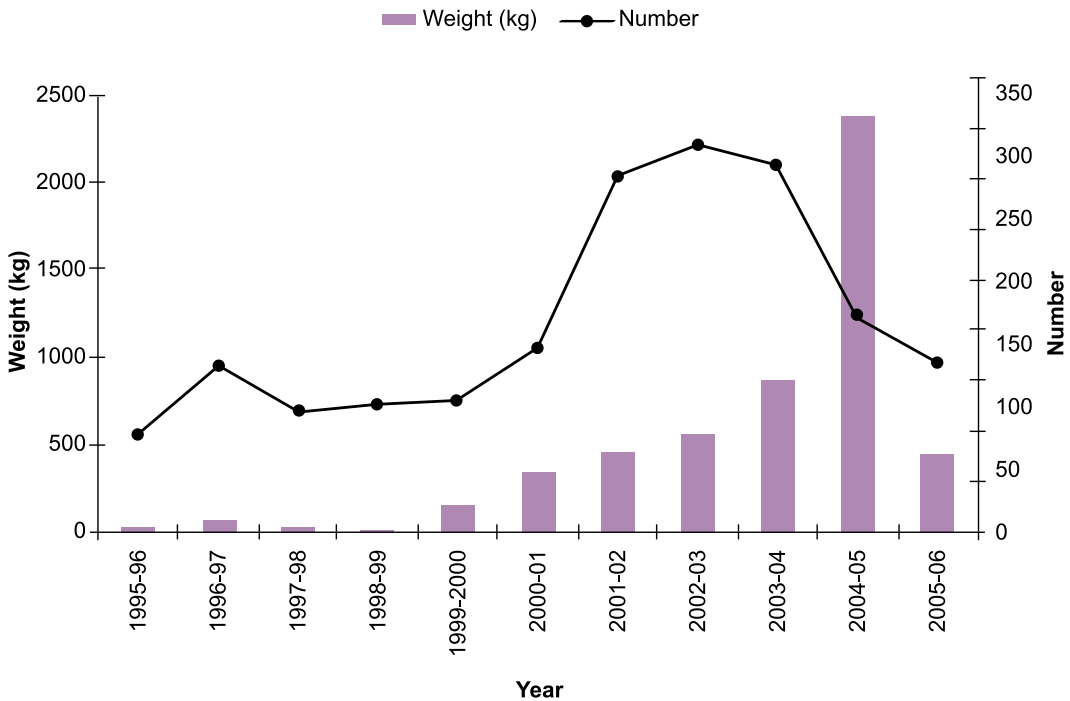
Indications of availability from official records, such as seizure data, can be complemented by surveys with the general population and with specific groups of drug users. Both IDRS and EDRS enquire about market aspects of illicit drugs in the interviews conducted with regular users. The greatest proportion of the 2006 IDRS sample rated all forms of methamphetamine as 'easy' or 'very easy' to obtain, and availability over the previous six months as 'stable' (O'Brien et al., 2007). Jurisdictional differences were observed, most notably in the Northern Territory where participants in Darwin rated all forms of methamphetamine as 'difficult' to obtain. The findings of the 2006 IDRS regarding availability of methamphetamine were supported by those of the 2006 EDRS. The greatest proportion of the national sample of REU rated availability of all forms of methamphetamine as 'easy' or 'very easy', and availability over the previous six months as 'stable' (Dunn et al., 2007). These were also the most common responses found for availability of ecstasy.

Figure 1.2: Number and weight of detections of amphetamine (excluding phenethylamine) at the Australian border, 1995–96 to 2005–06



Source: Australian Customs Service

Figure 1.3: Number and weight of detections of phenethylamine (MDMA/ecstasy) at the Australian border, 1995–96 to 2005–06

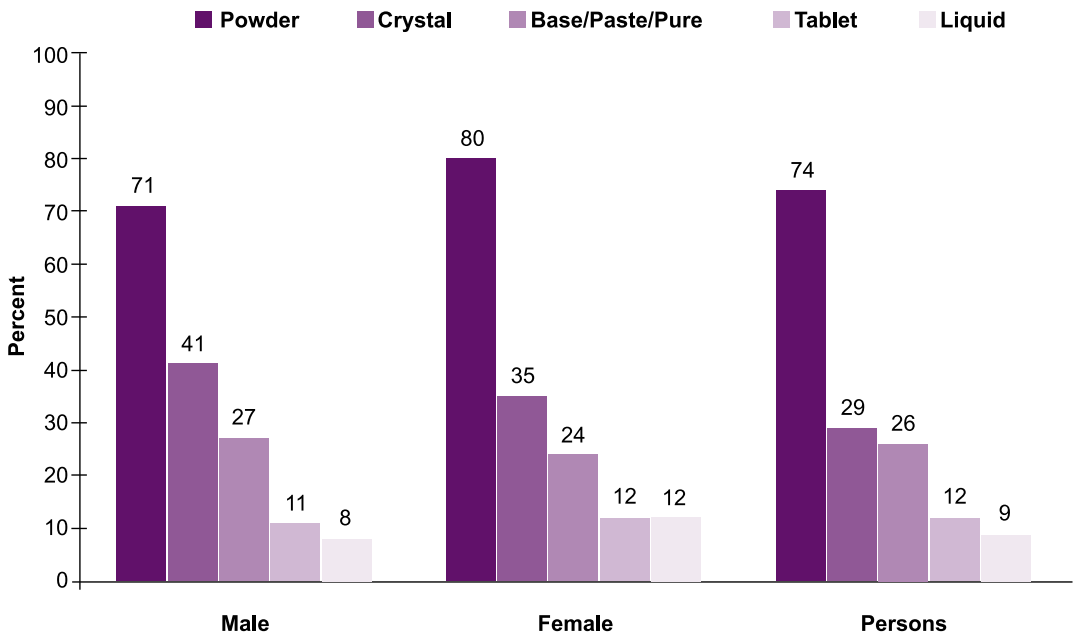


Source: Australian Customs Service

Responses from the 2006 sample of police detainees for DUMA suggest there have been some changes to the methamphetamine markets. Just under a third (30%) indicated it was harder to obtain their preferred form of amphetamine in the past 12 months and 26% indicated there had been an increase in price in the past 12 months (Mouzos et al., 2007). Difficulty with supply may account for the decrease in 2006 in the percent of detainees indicating crystal methamphetamine as their preferred form of amphetamine.

According to the 2004 NDSHS, the most common form of methamphetamine used by the Australian general population in the last 12 months was powder (74%) followed by crystal (29%), base (26%), tablets (12%) and liquid (9%) (Australian Institute of Health and Welfare, 2005a). Figure 1.4 shows little variation between males and females, although females are slightly more likely to report using powder.

Figure 1.4: Forms of methamphetamine\* used by recent users\*\*, 2004



\*Respondents could select more than one type

\*\* Self reported use in past 12 months

Source: 2004 National Drug Strategy Household Survey – detailed findings, N=29,445 respondents

The national consultations reported variations in availability of methamphetamine across the country and geographic variations in terms of demand and supply. There was general concern however, that ATS were becoming more widely available in rural and remote Australia. This is supported by research in rural and remote Australia that reported a perception that methamphetamine use was increasing in these areas (Delahunty & Putt, 2006).

## 1.7 Price

Among IDU in the 2006 IDRS, the price across forms of methamphetamine remained fairly stable, with some variation between capital cities (O'Brien et al 2007; see Table 1.3). In particular, IDU from Sydney reported much lower prices for powder while IDU from Darwin reported much higher prices for crystal. While there were jurisdictional variations between prices reported for forms of methamphetamine by REU in the 2006 EDRS, the greatest proportion reported the price for all forms as 'stable' over the previous six months (Dunn et al., 2007). The median price per ecstasy tablet ranged from \$30 in Sydney, Melbourne, Adelaide and Brisbane to \$50 in Darwin and, with the exception of Darwin, the price of ecstasy had declined over the period 2003-2006 (Dunn et al., 2007). Police detainees were also more likely to report that price had not increased in the past 12 months (74%) (Mouzos et al., 2007).

Table 1.3: Estimated availability and median price of methamphetamine by jurisdiction, 2000-2006

	Availability# 2006	Price (\$) per gram of powder							Price (\$) per point of base and ice*												
		2000	2001	2002	2003 (point)	2004 (point)	2005 (point)	2006 (point)	2000	2001	2002		2003		2004		2005		2006		
											Base	Ice	Base	Ice	Base	Ice	Base	Ice	Base	Ice	
NSW	Powder & Base: Easy to very easy, Stable Ice/crystal: Very easy; Stable	90	100	100	50 <sup>^</sup> (50)	100 (50)	90 (50)	100 (50)	50	50	50	50	50	50	50	50	50	50	50	50	50
ACT	Powder: Easy, Stable Base: Easy to very easy, Stable Ice/crystal: Easy to very easy; Stable to easier	180	250	300	175 <sup>^</sup> (50)	200 (50)	125 (50)	175 <sup>^</sup> (50)	-	50	50	50	50 <sup>^</sup>	50	50	50	50	50	50	50	50
VIC	Powder: Very easy, Stable Base <sup>^</sup> : Mixed reports (easy/difficult); Stable to more difficult Ice/crystal: Easy to very easy; Stable	50	200	200	200 (40)	180 (40)	200 (40)	200 (35)	50	50	35 <sup>^</sup>	50	40 <sup>^</sup>	50	35 <sup>^</sup>	50	45 <sup>^</sup>	50 <sup>^</sup>	50 <sup>^</sup>	50 <sup>^</sup>	50
TAS	Powder & Base: Easy to very easy, Stable Ice/crystal: Very easy; Stable	80	70	80	215 <sup>^</sup> (50)	290 (50)	300 (50)	300 <sup>^</sup> (50)	50	50	50	50 <sup>^</sup>	50	50	50	50	50	50	50	50	50
SA	Powder & Base: Very easy, Stable Ice/crystal: Easy to very easy; Stable	50	50	50	100 (25)	50 (27.50)	200 (41.50)	150 <sup>^</sup> (50)	30	30	25	25	30	50	25	30	50	50	50	50	50
WA	Powder & Ice/crystal: Easy to very easy, Stable Base: Mixed reports (difficult to very easy); Stable	200	250	250	260 (50)	260 (50)	300 (50)	300 (50)	50	50	50	50	50	50	50	50	50	50	50	50	50

Source: IDRS IDU interviews

# Participants were asked 'How easy is it to get at the moment?' and 'Has this changed in the last six months?'

<sup>^</sup> Reports based on small numbers (n<sub>≤</sub>10), interpret with caution

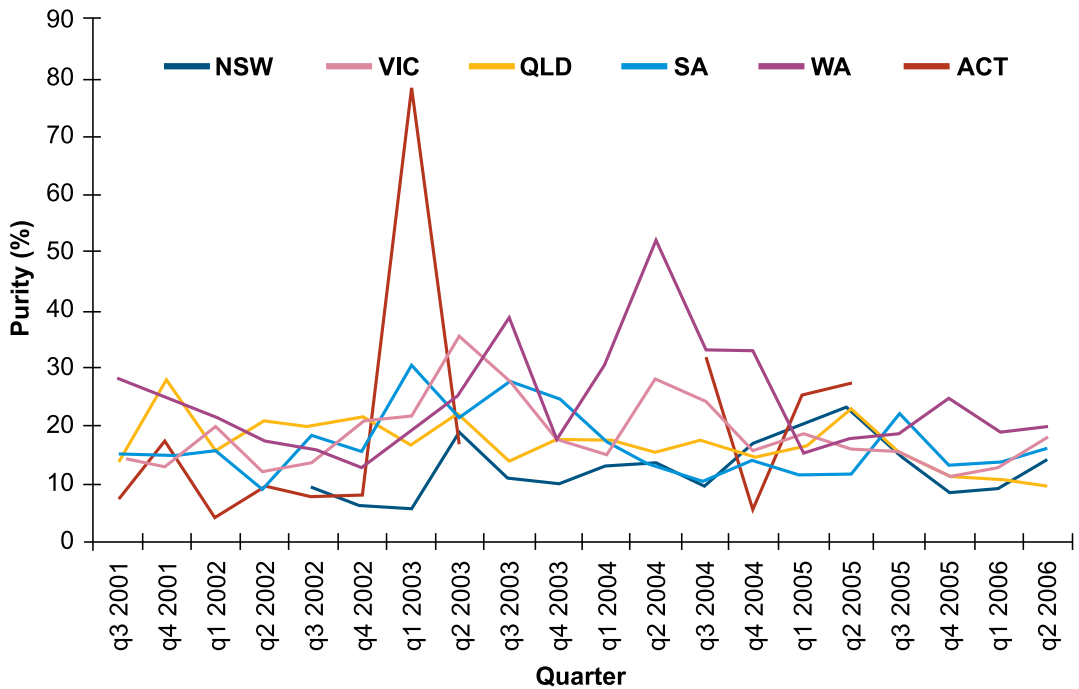
\* In 2000 and 2001 base and ice/crystal were combined under 'potent forms' of methamphetamine, and therefore the price reflects both forms. From 2002 to 2006 base and ice/crystal were separated to provide more detailed information on the price and availability of the different forms of methamphetamine

Note: Dashes represent no purchases

## 1.8 Purity

According to the IDDR (Australian Crime Commission, 2007), purity levels vary markedly from 1% to 99% pure for both amphetamine and methamphetamine samples. Not all seizures by Australian law enforcement agencies are subjected to forensic analysis. In 2005/06, 193 amphetamine seizures were tested and 4878 methamphetamine seizures were tested. Their median purity varied from 7% to 79%. The largest number of seizures tested were in Queensland (n=1649) and South Australia (n=1319), while no seizures in the ACT or the NT were tested.

Figure 1.5: Median purity of methamphetamine samples, 2001/02–2005/06



Note: Breaks in the lines in this chart indicate that no seizures were analysed in that quarter.

Source: ACC Illicit drug report 2005-06:16.

Given that all the forms of methamphetamine are classified together by forensic laboratories for testing, it is difficult to determine the purity of the different forms. Estimates ranged from 10% purity for powder forms, 21% for base methamphetamine, and 19% to 80% for crystalline methamphetamine (National Leadership Forum on Ice, 2006). The majority of IDU in the 2006 IDRS reported the current purity of powder as 'low', base as 'medium', and the purity of crystal methamphetamine as 'high' (O'Brien et al., 2007). The greatest proportion of IDU rated the purity of all forms of methamphetamine as 'stable' over the previous six months (O'Brien et al., 2007). Differences emerged in perceptions across capital cities of drug purity by IDU. Ratings of 'high' purity for both speed and base were greatest in Melbourne (25% and 50% respectively) and Adelaide (24% and 49% respectively), and for crystal in Brisbane (68%), Perth (59%) and Hobart (51%) (O'Brien et al., 2007).

In the 2006 EDRS, the greatest proportion of REU reported the purity of all forms of methamphetamine as 'high' or 'medium' (Dunn et al., 2007). It is noted that these ratings are subjective in nature and although some users report the quality as high, the overall median purity generally remains low at less than 20% for those seizures tested by State and Territory police (Australian Crime Commission, 2007). However, AFP seizures have a much higher medium purity suggesting that methamphetamine, once it reaches users, has been significantly adulterated (Australian Crime Commission, 2007).

In the 2006 EDRS, the majority of REU in the national sample rated the current purity of ecstasy tablets as 'medium' (38%), followed by 'fluctuates' (31%) (Dunn et al., 2007). Accordingly, 32% of the national sample each rated purity of ecstasy over the previous six months as 'stable' and 'fluctuated' (Dunn et al., 2007). Ratings of current purity as 'high' were greatest among REU in Canberra (23%), Brisbane (22%) and Sydney (20%), while ratings of current purity as 'low' was greatest in Perth (22%) (Dunn et al., 2007). As noted, the purity of ecstasy tablets varies considerably because of the mode of manufacture and levels of adulterants. The median purity of phenethylamines is estimated between 20% and 40% (Australian Crime Commission, 2007).

There was considerable comment across consultations and within the jurisdictions about the variable quality of ATS. It was suggested at one consultation that domestically manufactured ATS are becoming purer in content, although are still not to the standard of those imported from SE Asia. Many at the consultations and key stakeholders considered street amphetamine to be heavily adulterated with other substances including sugar, ephedrine, glucose, talcum powder and quinine. One adulterant used in the production of methamphetamine is dimethylsulphone (also known as MSM), a dietary supplement for arthritis sufferers. MSM can be added to methamphetamine during the final stages of the production process to give a similar appearance to crystal methamphetamine (Fetherston & Lenton, 2007). This may in turn lead some users to believe that they are consuming the higher potency crystalline form of methamphetamine when they are consuming lower purity forms of methamphetamine which have been given a crystal appearance.

The written submission from the National Drug and Alcohol Research Centre (NDARC) noted previous research suggesting that:

Several shifts in the drug market over the past decade have prompted concern. These include a shift from amphetamine to methamphetamine supply in the mid 1990s, an increase in the prevalence of use and related indicators in the late 1990s, and an increase in the purity of street level seizures of the drug from this time, with the emergence of imported high purity crystalline methamphetamine. Current community concern about methamphetamine reflects the culmination of these trends and a growing public awareness about this drug problem.

## 1.9 Routes of administration

Meth/amphetamine can be consumed by a variety of methods or routes of administration, including oral (swallowing), nasal (snorting), inhalation (smoking), vaginal/anal (shelving/shafting), and intravenous (injection). The method of administration depends both on the form of the drug and the norms of different groups of users (Mundy, 2001), and is a significant mediating factor on the effect of a drug. Various routes of administration are preferred because they can enhance or facilitate drug effects. A study of the Sydney methamphetamine market found that the majority of amphetamine users who had tried powder, base and crystal methamphetamine preferred the purer forms of the drug to achieve 'a more intense and longer lasting high' (McKetin, McLaren & Kelly, 2005). Intranasal or oral ingestion are common routes of administration by novice and recreational users, while injection is a common route of administration among heavier dependent users (Ross, 2007).

As noted, the route of administration also differs according to the form. Among the national sample for the 2006 EDRS, speed powder was most commonly 'snorted' (75%) or 'swallowed' (73%), base was most commonly 'swallowed' (84%), and crystal methamphetamine was most commonly 'smoked' (79%) in the previous six months (Dunn et al. 2007). Small proportions reported injecting in the last six months: 12% reported injecting speed, 18% reported injecting base, and 20% reported injecting crystal methamphetamine (Dunn et al., 2007). The main route of administration for ecstasy in the previous six months was 'swallowing', reported by 94% of the national sample (Dunn et al., 2007).

The route of administration also varies according to the user. In contrast to those who participate in the EDRS survey, regular amphetamine users in a study of methamphetamine use in Sydney were most likely to inject the three common forms of ATS – powder, base and crystal (McKetin, McLaren & Kelly, 2005). However, one-third reported that they usually snort powder and one quarter reported usually swallowing base. A quarter (25%) reported that their initial administration of the drug was through injecting and 63% had injected on the most recent use. Twenty-six percent reported that they injected daily and 38% reported injecting twice or more a week.

By definition (e.g., participants are recruited on the basis of regular injecting), the main route of administration for participants in the IDRS is injecting. Among police detainees, 70% reported that they had injected methamphetamine in the past 12 months and of those who had injected in the past 30 days, the average number of injections was 27 times during this period (Mouzos et al., 2007). Dependence on methamphetamine may partly be a function of route of administration. Among 310 regular methamphetamine users in Sydney, 67% of those who injected were dependent compared to 58% of those who smoked and 30% of those who snorted or swallowed the drug (McKetin, McLaren & Kelly, 2005). It was noted at one of the consultations that methamphetamine users themselves have distinct views about differences between injecting and non-injecting users, with a perception that injectors were 'more dependent' or 'more severe addicts' and more 'socially irresponsible' than non-injecting users.

Smoking methamphetamine has emerged as a trend in Australia following the increased availability of crystalline methamphetamine in 1999. Methamphetamine vaporises when heated and when inhaled, is rapidly absorbed into the pulmonary blood flow, giving an almost instant and intense drug effect (Australian National Council on Drugs, 2007). Crystal methamphetamine is typically smoked using a glass pipe, but it can be smoked using a 'bong' (water pipe used for smoking cannabis) or using a non-flammable surface (Australian National Council on Drugs, 2007). Methamphetamine is often smoked in social situations, where the methamphetamine pipe is passed among friends (Australian National Council on Drugs, 2007). The smoking of crystal amphetamine among young recreational drug users is a significant new trend because of the potential smoking has, given peer group influences, to introduce a younger, less experienced person to engage in a more risky pattern of drug use, and increase their risk of becoming dependent on methamphetamine (McKetin, McLaren & Kelly, 2005). One response in some jurisdictions has been to ban smoking equipment; however, there was concern at some consultations that such bans could influence smokers to move to injecting as a means of obtaining an instant drug effect.

## 1.10 Summary

The MCDS is represented by the Australian and State and Territory Ministers of Health and Law Enforcement and Education. The role of the Council is to determine national policies and programs intended to reduce drug related harm within the Australian community. Recently, the MCDS authorised development of a National ATS Strategy to complement existing strategies, such as the National Cannabis and Alcohol Strategies. These individual strategies are guided by the NDS, which adopts a harm minimisation approach to drug use and related harms in Australia by targeting reductions in supply, demand and harms.

ATS are all chemically related to the parent compound amphetamine and act as central nervous system stimulants. ATS include amphetamine and methamphetamine in forms of powder, base and crystal; MDMA (ecstasy) and related drugs such as MDA and MDEA; and pharmaceutical stimulants such as dextroamphetamine, methylphenidate and phentermine. ATS vary in form and purity, with crystal methamphetamine representing the most potent ATS. There is a relationship between both purity and method of administration with drug effects. There are various existing sources of data that can inform our understanding of patterns of ATS production, distribution, use and related problems. It will be important to ensure these data sources are coordinated to ensure current and accurate information are available to inform preventive and other responses to ATS use and related problems.

## Chapter 2: Setting the Context

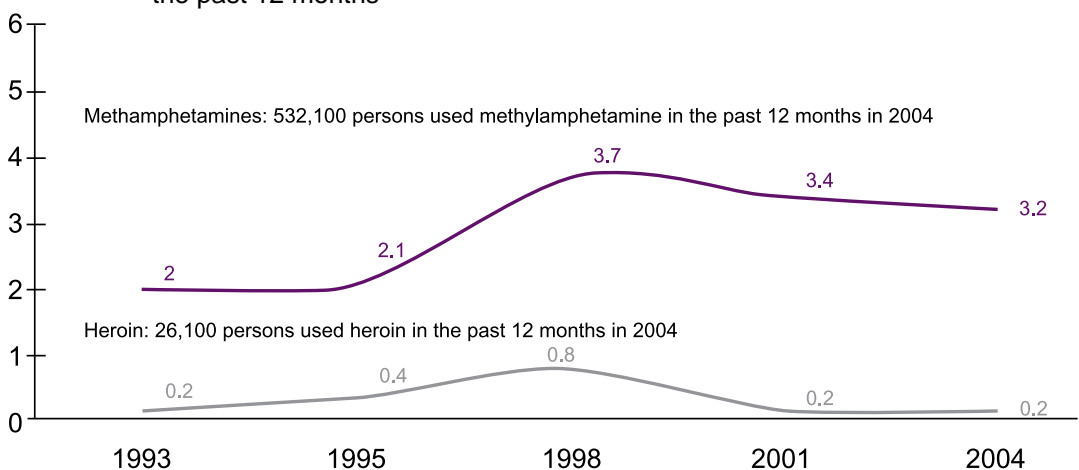
The United Nations Office on Drugs and Crime (UNODC) World Drug Report 2007 noted an overall stabilisation of the amphetamine-type stimulants (ATS) market worldwide. The increases found in production and demand throughout the 1990s appears to have leveled off, and this was attributed to improved efforts to monitor and control precursor chemicals. The Report stated that the largest production areas for methamphetamine remained in South East Asia and in North America, while both amphetamine and ecstasy production are primarily located in Europe. ATS continued to be the second most widely consumed drug group, after cannabis, with an estimated 25 million people worldwide using ATS (including ecstasy) in the previous 12 months over the 2005-06 period. Of these persons, an estimated 63% used methamphetamine, 16% used amphetamine, and 21% used other amphetamine and diverted licit amphetamine. In 2005, the highest prevalent rates for methamphetamine were in the Philippines, followed by Australia. Annual prevalence of amphetamine was highest in the Oceania region and Australia reported the highest rate within this region.

### 2.1 Prevalence of amphetamine-type stimulant use in the general population of Australia

#### Meth/amphetamine

According to the 2004 National Drug Strategy Household Survey (NDSHS), meth/amphetamine is the second most frequently used illicit drug in Australia after cannabis. Nine percent of Australians aged 14 years and older, about 1.5 million persons, have used meth/amphetamine for non-medical purposes at least once in their lifetime (Australian Institute of Health and Welfare, 2005a). The 2004 NDSHS estimated there were 532,100 persons (3.2%) who had used meth/amphetamine in the last 12 months and 97,000 persons (0.6%) had used the drug in the past week. The NDSHS consistently shows that self-reported rates of methamphetamine use in the past year are higher than rates of heroin use (see Figure 2.1).

Figure 2.1: Percent of general population who have used methamphetamine and heroin in the past 12 months



Of those who had used methamphetamine in the past 12 months, 11% used at least once a week (n=58,500), 45% monthly or every few months (n=239,400) and 43% used once or twice (n=228,800). Just over half reported using the drug in powder form (51%), while 23% reported using powder and crystal, 11% crystal only and 11% other forms. Adjusting for potential underreporting, the total number of users is estimated to be closer to 102,600 of whom around 72,700 are dependent users (McKetin et al., 2005).

The NDSHS show that patterns of use have generally increased since the early 1990s, with levels of recent use increasing by 60% over the 1993–2004 period (Australian Institute of Health and Welfare, 2005a). However, the two most recent surveys suggest rates are stabilising - 4.2% of males in 2001 compared to 4.0% in 2004 reported use of methamphetamine in the past 12 months and 2.7% of females in 2001 compared to 2.5% in 2004.

Significant differences exist between age cohorts, with the highest use of methamphetamine in the 20 to 29 year age cohort (Australian Institute of Health and Welfare, 2005a). About one in every five young adults in the 20 to 29 age cohort has tried this drug at least once and the average age of first use is 20.8 years. Many participants in the consultations noted the decreasing age of first time ATS use while some, like the consumer groups, also noted the increased use among older people particularly in the gay community.

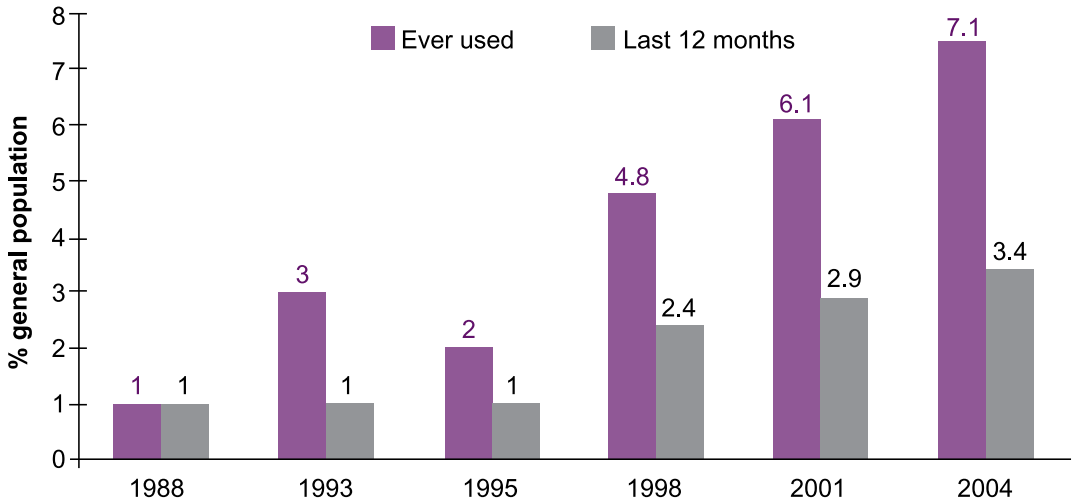
The consultations and submissions also acknowledged the increasing trends in amphetamine use up to 2004, but did not perceive a current 'epidemic' of methamphetamine use, as portrayed in the media. Demographic and geographic variations in the patterns of use across the country were noted and these may not be reflected in NDSHS statistics. For example, police in one regional area did not view ATS as a major issue suggesting it was used primarily by a relatively small group of 'thrill seekers' and alcohol was contributing to higher levels of problems in the community.

## MDMA (Ecstasy)

According to the 2004 NDSHS, there was no statistically significant increase in amphetamine use amongst the general population, while use of MDMA has steadily increased. Lifetime use increased from 1% in 1988 to 7.5% in 2004 and use in the past 12 months increased from 1% to 3.4% over the same time period (Australian Institute of Health and Welfare, 2005a). Smaller proportions had used ecstasy in the last month (1.3%) and in the last week (0.5%). As with methamphetamine, the 20–29 year age group had the highest proportion of persons ever using MDMA (22%). Males were more likely to use ecstasy than females, both in their lifetime (9.1% versus 6.05) and in the last 12 months (4.4% versus 2.4%).

Increased prevalence of ecstasy use was noted at consultations and there was general concern that its use had become perceived as a 'harmless recreational/party drug' to be taken occasionally. Participants commented that its effects are seen as less acute than those of other ATS and indeed, there is a lack of awareness that it is related to other ATS. One participant stated that it was a preferred drug due to its image as 'softer' and 'less potent'. At some consultations it was suggested that ecstasy use is more prevalent than crystal methamphetamine in affluent sectors and among university students, partly due to a perception of acceptability of use, 'elitism', its image as a social drug, and a lack of awareness of adverse consequences.

Figure 2.2: Prevalence of ecstasy use in Australia, 1988-2004



Source: National Drug Strategy Household Survey 1988-2004

## 2.2 Australian surveys with key consumer groups

Use of ATS is more prevalent among certain population groups than in the general population, as evidenced by surveys with key consumer groups. Three such groups are injecting drug users, regular users of ecstasy and related drugs, and incarcerated persons. Amongst all three groups, use of methamphetamine is considerably higher than the general population. Use of methamphetamine around the time of the interview is highest for police detainees. However over a longer time frame, a greater percent of injecting drug users (IDU) report use of methamphetamine followed by regular 'ecstasy users' (REU) (see Table 2.1).

### Injecting drug users

According to the 2004 NDSHS, 1.9% (n=313,500) of those aged 14 years and older were estimated to have ever injected illicit drugs and 0.4% (n=73,800) were estimated to have injected in the past 12 months (Australian Institute of Health and Welfare, 2005a). Of those who had reported using meth/amphetamine in the past 12 months 82% had never injected, 14% had injected powder and 12% had injected crystal. In comparison, 87% of recent heroin users injected the drug. However, just over half of users reported they were more likely to initiate their first use of meth/amphetamine via injection (59%) compared to a quarter of heroin users (25%).

Table 2.1: Use of ATS among key sentinel groups in 2006 (%)

	IDUs (IDRS)	Police detainees (DUMA)	REU (EDRS) (a)
<b>Methamphetamine</b>			
Tested positive/used day before interview	18	25	n/a
Used in the past 30 days	n/a	31	n/a
Used in the past 6 months	79	n/a	64
Used in the past 12 months	n/a	43	n/a
Ever used	96	64	84
<b>MDMA</b>			
Tested positive	n/a	2.5	n/a
Used in the past 30 days	n/a	9	100
Used in the past 6 months	26	n/a	100
Used in the past 12 months	n/a	20	100
Ever used	68	46	100
(n)	(914)	(4,457)	(752)

(a) Data are for meth power (speed) only

The 2006 Illicit Drug Reporting System (IDRS) reported on a sample of 914 IDU from every jurisdiction of Australia. Of the total sample, 96% reported lifetime use of a form of methamphetamine and 94% reported injecting a form of methamphetamine in their lifetime (O'Brien et al., 2007). Lifetime use of speed was reported by 90% (86% reported lifetime injection), lifetime use of crystal methamphetamine was reported by 78% (75% reported lifetime injection), and lifetime use of base was reported 62% (60% reported lifetime injection). In the last six months, 79% of the total sample reported use of any form of methamphetamine and 78% reported injecting a form of methamphetamine in the last six months. In the last six months, 57% used (55% injected) crystal methamphetamine, 56% used (55% injected) speed powder, and 38% used (37% injected) base. While prevalence of speed and base were comparable to the previous year, recent use of crystal methamphetamine had increased from 43% in 2005 to 57% in 2006.

Amongst the total national sample, 49% reported that meth/amphetamine were the first drug they had injected (compared to 41% for heroin) and 30% that methamphetamine was the last drug injected (compared to 26% for heroin) (O'Brien et al., 2007). Furthermore, methamphetamine was the drug nominated by the greatest proportion of IDU (33%) as the drug most often injected in the last month (compared to 27% for heroin). However, heroin remained the drug of choice for the largest proportion of the sample (48%), with 23% nominating methamphetamine as their drug of choice.

### Regular ecstasy users

The 2006 Ecstasy and Related Drugs Reporting System (EDRS) reported on a sample of 752 REU from every jurisdiction in Australia. Participants were recruited on the basis of using ecstasy at least monthly during the previous six months. The median age of first use of ecstasy was 18 years, and the median age at which regular use commenced was

19 years (Dunn et al., 2007). The median duration of ecstasy use was three years. Approximately half (48%) of the total sample reported using ecstasy fortnightly to monthly and 23% reported using ecstasy more than once a week. A median of 2 tablets was used in a typical session. Participants were asked about 'binge' use, defined as use of a drug continuously for more than 48 hours without sleep. Of the total sample, 49% had binged in the last six months and of these, 90% had binged on ecstasy, 54% on speed and 49% on crystal methamphetamine.

With regards to use of methamphetamine, of the total REU sample, 84% reported lifetime use of speed, 65% crystal methamphetamine, and 52% base (Dunn et al., 2007). In the last six months (recent use), 64% had used speed, 49% crystal methamphetamine, and 34% base. While rates of base use were comparable to 2005, recent use of speed decreased from 74% in 2005 to 64% in 2006, and recent use of crystal methamphetamine increased from 38% in 2005 to 49% in 2006.

## Prisoners

The overall imprisonment rate at 30 June 2006 was 163 prisoners per 100,000 adult population (n=25,353) (Australian Institute of Criminology, 2007a). This represents an increase of more than 20 percent since 1996, although the rate of imprisonment appears to be slowing with only a 1% increase since 30 June 2005 (Mouzos et al., 2007). This increase is comprised of a 6% increase in remand prisoners and a 2% decline in sentenced prisoners (Mouzos et al., 2007). The average length of sentence for offenders in custody is less than 12 months in every jurisdiction and this brief period inhibits the capacity of the prison service to effect behaviour change, rehabilitate or re-educate drug offenders and highlights the need for throughcare models to address the needs of prisoners (Borzycki, 2005).

A majority of the prison population and those in community corrections are male. Between 1984 and 2005, the overall imprisonment rate for males increased from 170 to 309 per 100,000 adult male population, while the female rate of imprisonment across the same period increased from 7 per 100,000 to 22 per 100,000 (Australian Institute of Criminology, 2007a). Indigenous people are over represented in the prison population and in community corrections. In 2004-05, the national community corrections rate was 337.9 per 100 000 adults compared to the national rate for Indigenous offenders of 2946.3 per 100 000 (Steering Committee for the Review of Government Service Provision, 2006). The majority of all those receiving a sentence is most likely to be for a violent offence followed by a property offence (Australian Institute of Health and Welfare, 2007).

According to the Drug Use Careers of Offenders (DUCO) male prisoner survey, the majority of offenders reported having used illegal drugs and commonly engaged in polydrug use. In the survey, 58% of male offenders reported lifetime use of amphetamine, 42% reported use in the six months prior to arrest, and 31% reported being a regular user (see Table 2.2) (Makkai & Payne, 2003). The conversion rate from having ever used to regular use was 53%. Amongst those who were current users, 44% reporting using several times a day; 13% once a day, 24% one or several times a week and 19% reporting using one to several times a month or less. The prevalence of methamphetamine use varied across different offender types, with regular violent offenders, homicide offenders and non-regular offenders less likely to have been regular methamphetamine users prior to incarceration (see Table 2.2).

Following the DUCO male offender survey, a subsequent survey was conducted with a sample of 470 females incarcerated in six jurisdictions in Australia. This study found that 61% had tried amphetamine, 42% had used in the six months prior to their imprisonment and 37% had been regular users (Johnson, 2004). Thirty-nine percent reporting using several times a day and 17% reported using on a daily basis. Thirty-nine percent of the sample reported being regular users of more than one type of illegal drug in the six months prior to arrest. Of those who were amphetamine users, 63% also used cannabis, 40% used heroin, and 30% used benzodiazepines, with only 19% reporting use of amphetamine only.

An interesting trend noted in the 2002 Drug Use in Australia (DUMA) report was that, among those who provided a urine sample across all sites of the study, female detainees were more likely than male detainees to test positive for amphetamine (39% compared to 28%) (Makkai & McGregor, 2003). Differences between males and females fluctuate each year in the DUMA survey and this may be due to the smaller sample size for female respondents. However, these percentages are considerably higher than those reported by women in the general population.

**Table 2.2: Prevalence of methamphetamine use among incarcerated male offenders**

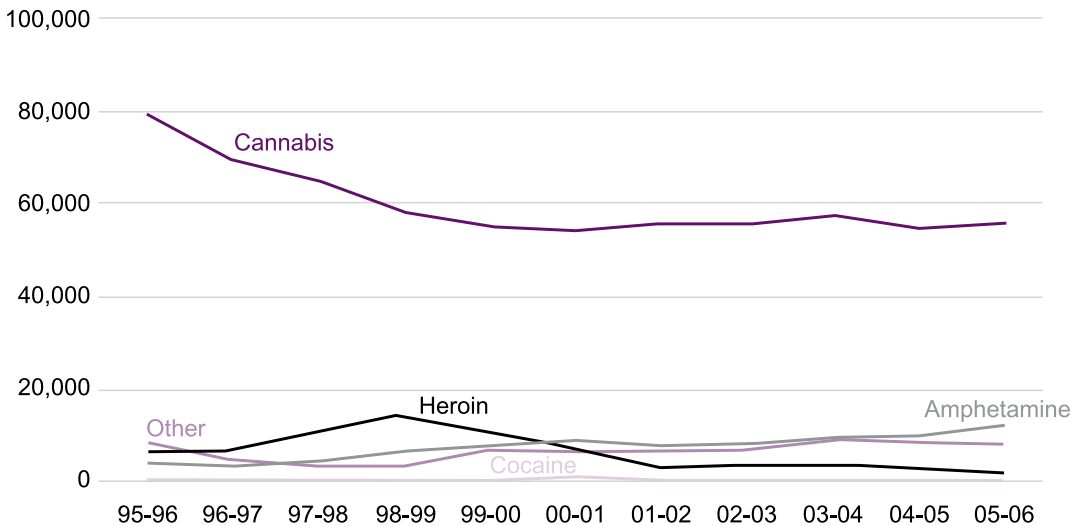
	Regular property offenders	Regular violent offenders	Regular multiple offenders	Fraud offenders	Regular drug sellers	Regular drug buyers	Homicide offenders	Non regular offenders	All prisoners
Sample size (n)	566	167	311	180	148	144	113	506	2135
Prevalence (%)									
Ever used	77	40	80	82	82	74	35	14	58
Used in the six months prior to arrest	59	26	60	62	54	53	17	7	42
Current regular user	46	16	49	49	41	35	6	3	31
Escalation - from ever to current regular (%)	60	40	61	60	50	47	17	21	53
Frequency of use for current regular users (%)									
Less than monthly	11	4	8						9
one to several times a month	11	4	10						10
one to several times a week	22	30	24						24
Once a day	15	19	13						13
Several times a day	42	44	45						44
(Total)	100	100	100						100

Source: Australian Institute of Criminology, DUCO Male Survey, 2001

The use of MDMA among police detainees is uncommon. Urinalysis testing of police detainees found that the proportion testing positive to MDMA increased from 0.5% in 2000 to 2.5% in 2006 (Mouzos et al., 2007). Caution must be exercised with self-reported use of MDMA as the drug is often sold under this label, but may not always contain MDMA when chemically tested (Dunn et al., 2007). This is confirmed by comparing police detainees' self-reported use of MDMA with their urinalysis results. A substantial proportion of those who report use in the past 48 hours do not test positive to MDMA (Mouzos et al., 2006).

The high domestic demand for ATS is reflected in arrest figures for ATS offences Australia-wide, which are greater than any other drug category except cannabis (AIC, 2007). Arrests for ATS offences (including MDMA) have risen from around 4% of all drug arrests in 1995-96 to around 14% in 2005-06 —around 75% of all drug arrests relate to cannabis (see Figure 2.3).

Figure 2.3: Arrests for drug-related offences



Source: Australian Institute of Criminology, 2007

By comparison with the general population of drug users, police detainees report much higher rates of injecting. Injecting drug use was more common among heroin and methamphetamine adult users, with 88% of heroin users and 70% of methamphetamine users reporting they had injected that drug in the past 12 months (Mouzos et al., 2007). Of those who had injected in the past 30 days, detainees reported injecting an average of 27 times and this was consistent with findings from the previous year in 2005 (Mouzos et al., 2007).

## 2.3 Jurisdictional variations

### Methamphetamine

In the 2006 IDRS, while there was a general pattern of increased crystal methamphetamine compared to 2005, variations were observed in use of forms of methamphetamine between jurisdictions. Crystal methamphetamine was the form most used in the last six months

(recent use) in Canberra, Perth and Sydney (O'Brien et al., 2007). Recent use of crystal methamphetamine in Canberra increased from 62% in 2005 to 88% in 2006, in Perth from 68% in 2005 to 76% in 2006, and in Sydney from 35% in 2005 to 50% in 2006. Speed powder was the most common form recently used in Melbourne, Darwin and Brisbane, with the highest proportion of IDU reporting use of speed powder in Melbourne at 71%. Base was the form most used in Hobart and Adelaide.

As with the IDRS, there were jurisdictional variations in the REU samples of the 2006 EDRS. Crystal methamphetamine was the form most used in Perth, both lifetime use (89%) and recent use (77%) (Dunn et al., 2007). Lifetime use of crystal methamphetamine was also common in Melbourne (73%), Adelaide (73%) and Sydney (68%). Recent use of crystal methamphetamine was common in Adelaide (61%), Sydney (56%) and Brisbane (50%). Speed was the form most used in Melbourne, both lifetime use (100%) and recent use (91%). Lifetime use of speed was above 75% in all jurisdictions and over half the samples from all jurisdictions had recently used speed. Base was the most common form used in Adelaide, both lifetime use (72%) and recent use (63%). Lifetime use of base was reported by just over half or less of all other jurisdictions, while recent use was reported by less than half of the samples in all other jurisdictions.

As with these samples, there are variations across sites among police detainees. The highest use is found in East Perth followed by the two sites in Adelaide, then Brisbane and Southport (Mouzos et al., 2007). Darwin has the lowest percent testing positive to methamphetamine or reporting use in the past 30 days.

**Table 2.3: Patterns of methamphetamine use by police detainees across jurisdictions**

	Tested positive (%)	Used in the past 30 days (%)
East Perth	33	43
Adelaide	30	39
Elizabeth	30	36
Brisbane	26	35
Southport	23	33
Parramatta	22	26
Sunshine/Footscray	25	25
Bankstown	16	15
Darwin	5	8

Source: DUMA collection 2006 (AIC)

## 2.4 At-risk populations

### Young people

The 2004 NDSHS reported on the use of illicit drugs by the population aged 12 years and older. Use of meth/amphetamine was reported by 0.7% aged 12-15, 3% aged 16-17, and 8.8% aged 18-19 (Australian Institute of Health and Welfare, 2005a). Rates for ecstasy used were similar, reported by 0.6% aged 12-15, 2.8% aged 16-17 and 8.8% aged 18 to 19. While

this survey is conducted with the general population, the Australian Secondary Students' Alcohol and Drug (ASSAD) Survey reports the use of over-the-counter and illicit drugs among students aged 12 to 17 years attending grades 7 to 12 across Australia. The 2005 ASSAD found that the vast majority (95%) of secondary school students had never used amphetamine (White & Hayman, 2006). By the age of 17, 7% of students reported some experience with amphetamine and approximately 3% of students 14 years and over reported using amphetamine in the month before the survey. Of the 4% of students who used amphetamine in the year before the survey, 39% of males and 48% of females indicated that they had used them once or twice. While there was no change in the proportion of 12 to 15 year-olds or 16 to 17 year-olds using amphetamine in their lifetime between 2002 and 2005, there was a significant decrease between 1999 and 2005 for both age groups. However, there was no change in the proportion of students in both age groups using amphetamine in the month prior to the survey between 1996 and 2005. Only 4% of students had ever used ecstasy and recent use was not common among any age group. 2% of students aged 16 to 17 had used ecstasy in the month prior to the survey.

Results from the 2005 ASSAD Survey also indicate that poly-drug use is frequent among secondary students aged 12 to 17 years. Students who had used cannabis, amphetamine, hallucinogens or ecstasy reported on other drugs used concurrently. Between 53% and 68% used alcohol concurrently with these four drugs and between 41% and 48% used tobacco. Over one-third of students using amphetamine, hallucinogens or ecstasy also used cannabis concurrently. One-quarter of students using hallucinogens, one-fifth of students using cannabis, 18% of students using amphetamine and 17% using ecstasy did not use any other substance.

In their submission, the Youth Substance Abuse Service (YSAS) in Victoria reported on an analysis of the primary drug of choice being used by young people presenting over the past five years. Results demonstrate that presentations for heroin use dropped markedly, while there were corresponding increases in cannabis, alcohol, and ATS use during this period. This submission reported that presentations for heroin treatment decreased from 48% in 2001-02 to 19% in 2005-06, while presentations for ATS increased from 7% in 2001-02 to 8.5% in 2005-06. These findings are contrary to those reported by the Ted Noffs Foundation (TNF) (see [www.noffs.org.au/programs/palm.shtml](http://www.noffs.org.au/programs/palm.shtml)). TNF provides youth-specific programs including Adolescent Drug Withdrawal Unit (ADWU), which is a 2-week residential program for withdrawal and longer residential treatment in the rehabilitation program called Program for Adolescent Life Management (PALM). PALM is designed for 14 to 18 year olds with serious alcohol, or other drug-related difficulties. Research found that 21.8% of admissions in 2001 nominated ATS as their primary drug of concern, compared with 41.7% in 2004. This was higher than for heroin, and second only to cannabis. Further, it also found that, between 2001 and 2006, a sample of 566 clients with ATS as the primary or secondary drug of concern were more likely to be female, have injected any drug, had suicidal thoughts in the last 3 months, had made a suicide attempt, reported self harm and scored higher on depression, anxiety, hostility, paranoia and psychoticism on the Brief Symptom Inventory (BSI). These users were also more likely to have lived in more places in the six months prior to treatment entry, were more likely to have been sexually and physically assaulted by a stranger or by a known person, been violent and aggressive as a consequence of their drug use, and been involved in a greater variety of crime.

It is recognised that some young people who engage in drug use are at risk of developing chronic patterns of use, including frequent, harmful binge use (Mattick & Darke, 1995). For some vulnerable young people, drug use may contribute to social exclusion and difficulties related to school, poverty, and involvement in criminal activities (NSW Health, 2005).

For those young people who do seek help for illicit drug problems, research cited above suggests that ATS are increasingly becoming the major drug of concern. Within this drug class, different types of ATS may present distinct challenges for interventions. For example, a recent study conducted in the United States with a sample of 23,645 young people aged 18 to 25 years investigated risk and protective factors for both methamphetamine use and nonmedical use of prescription stimulants. This study reported differences in associations among these various drugs. Methamphetamine use was more common among females, individuals not enrolled in college, and those who had been arrested, whereas nonmedical prescription stimulant use was associated with psychological distress, sensation seeking, binge drinking and college enrolment (Herman-Stahl et al., 2007). Such findings highlight the importance of tailoring intervention strategies to particular groups of young people and particular drug types/problems.

Recent research in Australia investigated the predictors and effects of early-onset amphetamine use in a representative cohort of young people followed up over an 11-year period in Victoria (Degenhardt et al., 2007a&b). A sample of 1943 adolescents was recruited at age 14 to 15 years and interviewed on eight occasions, with 78% follow-up at final interview. Use of amphetamine in young adulthood was strongly predicted by adolescent drug use and associated with current other drug use, while psychological distress was not found to be an independent predictor (Degenhardt et al., 2007a). Adolescent amphetamine use by young adulthood increased the likelihood of meeting criteria for dependence on a range of drugs, poorer mental health and limitations in educational attainment (Degenhardt et al., 2007b). However, these associations were not sustained after adjustment for early-onset cannabis use, leading the authors to conclude that the problems associated with adolescent amphetamine use were largely accounted for by their even earlier onset of cannabis use (Degenhardt et al., 2007b). Such findings highlight the need for studies to take into consideration the use of other drugs in ATS-related research.

The submissions and consultations noted that changes in patterns of drug use by young people highlight the importance of remaining abreast of drug use changes and reconfiguring services to meet new demands, for example, behavioural impacts resulting from specific drug types. In particular, there was some concern that ATS use among young people presented some particular challenges. For example, the submission from YSAS noted that:

Our research and practice experience suggests the key issues for YSAS in managing and treating heroin and cannabis use are very different to the treatment needs of those using ATS.

Almost all consultants pointed to a lack of knowledge by young people (including consumers) about meth/amphetamine, blood borne viruses, the law and health risks. The role of peer pressure was identified as a significant influence in first time use. However, peer groups were also identified as potentially important in strategies to assist current users. For example, some participants insisted that young people preferred to receive drug education from people who they considered have drug use experience, suggesting that peer education

models might be useful. On the other hand, others have argued that such personal experience could interfere with the capacity to deliver objective and effective interventions (see Chapter 4).

Concern was also expressed about the use of MDMA by young people. The submission from Headscape noted that:

ecstasy doesn't generate the same emotional response...thought of as a 'party drug' – not presenting with problems, don't impact on services, not in contact with criminal system...use is normalised, swallowing seen as attractive and easy method of administration. Concerns are what's in the pills and this makes use unsafe, e.g., PMA – issue of pill testing. .... Ecstasy not viewed as having any related harms or problems, but more as a social drug with use becoming more normalised. Also of concern is lack of research about long-term effects of ecstasy.

During the consultations, the role of the media and the marketing of products to appeal to young people were emphasised during the consultations. One participant pointed to 'misleading and mischievous' advertising for some soft drinks and chewing gum, which had drug-related sub-texts.

The submission from Headscape noted that:

Young people, aged 12- 25 year (sic), should be identified as a priority target group in the ATS strategy. It is clear from available research that this is the time when recreational drug use is initiated. Early and appropriate intervention into drug misuse and abuse impacts on young people's choices around ongoing or prolonged use of drugs and therefore the longer term impact on the health system.

### Aboriginal and Torres Strait Islander community

There is relatively little prevalence data on ATS use by Aboriginal and Torres Strait Islander people. One source of such data is the Statistics on Drug Use in Australia 2002, which found that 13% of Indigenous Australians reported using an illicit drug other than cannabis in the last 12 months compared to 8% of other Australians (Australian Institute of Health and Welfare, 2003). Evidence suggests that methamphetamine use is increasing in Aboriginal communities and a preference among Indigenous injecting drug users for methamphetamine over heroin (Nicholas & Shoobridge, 2005).

There is variation in substance use across geographical locations, and ATS are more commonly used among Aboriginals living in urban areas (Australian Institute of Health and Welfare, 2006b). When police were asked about the prevalence of amphetamine in Indigenous communities, 57% reported that it was commonly used in urban areas and 25% reported it was commonly used in non-urban areas (Putt, Payne & Milner, 2005). The 2004-05 National Aboriginal and Torres Strait Islander Health Survey found that, in non-remote areas, amphetamine use in the previous 12 months among Indigenous males had increased from 5% in 2002 to 10% in 2004-05, but remained at 5% for Indigenous females (Trewin, 2006a). While the consultation process also referred predominantly to use among Indigenous people in metropolitan centres and larger country towns, concern was expressed regarding remote communities located near major industries (e.g., mining).

The limited evidence base makes it very difficult to determine the need, and if need is identified, the nature of any intervention. However, some people have emphasised the importance of peer pressure. For example, at the 2005 Nimmityjah Consultation Forum, it was reported that peer pressure was a strong influence on Indigenous young people.

Indigenous populations of Australia have been reported as starting using drugs from early to mid-teens, at an age that is generally younger than other Australians (Australian Institute of Health and Welfare, 2005a). In considering this, it is important to note that the median age of Indigenous people is 21 years, compared to the general population of 36 years.

Concern about the spread of methamphetamine in remote Indigenous communities was expressed in consultations and with key law enforcement personnel. These concerns have been raised in a major study of policing implications of illicit drug use in Indigenous communities. Delahunty and Putt (2006) reported that 56% of all police (48% in non-urban areas) stated that local amphetamine use among Aboriginal and Torres Strait Islander people had 'increased' or 'greatly increased' in the past three years. However, non-urban police perceived alcohol (80%), cannabis (44%), inhalants (33%) and petrol (18%) to represent more serious problems for local Indigenous groups than amphetamine (11%).

Consultations in the regional and remote areas suggested that meth/amphetamine represented much less of a problem, with remote communities continuing to struggle with the influx of cannabis and its role in compounding alcohol related problems. It was reported that communities in one region were being affected by amphetamine and there was growing acceptance of amphetamine and of injecting. One consultation noted that meth/amphetamine were in regional towns and around mines, and young Aboriginal people working in the mining industry were being exposed to such use and, as noted earlier, were particularly susceptible to peer pressure. Dealing in drugs was also seen as a way of making money in the absence of employment opportunities. Finally, in some communities concern was raised that some Indigenous women may be drawn to use ATS as a form of self-medication for living in intolerable circumstances.

### Gay, lesbian, bisexual, transgender community

The Sydney Gay Community Periodic Survey 1996-2005 reported that 20% of gay men in Sydney had used crystal methamphetamine in the past six months (Hull, Rawstone et al., 2006a), while the rates among gay men in Queensland, Melbourne and Perth were lower, at between 12-16% (Hull, Brown et al., 2005; Hull, Prestage et al., 2006; Hull, Rawstone et al., 2006b). It has been observed that methamphetamine use is associated with increased sexual activity, particularly among gay and bisexual men and men who have sex with men (MSM). In particular, it has been associated with increased numbers of sexual partners (including high numbers of anonymous partners), increased sexual activity, decreased condom use, and high rates of unprotected vaginal and oral sex (Lee et al., 2007). The associated risks of ATS use among this population are outlined in Chapter 3 ('Effects of ATS').

The Sydney Gay Community Periodic Survey 1996-2006 found that about 47% of the respondents reported use of MDMA in the six months prior to the survey (Zablotska et al., 2006). Other commonly reported drugs included cannabis (38%), powder (26%), cocaine (22%) and crystal methamphetamine (22%). Approximately 4.5% of the men who completed

the questionnaire in February 2006 had injected at least one drug in the six months prior to the survey and the most commonly injected drugs were crystal methamphetamine, speed and steroids (Zablotska et al., 2006).

The AIDS Council of NSW (ACON) has undertaken significant work in addressing drug use for these communities. Research identifies that gay and lesbian people have higher rates of drug use than the general population (Degenhardt, 2005). There are varying reasons as to why this is the case. The written submission from ACON commented that, historically, the gay, lesbian, bisexual, transgender (GLBT) community has met within bars and clubs that can be conducive to the use of alcohol and illicit drugs. In addition, these substances may play a pivotal role in self and community management of the impacts of discrimination and oppression. Predisposing factors in substance use may therefore include increased risk-taking behaviours, higher levels of depression, and a social subculture that incorporates substance use.

Illicit drug use is consistently reported as higher among homosexual than heterosexual females. In relation to drug and alcohol use, homosexual females were significantly more likely to report higher levels of risky drug use compared to heterosexual females (Hillier et al., 2003). This included risky alcohol use (7% compared to 3.9%), marijuana use (58.2% compared to 21.5%), use of other illicit drugs (40.7% compared to 10.2) and injecting drug use (10.8% compared to 1.2%). However, the second national report on the sexuality, health and well-being of same sex attracted young Australians, noted a decline in the use of all drugs between 1998 and 2004 (Hillier et al., 2005). The proportion of those injecting drugs decreased from 11% in 1998 to 4% in 2004, and in 1998 and 2004 young females were more likely to have used marijuana and tobacco and to have injected drugs than young males.

Recommendations for support for this group came from ACON who requested that GLBT be explicitly identified as target groups in the Strategy. ACON cited evidence from the NSW Health (2005) publication, 'Amphetamines, Ecstasy and Cocaine: A Prevention and Treatment Plan 2005-09', and suggested this be reflected in the National Framework. Additionally, ACON recommended that any funding arising for initiatives should include allocation for approaches that specifically target GLBT people and any programs should be developed with community based organisations.

### Use in the workplace

The use of alcohol and illicit drugs in relation to work can compromise safety and productivity as much through mental and physical impairment as through absenteeism. Bywood and colleagues (2006) drew on the 2004 NDSHS survey of 29,445 Australians of whom approximately 50% over 14 years of age were employed to explore the issue of drug use in the workforce. The study found that, in the previous 12 months, those in the paid workforce were more likely to have used illicit drugs (17.3%) than those not in the paid workforce (11.8%). This was true for amphetamine and ecstasy, with use of both these drugs in the previous 12 months reported by around 4% of those in the paid workforce compared to around 2% of those not in the paid workforce. Significantly more male (20.3%) than female (13.4%) workers reported using any illicit drug, and 12% of male and 9.1% of female workers, aged 18-29 years, reported use of amphetamine.

Differences were found according to industry type, with the hospitality industry highest in use of all drug types. The most common industries for amphetamine use were hospitality (9.3%), transport (5.4%), construction (5.2%), agriculture (4.9%) and retail (4.6%). The most common industries for ecstasy were hospitality (10%), finance (5.6%), retail (5.5%), construction (4.7%), manufacturing (4.6%) and wholesale (4.6%). Occupational differences were also found with ATS use reported mostly by tradespeople (6.1% amphetamine, 5.2% ecstasy) and unskilled workers (4.9% amphetamine, 5.6% ecstasy).

Using the Australian and New Zealand Standard Industrial Classification codes to examine more narrowly defined industries, workers in commercial fishing (40.5%) had the highest level of use of at least one illicit drug (Roche, 2007). Other groups reporting relatively high levels of use (30-37%) included employees in motion picture, radio and television services; accommodation, cafés and restaurants; libraries, museums and the arts; and construction trade services (Roche, 2007).

Roche (2007) found a strong association between use of illicit drugs and absenteeism:

Almost 1% of the workforce (1.2% males; 0.7% females) reported taking days off due to their drug use. This was most prevalent among 14-17-old workers, and more common among males than females. Among amphetamines users, absenteeism levels were particularly high with 13.4% of amphetamine users reporting a drug-related day off in the past three months, compared to 4.5% among users of any drug. Workers who use illicit drugs were also significantly more likely to report days off due to any illness or injury in the past three months (48.1% of drug users overall and 56.8% of amphetamine users) compared to workers who report no drug use (p.19).

At one consultation forum, concerns were raised over the potential of the fly in/out work arrangements of some in the mining sector. It was suggested that lengthy periods of recreation leave increased the vulnerability of well-paid employees to amphetamine use and this may represent an emerging trend. Some industries undertake drug screening, provide drug education programs and use employment contracts that make provision for drug treatment or dismissal. However, concern was expressed that some ATS users know how to 'beat' the screening process. One consultation noted that for many people, drug use is 'recreational' (i.e., outside work) rather than occupational, although the workplace can be affected as people move through the cycle of drug-taking and experience the adverse consequences of intoxication and/or 'come down'/'hangover' effects.

It was suggested that there is a need to undertake more research into the nature and impact on health and productivity of employees' drug taking. Measures for dealing with drug taking in the workplace were discussed during the consultations and included innovative approaches of the kind outlined by Harris (2007) and those instigated through some union and non-union workplace agreements. These relate to provision of leave to attend rehabilitation; the implementation of employee assistance programmes; disciplinary, counselling and testing protocols; and zero tolerance policies in industries where employee or public safety is at risk. According to Harris (2007), workplace agreements, particularly in the building and construction, mining, manufacturing and transport industries, increasingly address drug and alcohol issues.

## 2.5 Summary

According to the latest UNODC World Drug Report, Australia has one of the highest rates of methamphetamine and amphetamine use in the world, while ATS production remains greater in other regions. As an indication of use in the general population, the 2004 NDSHS found that 3.2% of the population aged 14 years and over had used methamphetamine and 3.4% had used MDMA in the last 12 months. For both drug types, use was more prevalent among males than females, and most common in the 20 to 29 years age group. While methamphetamine use appears to have stabilised (reported by 3.2% in 2001), use of MDMA significantly increased (2.9% in 2001). Concern was raised during consultations about a perceived 'normalisation' of MDMA use, and the view of it as a relatively harmless and enjoyable drug.

Use of illicit drugs is more prevalent among some population groups, as indicated by Australia's drug monitoring systems. Surveys with offenders (e.g., DUMA) and illicit drug users (e.g., IDRS and EDRS) indicate that use of ATS is common in these samples. Recent survey data suggest that lifetime use of methamphetamine is high among injecting drug users (96%), regular ecstasy users (84%) and detainees (64%). While clearly prevalent among regular ecstasy users, lifetime use of ecstasy is also common among injecting drug users (68%) and detainees (46%). The form of methamphetamine used by injecting drug users varied according to jurisdiction with 'crystal' most common in Canberra, Perth and Sydney, powder most common in Brisbane, Darwin and Melbourne, and base most common in Adelaide and Hobart.

Particular population groups are more vulnerable to the use of illicit drugs, including ATS, with identified at-risk groups including young people, some Indigenous communities, the gay and lesbian community and particular workplaces. The 2004 NDSHS reported around 9% of 18 to 19 year olds had used methamphetamine and ecstasy, while the ASSAD school survey reported for 17 year olds, 7% had used amphetamine and 4% had used ecstasy. Research suggests that ATS-related presentations at youth treatment services are increasing. According to the 2004 NDSHS, Indigenous people were almost twice as likely to be recent users of illicit drugs as other Australians (26.9% versus 15.0%). The National Aboriginal and Torres Strait Islander Health Survey 2004-05 noted that 7% of the sample had used meth/amphetamine. While cannabis and alcohol remain the primary drugs of concern among Indigenous populations, there is some indication of an increase in ATS use both in urban and remote areas. Surveys with the gay community have reported that among homosexual males, up to 20% report use of crystal methamphetamine and 45% use of ecstasy. Data using the 2004 NDSHS found use of both amphetamine and ecstasy in the workforce, with particular prevalence in some industries. Use of both drugs was highest in the hospitality industry, while use of amphetamine was also more common in transport and construction, and ecstasy use in finance and retail. Given the effects of ATS use and related harms, these groups were noted as specific targets for prevention and harm reduction strategies.

# Chapter 3: Effects of Amphetamine-Type Stimulants

## 3.1 Effects for users

The action of amphetamine-type stimulants in the brain elevates levels of the monoamine neurotransmitters dopamine, serotonin (5-HT) and noradrenaline (Rothman & Baumann, 2003). Dopamine is involved in the regulation of movement; cognitive processes related to attention, working memory and motivational behaviour; and is the primary neurotransmitter involved in reward pathways (Tzschenke, 2001). Serotonin has a role in a variety of physiological processes, and in complex behaviours such as mood, appetite, sleep, cognition, perception, motor activity, temperature regulation, pain control, sexual behaviour and hormone secretion (Kema et al., 2000). Noradrenaline is responsible for mediating cardiovascular effects, arousal, concentration, attention, learning and memory (Ressler & Nemeroff, 1999).

As noted, ATS include both meth/amphetamine and MDMA or ecstasy. The difference between these groups of drugs is that MDMA primarily inhibits serotonin reuptake and stimulates serotonin release, while methamphetamine has the same effects on dopamine (Clemens et al., 2007; Dean 2004). The differential release of neurotransmitters by MDMA and methamphetamine results in relatively unique subjective effects produced by each drug. While MDMA is more likely to produce euphoria, mild hallucinations and feelings of closeness to others, methamphetamine is more likely to enhance confidence, energy and sexual stimulation (Clemens et al., 2007; Dean 2004).

The effects of ATS include the sought after effects, and negative short-term and long term consequences. Both the intended and the adverse consequences will depend on the amount taken, purity, physiological factors such as age and general health, individual tolerance to the drug and the context in which the intoxicating effects are experienced.

The sought after effects of meth/amphetamine include a sense of wellbeing, euphoria, mood elevation, increased libido, alertness, reduced fatigue, increased concentration, diminished appetite, enhanced reflexes, and a perceived increase in confidence, energy, and physical strength (AIDS Council of New South Wales (ACON), 2006; Dean, 2004). At relatively low doses, performance of simple motor and cognitive tasks can improve (although performance may deteriorate after larger doses or after regular use) (e.g., Brauer & de Wit, 1997; Rogers et al., 1999). The immediate sought after effects of ecstasy are similar and include a subjective sense of closeness to other people, enhanced sociability, positive mood states, including a sense of wellbeing and euphoria, and changed perceptions, in particular sharpened sensory perception (AIDS Council of New South Wales (ACON), 2006; Dean 2004; Tancer & Johanson, 2001). For ecstasy, the balance of positive to negative effects shifts after a relatively short period of repeated use, possibly acting as a disincentive to frequent use (e.g., Peroutka et al., 1988).

As with the sought after effects, the adverse effects of ATS are dose and frequency related (i.e., their likelihood and intensity increase with increasing dose and increasing use). The short-term adverse effects of meth/amphetamine include: restlessness, irritation,

anxiety, agitation, tremor, teeth grinding, insomnia, confusion, increased heart rate and irregular heart beat, abdominal pain, sweating, dilated pupils, fatigue, and parasitosis (picking and scratching skin) (ACON, 2006; Dean 2004). The short-term adverse effects of ecstasy include racing thoughts, depersonalisation, panic attacks, tremor, muscle cramps, increased heart rate, decreased capacity to cope with changing ambient temperature (which may result in hypo- or hyperthermia), hyperactivity, insomnia and impairment of sexual functioning (Cohen 1998; Dean 2004; Peroutka et al., 1988).

The sought after effects and adverse effects were discussed during consultations. In addition to 'rush' or euphoric experiences, it was noted that ATS are sometimes used to enhance sexual performance and for weight loss. It was also noted that some people might use ATS as self-medication to alleviate distress and anxiety. However, these latter symptoms may in fact become exacerbated following use and during 'come down', which can then result in further use and instigate a binge-crash cycle. It was noted that following 2 to 5 days after abstinence many regular users would experience a lack of energy and enthusiasm, reduced concentration, poor motivation, irritability and possibly anger. Long-term effects mentioned by participants in the consultations included poor diet and nutrition, kidney and heart problems, and high stress levels.

### 3.2 Negative cognitive and psychological effects

There is a range of short-term adverse consequences of ATS use. Some of the more serious mental health consequences of meth/amphetamine use are sleep disorders, psychosis, paranoid hallucination, agitation, confusion, severe panic, anxiety and depression (Dean, 2004). Many studies have documented reduced mood and feelings of anxiety in the few days following MDMA use (Curran, 2000). Other common side effects in the few days following ecstasy use include insomnia, drowsiness, depression and difficulty concentrating (Morgan, 2000). More limited research is available on the long-term adverse consequences, but it appears that long term users report lack of sleep, severe fatigue, reduced resistance to disease, psychological problems (panic attack, paranoia, hallucinations etc), mood swings and violence (Allen & Tresidder, 2003).

It is difficult to monitor the trends in harms associated with ecstasy use by using routine data sources, as many of these do not differentiate ecstasy from other ATS. While the relative lack of specific long-term research on the effects of ecstasy means it is less conclusive and more contentious, it is generally accepted that, particularly at high doses, some problems will result, including memory and cognition problems, and depression. As stated by Hammersley and colleagues (2002):

There is considerable ignorance coupled to considerable apprehension about the long-term effects of Ecstasy. It is ironic that the very area that users are most concerned about is also the very area that medical, or other, science is least able to help with information" (p.156).

## Cognitive deficits

Despite grounds to be concerned about the cognitive impact of long term ecstasy use, definitive evidence is lacking (Turner & Parrot, 2000). Studies of MDMA users, particularly heavy users, report poorer function on cognitive tests involving working memory and executive function. In a recent review of the literature, Parrott (2006) stated that objective deficits in working memory, attention, frontal-executive function and episodic memory tasks had been found in heavy ecstasy users. Other studies have found deficits in tests of logical reasoning and serial addition (McCann et al., 1999; Parrott et al., 1998). From a review of the literature, Morgan (2000) found evidence of selective impairment of episodic memory, working memory and attention. Such cognitive effects may be long-lasting. For example, Thomasius and colleagues (2006) found that verbal memory deficits in ex-ecstasy users did not improve even after 2.5 years of abstinence.

Neurocognitive deficits have been found in samples of amphetamine users. Research in Western Australia, with a sample of dependent amphetamine users attending an outpatient clinic, assessed a range of cognitive abilities including information processing speed, attention, learning, memory and executive functions (Collins, Dyer & Fox, unpublished). The study found that, relative to published normative data, all the amphetamine users exhibited some form of deficit on the cognitive skills evaluated and performed significantly below expectations according to a measure of pre-morbid intelligence (Collins, Dyer & Fox, unpublished).

With regards to methamphetamine use, research shows that long-term exposure can result in pronounced neuropsychological deficits, with the most consistent and profound impairments observed in working memory, attention and executive function (Barr et al., 2006). Research to date has demonstrated specific deficits associated with prolonged methamphetamine use in tasks of auditory discrimination, auditory vigilance (London et al., 2005), working memory and word recall (Chang et al., 2005; Thompson et al., 2004). Attentional deficits have also been observed and may be related to decreased cognitive inhibition (Salo et al., 2002), and attending to irrelevant task information (Nordahl et al., 2003). Finally, as demonstrated by performance on the Stroop Interference Task, methamphetamine use can have adverse effects on domains of executive function, including abstract reasoning, planning and behavioural flexibility (Kalechstein et al., 2003).

It is important to note that research with ATS users is often confounded by polydrug use in these samples and the possibility of pre-existing psychological problems that make it difficult to draw strong conclusions. In particular, caution is recommended in interpreting data pertaining to long-term cognitive effects of ecstasy use, as use of this drug is most often seen in the context of polydrug use and the role of concomitant cannabis use in any cognitive impairment is yet to be adequately addressed (Croft et al., 2001).

## Depression and anxiety

Symptoms associated with both depression and anxiety have been linked with ATS use. For example, from a review of the literature, Morgan (2000) concluded that there was growing evidence that chronic, heavy, recreational use of ecstasy is associated with sleep disorders, depressed mood, persistent elevation of anxiety, impulsiveness and hostility. Furthermore, the relationship between depressive/anxious symptomatology and ATS use

may be stronger than the link with psychosis. For example, a recent study in Victoria found that up to 85% of amphetamine users may suffer from depression and/or anxiety compared to 7% who showed psychotic conditions (Nutting et al., unpublished).

Both the 2004 National Drug Strategy Household Survey (NDSHS) and the 2006 Ecstasy and Related Drugs Reporting System (EDRS) included the Kessler Psychological Distress Scale (K10; Kessler et al., 2002) to measure the level and severity of symptoms of depression and anxiety among survey participants. It is important to counsel caution in comparing the findings because criteria for drug use and diagnostic cut-off scores differed between the surveys. In the NDSHS, those who had used the drug at least once in the previous month had the following K10 scores: for meth/amphetamine, 36% were low risk, 33% medium risk, 21% high risk and 10% very high for psychological distress; for ecstasy, 44% were low risk, 34% medium risk, 16% high risk and 6% very high risk for psychological distress (Australian Institute of Health and Welfare, 2005a); among the 2006 EDRS sample, who completed the K10, just over half (55%) scored in the medium risk range, followed by low risk (38%) and high risk (7%) (Dunn et al., 2007).

As already noted, investigating psychiatric problems associated with ecstasy is difficult due to high rates of polydrug use among those presenting with psychiatric symptoms and the possibility of pre-existing problems. To date, most research has investigated the proposed link between MDMA use and depression due to the common influence on serotonin levels in the brain. Sumnall and Cole (2005) conducted a meta-analysis of 25 studies investigating depressive symptomatology in 'recreational ecstasy users'. A small association between ecstasy use and depressive symptomatology was found, but considered unlikely to be clinically relevant. The authors also highlighted their observation that drug histories were often poorly reported and polydrug use was mostly not controlled. A study by Roiser and Sahakain (2004) compared current and ex-ecstasy users with polydrug users who had never used MDMA and found no significant differences between the groups.

A recent study by Guillot and Greenway (2006) found no significant differences in depressive symptomatology on the Beck Depression Inventory-II (BDI-II; Beck et al., 1996) between heavy ecstasy users and ecstasy naïve college students. In addition, most ecstasy users who were diagnosed with a psychiatric disorder reported that the diagnosis preceded their use of the drug. A study by Soar, Turner and Parrott (2006) also considered premorbid psychiatric history in relation to the degree of self-reported problems attributed to ecstasy use. It was found that 'problematic ecstasy users' scored significantly higher than 'nonproblematic ecstasy users' on somatisation, depression, anxiety and negative psychobiology. 'Problematic ecstasy users' also reported significantly higher levels of use, and personal and family psychiatric histories.

From their review of the literature on psychiatric sequelae attributed to ecstasy use, Gowing and colleagues (2001) concluded that:

Overall, these reports indicate a clear association between ecstasy use and subsequent short-term mood changes. More severe psychiatric sequelae, including depression, panic disorders, psychoses and anxiety, may occur but probably only in those individuals made vulnerable by personal or family history of psychiatric disturbance, by stress or by concurrent use of other drugs (p.34).

Thus, the exact nature of the relationship is complex and more research is needed to determine the causal pathways between mental health problems and ATS use. Specifically, mental health problems may pre-date and exist independently of ATS use, ATS use may contribute to the onset of mental health problems, or there may be a common and shared cause (Baker & Dawe, 2005).

Psychological problems have also been identified in samples of injecting drug users (IDU). Among the sample for the 2006 Illicit Drug Reporting System (IDRS), the majority reported methamphetamine as the drug most often injected in the last month (33%) and the last drug injected (30%) (O'Brien et al., 2007). While mental health problems were not analysed according to the primary drug used, 38% of the total sample reported experiencing a mental health problem other than drug dependence in the last six months. The most commonly reported problem was depression (27%) followed by anxiety (14%).

## Psychosis

One of the possible consequences of ATS use, in particular methamphetamine, is the causal role in inducing a psychotic state. This association has been widely publicised in both the media and in academic research. Research has comprised of human experiments (in the 1970's that involved giving participants doses of methamphetamine in order to induce psychotic symptoms), animal experiments, case reports, surveys of drug users, and imaging studies (to detect neurological structural changes). Despite efforts to explicate the nature of the association between methamphetamine use and psychosis, in general it has been concluded that it remains unknown how acute or enduring the status of psychosis is (Kingswell, 2007).

Heavy users of ATS typically use less regularly than opiate users and 'binge' over a period of a few days and nights, often followed by the use of drugs such as benzodiazepines or other sedatives to 'come down' (Darke et al., 2000). Such bingeing can induce a temporary psychosis identical in symptoms to an episode of paranoid schizophrenia, and this psychosis can be reliably induced in people with no history of, or predisposition towards, mental illness (Darke et al., 2000). ATS use can also severely exacerbate psychotic symptoms in those already experiencing a psychotic state of some form (World Health Organisation, 1997).

A presentation at a recent Australian conference reported that those at greatest risk of methamphetamine-induced psychosis had a predisposition to mental illness, consumed the drug at higher doses, preferred injecting or smoking the drug and had an earlier age of initiation (Heffernan, 2006). Research conducted by Chen and colleagues (2003) compared pre-morbid characteristics and psychiatric co-morbidity among 445 methamphetamine users with and without a lifetime diagnosis of methamphetamine psychosis. Results were that those with the diagnosis were younger at first methamphetamine use, used larger amounts of methamphetamine, had significantly higher scores on the Premorbid Schizoid and Schizotypal Traits questionnaire (Foerster et al., 1991), and higher rates of major depressive disorder, alcohol dependence and antisocial personality disorder.

Research into the association between amphetamine use and psychosis has been conducted both in Australia and internationally. A cross-cultural study conducted by

Srisurapanot and colleagues (2003) sampled methamphetamine-induced psychotic inpatients in Australia, Japan, Philippines and Thailand. This research found that persecutory delusion was the most common lifetime psychotic symptom, followed by auditory hallucinations, strange or unusual beliefs and thought reading. Auditory hallucinations were the most common current symptom, followed by strange or unusual beliefs, and visual hallucinations.

Another international study, sponsored by the World Health Organisation (WHO), involved data collection at four centres in the Asia-Pacific region – Australia, Japan, Philippines and Thailand (Ali et al., 2006). Very few similarities were found across the sites regarding extent, patterns and routes of methamphetamine administration. Australian participants were reported as the most experienced drug users in terms of lifetime number of drugs used and the age of onset for methamphetamine use. Australian and Japanese methamphetamine users predominantly injected the drug, while those from the Philippines and Thailand almost exclusively smoked the drug. While Australian participants had the highest prevalence of morbid depression, symptoms of psychosis were comparable between countries, with delusions being the most commonly experienced symptom. While very few participants in other countries reported past psychological treatment (aside from methamphetamine-induced psychosis), over 60% of the Australian sample had received some form of treatment.

A recent study conducted in Sydney concluded that the prevalence of psychosis among a sample of current methamphetamine users was 11 times higher than among the general population of Australia (McKetin et al., 2006a). Among the 309 methamphetamine users interviewed, 13% screened positive for psychosis, and 23% had experienced a clinically significant symptom of suspiciousness, unusual thought content or hallucinations in the past year. Those defined as dependent methamphetamine users were three times more likely to have experienced psychotic symptoms than their non-dependent counterparts, even after adjusting for history of schizophrenia and other psychotic disorders.

One of the primary issues raised during consultations concerned the psychotic symptoms induced by methamphetamine use, including associated acts of aggressive and violent behaviour. In addition to the contributing factor of increased purity of more recent formulations of meth/amphetamine, it was suggested that some consumers may be predisposed to violence and psychosis. This was in reference to the observation that while some regular users do not exhibit these behaviours, an occasional user may experience a psychotic episode.

### 3.3 Dependence and adverse outcomes

ATS users can become dependent and ATS dependence is associated with a range of physical and mental health problems. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association, 2000), dependence is characterised by experience of at least three of the following symptoms:

- tolerance, which is defined as either a need to use larger amounts of the substance to achieve desired effect, or decreased effect with continued use of the same amount;
- withdrawal;

- increased dosage and duration of the substance use;
- unsuccessful attempts to cut down or control substance use;
- increased time spent to obtain the substance, use the drug or come down from the drug;
- giving up social, occupational and recreational activities because of substance use; and
- continued substance use despite awareness of its negative consequences (e.g., physical or psychological problems).

It has been estimated that the number of regular methamphetamine users in Australia is 102,600 and of these, 72,700 have been estimated to be methamphetamine dependent (McKetin et al., 2005). It has been suggested that the newer crystalline form of methamphetamine may lead to greater dependence compared to other forms. This issue was recently investigated in a sample of 309 regular methamphetamine users in Sydney (McKetin, Kelly & McLaren, 2006). Using the Severity of Dependence Scale, this study found that participants who had used crystal methamphetamine in the past year were significantly more likely to be dependent on methamphetamine compared to those who had only taken other forms of methamphetamine during this time. Furthermore, methamphetamine dependence was found to be associated with injecting or smoking as methods of use, using more than weekly, and a history of use over 5 years. Even after adjusting for these patterns of use, crystal methamphetamine use remained significantly associated with methamphetamine dependence.

A study by Kalechstein and colleagues (2003) produced the first findings to demonstrate that methamphetamine dependence is associated with impairments across a range of neurocognitive domains. Methamphetamine dependent users abstinent for 5 to 14 days performed significantly worse than controls on neurocognitive measures sensitive to attention/psychomotor speed, verbal learning and memory, and executive systems measures sensitive to fluency. These differences were not attributable to demographics, estimated premorbid IQ, and level of self-reported depression. Research investigating the methamphetamine market in Sydney found that dependence on methamphetamine was the key predictor of poor physical and mental health among users (McKetin, McLaren & Kelly, 2005).

Other recent research has added to the understanding of the relationship of meth/amphetamine dependence to adverse outcomes. For example, Dyer and Cruickshank (2005) explored the psychological profile among 218 admissions to an inpatient methamphetamine detoxification program. It was found that approximately 46% of methamphetamine-dependent inpatients had been previously diagnosed for a psychological health problem, with approximately 30% requiring admission to a psychiatric hospital. In a second study the Beck Depression Inventory II (BDI-II; Beck et al., 1996) was administered to 367 outpatients receiving treatment for methamphetamine or heroin dependence. The mean total BDI-II score was reported to be in the moderate range. It was found that methamphetamine-dependent patients' total BDI-II score was similar to that of psychiatric outpatients with clinical depression, but significantly greater than psychiatric outpatients with anxiety disorders.

Psychiatric problems appear to occur predominantly among dependent methamphetamine users, rather than among those who take the drug infrequently. To further illustrate this, a recent Australian conference was presented with research conducted with a large community sample of amphetamine users in Queensland (Conroy, 2006). It was noted that 42% of those who were amphetamine dependent, compared to 21% of non-dependent amphetamine users, had recently experienced moderate to severe mental health disability. Overall, dependent users had higher levels of depression and anxiety, more easily lost their temper and had poor relationships.

Based on their own research and a review of the literature, McKetin and Mattick (1997) concluded that:

Dependence on amphetamine has been associated with poor psychological health, especially in younger individuals who frequently use large amounts of amphetamine.... Psychological problems reported by amphetamine users included feeling scattered, vague, distracted and problems with concentration that impeded work performance or study....The results of this study show that severely dependent amphetamine users suffer from poor memory and concentration, performing from half to one standard deviation worse on WMS-R indices than less dependent amphetamine users. This study also found preliminary evidence that a history of heavy amphetamine use, particularly injecting more than 3-4 days per week, was associated with impairment of visual memory tasks (pp.235, 240).

### 3.4 Negative physical health effects

ATS use in the short term can lead to increases in heart rate, hypertension, irregular body temperature and rates of breathing, constriction of blood vessels and cardiac arrhythmia (Lineberry & Bostwick, 2006; Maxwell, 2005). Short- and long-term ATS use can impact on the cardiovascular system (increasing heart rate, increasing blood pressure, cause arrhythmia and palpitations) sometimes resulting in cardio and/or cerebrovascular crises, such as myocardial infarction or stroke, aneurysm and hemorrhage (e.g., Buxton & McConachie 2000; Hung et al., 2003). Acute coronary syndrome is common in patients hospitalised for chest pain after methamphetamine use (Turnipseed et al., 2003).

ATS can impact on the ability to regulate body temperature in a changing environment, contributing to hyperthermia, and metabolic disturbances are not uncommon (see Gowing et al., 2002). Methamphetamine induces dose-dependent brain hyperthermia that precedes, and is greater than, overall body hyperthermia, suggesting methamphetamine-induced neuronal activation is a contributing source of that hyperthermia (Brown et al., 2003). ATS suppress the appetite, and can be associated with weight loss and general poor nutrition. Less common problems include renal and hepatic problems (see Allen & Tresidder, 2003; Gowing et al., 2002; Maxwell, 2005). Maxwell (2005) also reported that many longer-term ATS users experience a range of health problems that adversely affect their general well being. Such problems include: poor dental hygiene including damaged and discoloured teeth from dry mouth, heavy sugar intake and tooth grinding; appearing older than chronological age; and skin lesions – excoriations and ulcers from parasitosis.

As indicated earlier, evidence suggests that ATS impact on cognition and this may be

associated with particular neurological consequences, which sometimes may endure even after abstinence (e.g., Davidson et al., 2001). It is postulated that long-term deficits could result from the capacity of MDMA and methamphetamine respectively to exhaust serotonergic and dopaminergic neurons (Clemens et al., 2007). These can include short and long-term consequences such as hyperactivity, confusion, agitation, low mood, lethargy, and anhedonia (see Baker, Lee & Jenner, 2004).

### Toxicity and overdose

As reviewed in Dean (2004), toxic central effects of amphetamine use include psychosis, hyperthermia, seizures, and rhabdomyolysis (an acute, potentially fatal disease that destroys skeletal muscle), while cardiovascular toxicity includes ventricular arrhythmias, acute myocardial infarction and cardiomyopathis. Neurotoxicity refers to neurological changes that persist after cessation of use, and evidence suggests that chronic methamphetamine use leads to dopamine depletion and possibly also changes in serotonergic function (Davidson et al., 2001).

There is also evidence that MDMA can produce neurotoxic effects in some users. From a review of the literature, Morgan (2000) found several cognitive and psychological effects from ecstasy use (outlined above) and suggested a likelihood that some of these problems are caused by ecstasy-induced neurotoxicity. Morgan (2000) found support for this from preclinical evidence of MDMA-induced neurotoxicity and behavioural deficits, evidence of depleted serotonin in heavy ecstasy users, and by dose-response relationships between the extent of exposure to ecstasy and the severity of impairments. Boot and colleagues (2000) suggested that those ecstasy users most at risk of neurotoxicity are those who consume two or more ecstasy tablets at a time, use the drug fortnightly or more, inject MDMA, and use for more than 24 hours.

Severe MDMA overdoses are associated with intense sympathomimetic responses, active hallucinations, and thermoregulatory, neurologic, cardiovascular, hepatic and electrolyte disturbances (Gowing et al., 2002). Neurological symptoms include agitation, hallucinations, seizures, coma, and acute and chronic psychiatric symptoms (Kalant, 2001). To date, there are few studies that support the notion that MDMA causes neuronal cell death but rather, it appears to damage only the terminal regions of 5-HT neurons (Baumann et al., 2007). In general, there is considerably more evidence of long-term damage following chronic use of methamphetamine (Pubill et al., 2003).

ATS overdose can occur and is associated with circulatory collapse, cerebral hemorrhage and myocardial infarction (World Health Organisation, 1997). The most recent EDRS reported that 21% of the national sample had ever overdosed on ecstasy or related drugs (Dunn et al., 2007). Overdose was defined as 'passed out or fallen into a coma'. The majority reported recently overdosing on ecstasy (36%), while 3% each reported overdosing on crystal methamphetamine and base. Data from the Australian Institute of Health and Welfare (AIHW) report the number of inpatient hospital admissions per million persons among persons aged 15 to 54 with a principal diagnosis relating to amphetamine. These figures have fluctuated during the six-year period from 1999/2000 to 2004/05. The latest figures show a decrease from 180 per million persons in 2003/04 to 156 per million persons in 2004/05 (Australian Institute of Health and Welfare, 2005b).

In 2005, there was a total of 68 drug induced deaths in which methamphetamine was mentioned among those aged 15 to 54 years, compared to 75 in 2004 (Degenhardt & Roxburgh, 2007). Of these deaths, methamphetamine was found to be the underlying cause in 26 cases in 2005 compared to 17 in 2004. Deaths from ecstasy consumption have variously involved persons with pre-existing cardiac conditions (World Health Organisation, 1997), hyperthermia, and ingestion of excessive amounts of water (Darke et al., 2000). Deaths following MDMA use are frequently the consequence of a serotonin syndrome and/or of sympathomimetic overstimulation, both of which are exacerbated by environmentally caused overheating (Schifano, 2003).

A study conducted by Schifano and colleagues (2003) investigated the number of ecstasy-related deaths occurring in England and Wales between August 1996 and April 2002 recorded in the National Programme on Substance Abuse Deaths database. A total of 202 ecstasy-related deaths were recorded and showed a steady increase in the number of deaths each year. Of these, ecstasy was implicated as the sole drug causing death in only 17% of cases, with a variety of other drugs (mostly alcohol, cocaine, amphetamine and opiates) being identified. Toxicology results revealed MDMA accounted for 86% of cases, MDA for 13% of cases, and single deaths were associated with MDEA and PMA. An analysis of ecstasy-related deaths in Australia during 2000-2004 using data from the National Coronial Information System (NCIS) found 112 such deaths (Fowler et al., in press). Ecstasy was deemed to be the primary contributory factor in just under half of these cases, and the sole drug present in only six of these deaths (Fowler et al., in press).

### Negative effects of specific routes of administration

Some effects are associated with specific routes of administration, as detailed at the National Leadership Forum on Ice (Ministerial Council of Drug Strategy Joint Communiqué, 2007). Nasal use by snorting has a delayed effect of approximately five minutes subsequent to dose. There is a potential risk for Hepatitis C to be passed on from tiny, often invisible amounts of blood on shared snorting equipment. Oral use of crystal methamphetamine by swallowing can cause irritation as crystal particles travel to the stomach. Anal and vaginal use, known as 'shelving' and 'shafting', can damage the lining of the anus or vagina and increase the chances of HIV and Hepatitis C transmission. In addition to the typical health and medical effects associated with smoking including addiction, smoking equipment can cause burns to mouth or gums, and Hepatitis C can be transmitted if equipment is shared. In addition to smoking, injecting is the route of administration most associated with dependence, and the latter mode of administration poses risks of contracting blood borne viruses, and repeated injection in the same spot can lead to vein inflammation, scarring, abscesses, blood clots and vein collapse.

There is a paucity of research investigating transitions to injecting from other routes of administration. Those studies that have investigated this area have mostly recruited heroin users (e.g., Gossop et al., 1988; Neaigus et al., 2001; Parker et al., 1988). A paper by Strang and colleagues (1992) identified the pertinent issues, including variations of route of administration by time and place; influence of availability of drug paraphernalia; influence of context; and the association between changes in route of one drug and changes in route of other drugs.

One study that investigated transitions to injecting among amphetamine users was conducted by Darke and colleagues (1994). A sample of 301 regular amphetamine users was interviewed and two thirds reported injecting the drug in the previous six months. A transition to regular amphetamine injecting from other routes of administration was reported by 40% of participants, with males twice as likely to report such a transition. The main reasons provided were 'liking the rush' from injecting, and a perception that it was both more economical and a healthier way to use.

The 2006 EDRS reported that 20% of the national sample of regular ecstasy users (REU) had ever injected any drug and of these, 69% had injected in the previous six months (Dunn et al., 2007). Those who reported lifetime injecting first injected at a median age of 18 years and had been injecting for a median of eight years. Amphetamine ('speed') was the most common drug first injected (48%) and ever injected (84%). Crystal methamphetamine was reported as the most common drug injected in the previous six months (72%) and the most common drug last injected (35%).

Among the 2006 EDRS sample, lifetime injectors compared to non-injectors were significantly more likely to be older, male, have fewer years of education, have a prison history, be unemployed, be in drug treatment, and be less likely to identify as heterosexual. With regards to initiation into injecting, 43% of injectors reported doing so for the first time while under the influence of other drugs; most commonly alcohol and cannabis.

### 3.5 Negative behavioural and social effects

Several adverse effects can arise from behaviours associated with ATS use. Sexual risk taking, driving while impaired and polydrug use have been associated with both meth/amphetamine and ecstasy use, while aggressive and violent behaviours are more often associated with methamphetamine use. Riley and colleagues (2001) identified the main risks for young people who use ecstasy as polydrug use (85%), driving while intoxicated (35%) and unprotected sex (30%).

#### Polydrug use

Meth/amphetamine and ecstasy users are frequently described as 'polydrug users', referring to frequent use of other drugs. Sometimes other drugs are used separately to ATS, sometimes simultaneously (e.g., alcohol) and sometimes to manage some of the adverse effects of ATS use (e.g., drugs used to manage the 'crash'). The 2004 NDSHS found that across all reported drugs, recent ATS users had substantially higher rates of polydrug use than non-ATS users, including three times the rate of smoking and almost ten times the use of cannabis (Australian Institute of Health and Welfare, 2005a). It was reported that 87% had consumed alcohol, 68% had used cannabis and 49% had used MDMA with methamphetamine on at least one occasion. Thirty eight percent reported alcohol use as a substitute when methamphetamine was not available, while 24% nominated MDMA as the next most common substitute. With regards to MDMA users, the 2004 survey noted that 83% had consumed alcohol with MDMA on at least one occasion, 57% had used cannabis with MDMA and 39% had used methamphetamine with MDMA. Alcohol was nominated by 42% as the preferred substitute when MDMA was not available, followed by 24% nominating methamphetamine as their next most common substitute.

The most recent EDRS survey found that among REU, 99% reported lifetime use of alcohol and 96% reported use of alcohol in the previous six months (Dunn et al., 2007). Similarly, 98% reported lifetime cannabis use and 83% reported cannabis use in the previous six months. More than three-fifths of the sample reported lifetime 'speed', crystal methamphetamine, cocaine and LSD use; more than one-third reported recent use of crystal methamphetamine, base and cocaine. Of the total sample, 93% reported usually using other drugs with ecstasy and 80% to 'come down' from ecstasy. Alcohol was the most common drug reportedly used with ecstasy (75%), followed by tobacco (64%) and cannabis (45%). Cannabis was the most commonly reported drug used during 'come down' (70%), followed by tobacco (64%) and alcohol (41%). Rates of methamphetamine use with ecstasy were low, with speed the most common (27%), and less than 10% reported using a form of methamphetamine during 'come down'.

Focus group discussions among ecstasy users have also found that combining ecstasy use with alcohol was the most commonly reported risk behaviour (Shewan et al., 2000). In addition, other drugs, most notably cannabis, LSD and amphetamine, were also reportedly used over the course of a typical evening. As already noted, combined alcohol and amphetamine use is relatively common, with up to 60% of those meeting diagnostic criteria for an amphetamine use disorder also meeting criteria for an alcohol use disorder (Burns & Teesson, 2002). Furr and colleagues (2000) found an association between alcohol intoxication and methamphetamine smoking, and suggested that heavy drinkers may use amphetamine to counteract the performance deficits caused by alcohol consumption. Reports of concurrent use of cannabis and benzodiazepines have also been commonly found among amphetamine users (Baker et al., 2004).

Methamphetamine and ecstasy are increasingly used in combination, yet little is known of the effects of this combination. Clemens and colleagues (2004) recently conducted research with rats to investigate the behavioural, thermal and neurotoxic effects of MDMA and methamphetamine when given alone or in combined low doses. The researchers concluded that these drugs used in combination may have greater adverse acute effects, including acute head-weaving (moving head from side to side) and hyperthermia, and long-term effects, including decreased social interaction, increased emergence anxiety and dopamine depletion, than equivalent doses of either drug alone. In a subsequent article summarising the research to date, Clemens and colleagues (2007) reported that animal models suggest: a tendency for more compulsive use of methamphetamine over MDMA; unique pro-social effects of MDMA; modulation by high temperatures in the rewarding effects of both drugs; functional and emotional impairments associated with both drugs; and likely synergistic adverse effects when used in combination.

Polydrug use was one of the themes that emerged from the consultations. The impact of polydrug use, particularly alcohol use in conjunction with ATS, was raised as a potential contributor to ATS related aggression and violence. At one of the consultations it was noted that polydrug use was prevalent in rural and remote communities, in particular the use of illicit drugs with alcohol. There was consensus and considerable concern that polydrug use had a significant impact on treatment outcomes. Polydrug use could also contribute to shifts in patterns of drug use. For example, a number of participants expressed concern that attempts to manage ATS problems might 'shift the problem to use of other drugs'. A written

submission from the Australian Drug Foundation (ADF) highlighted the development of new forms of drugs in response to effective law enforcement measures that would require:

a quick response, early warning information system to circulate information to those who need it most; the users and frontline health and emergency staff.

## Driving risk

Drug driving is generally accepted as:

driving under the influence of alcohol or any other drug to the extent that one is unable to demonstrate appropriate control over a motor vehicle (Davey et al., 2005, p.62).

Brookhuis and colleagues (2004) used an advanced driving simulator to assess acute effects of MDMA on simulated driving behaviour and heart rate. Regular ecstasy users completed test rides in the driving simulator shortly after use of MDMA (prior to attending a rave) and were tested again after attending the rave while under the influence of MDMA and several other drugs. Participants were also tested when sober at a comparable time of night. Driving performance, as assessed by lateral and longitudinal vehicle control, was not greatly affected after MDMA use (prior to the rave), but showed deterioration after multiple drug use. The authors suggested that the most alarming result was the decreased perception of risk taking after both MDMA and other drug use with regards to unsafe driving and accident involvement.

As reviewed by Sheridan and colleagues (2006), injury associated with methamphetamine use is most commonly related to driving and violence. A number of Australian studies were reviewed including a 10-year multi-centre study conducted by Drummer and colleagues (2003). This research, of drugs in drivers killed in Australia, found that 4.1% of the 3398 cases had stimulants in their blood. Furthermore, while only 3.4% of car drivers tested positive, 23% of truck drivers tested positive to stimulants.

The National Drug Law Enforcement Research Fund (NDLERF) recently funded a large-scale prospective study of the incidence and severity of drug- and alcohol-related trauma in South Australia, including driving-related trauma (Griggs et al., 2007). Samples were taken from trauma patients presenting to the Royal Adelaide Hospital Trauma Service or Emergency Department. Across the two hospital groups, motor vehicle crashes were the leading cause of presentation to the hospital following trauma, accounting for 70.2% of presentations. Among these, 38.4% were positive for alcohol or other drugs. Meth/amphetamine was found in 6.9% of injured car drivers.

Of police detainees who self reported driving during the 12 months prior to detention, 55% stated they had driven following the use of illicit drugs, with 30% reporting driving after the use of meth/amphetamine (Mouzos et al., 2006). Of these, 58% had used cannabis and 50% had used amphetamine and driven at least once a week after using the drug. An increase in the incidence of drug driving was associated with a decrease in the incidence of drink driving. Many reported uncertainty about the legality of drug driving (52% were unlicensed), were generally unconcerned about driving, and were not deterred from driving through fear of detection. Just under a quarter (22%) believed amphetamine had a positive effect on driving compared to 15% for cannabis and 7% for heroin (see Table 3.1). Nicholas (2003) suggests that meth/amphetamine users may be attracted to police pursuits for the

same reasons they use the drugs - a desire for excitement and risk-taking behaviour and raised levels of aggression.

**Table 3.1: Perceptions of adult police detainees of the effects of drug use on their driving**

	Worse		Better		Same as normal	
	n	%	n	%	n	%
Alcohol only	72	62	12	10	32	28
Cannabis	37	44	15	18	32	38
Cocaine	3	50	0	0	3	50
Heroin	14	61	1	4	8	35
Amphetamine/methamphetamine	39	49	20	25	20	25
Benzodiazepines	20	83	1	4	3	13
Alcohol and any of these drugs	51	65	11	14	16	21

Source: AIC, DUMA collection 2006

The 2004 NDSHS found that of Australians aged 14 years and over who had used illicit drugs in the past 12 months, one in four (23%) had driven a motor vehicle after they had used illicit drugs (Australian Institute of Health and Welfare, 2005a). This was more common for males than females. In contrast, one in six persons (16.1%) had driven a motor vehicle after they had consumed alcohol (translating to 2.2 million people, consisting of approximately 1.5 million males and 0.7 million females).

The 2006 EDRS reported that of those who had driven a car in the previous six months, 77% had driven within one hour of taking an illicit drug on at least one occasion (Dunn et al., 2007). Of these, 78% reported driving after taking ecstasy, 34% after amphetamine ('speed'), 26% after crystal methamphetamine, and 15% after base methamphetamine. Participants who had driven a car in the preceding six months were asked to indicate how impaired a person's driving ability would be under the influence of various drugs. For ecstasy, the majority indicated that driving under the influence of ecstasy would carry a 'moderate risk' (42%) or 'high risk' (31%). For methamphetamine, the majority indicated that driving under the influence of methamphetamine would carry a 'low risk' (36%) or 'moderate risk' (26%).

The 2006 IDRS also enquired about driving risk behaviour and of those who had driven recently, 78% reported driving after taking an illicit drug (O'Brien et al., 2007). Among this group, 30% reported driving after taking speed, 23% after crystal methamphetamine and 14% after base.

Several jurisdictions have now introduced random roadside drug testing and comments were made in reference to this during consultations. Specifically, this was noted as providing an opportunity to deter drug impaired driving and for ATS early interventions. ATS are among the most common drugs identified in road-side drug testing and it is likely that many people thus identified (e.g., youth out late at night, transport industry staff) might not otherwise come into contact with health and community services.

## Sexual behaviour

ATS, and particularly methamphetamine, have been linked with increased libido and decreased disinhibition. Among those in the 2006 EDRS who reported engaging in penetrative sex, the majority (85%) reported using drugs during sex in the previous six months (Dunn et al., 2007). Among this sample, 83% reported using ecstasy, 18% reported speed use and 16% reported use of crystal methamphetamine on these occasions. Use of protective barriers during sex when combined with drug use was similar to protective use in general, and more common with casual (50%) than regular (19%) partners.

Molitor and colleagues (1999) compared the sexual risk behaviour among a sample of injecting methamphetamine users to injecting drug users never using methamphetamine. Results indicated that male methamphetamine injectors had more sex partners and participated in more acts of anal intercourse with casual partners and vaginal intercourse with regular and casual partners than their counterparts. Female methamphetamine injectors engaged in more acts of vaginal intercourse with regular partners than their counterparts. Furthermore, male methamphetamine injectors reported trading sex for money or drugs, and were less likely to use condoms than their counterparts. Lastly, methamphetamine use also correlated with using shared needles or syringes and not always disinfecting needles or syringes.

Heterosexual ATS users have been reported to engage in more risky sexual behaviours including multiple sexual partners, anonymous partners and unprotected sex (Lineberry & Bostwick, 2006). In a study exploring sexual risk behaviours among a sample of 139 HIV-negative, heterosexual methamphetamine users, participants reported using condoms for vaginal sex about one third of the time (Semple et al., 2004). In contrast, condoms were used for anal sex about one quarter of the time, and 7% of the time for oral sex. A United States study examining the sexual behaviours of 1011 males found 15.6% reported recent or past methamphetamine use (Krawczyk et al., 2006). Recent methamphetamine users were more likely to have casual or anonymous female sex partners, multiple partners, partners who injected drugs, and received drugs or money for sex with a male or female partner. However, while there is evidence for a link between methamphetamine dependence and unprotected sex, McKetin and colleagues (2005) argued that this may be due to the associated lifestyle of these persons rather than due directly to the pharmacological effects of methamphetamine.

There is proportionally more research into sexual risk behaviour and methamphetamine use among homosexual populations. Research in the United States suggests that methamphetamine use is endemic to urban gay and bisexual men (Halkitis et al., 2001). Research also consistently shows an association between methamphetamine use and HIV infection, likely to be a result of the high-risk sexual behaviours in conjunction with the drug use (Reback, 1997; Worth & Rawstorne, 2005). In Australia, figures from the Sydney Gay Community Periodic Survey 1996-2005 reported that 20% of gay men in Sydney had used crystal methamphetamine in the previous six months (Hull, Rawstorne et al., 2006a). In Queensland, Melbourne and Perth, the rate among gay men is reportedly lower, at between 12-16% (Hull, Brown et al., 2005; Hull, Prestage et al., 2006; Hull, Rawstorne et al., 2006b).

Shoptaw and Reback (2007) reviewed the available literature on the epidemiology of methamphetamine use in men who have sex with men (MSM), methamphetamine use and risk behaviours for sexually transmitted infections and potential interventions to prevent and respond to these risks. It was found that methamphetamine use was highly prevalent in MSM and there were strong associations observed between methamphetamine use and HIV-related sexual transmission behaviours. Behavioural treatments, from brief interventions to intensive out-patient treatments, produced sustained reductions in methamphetamine use and concomitant sexual risk behaviours among methamphetamine-dependent MSM.

While more research has been conducted into methamphetamine use among homosexual populations, few studies have directly compared methamphetamine users according to sexual orientation. A study conducted in Sydney compared homosexual/bisexual male and female regular ecstasy users with their heterosexual counterparts to determine whether patterns of drug use or risk differed across these groups (Degenhardt, 2005). It was found that self-reported risk behaviours such as unprotected sex and needle sharing (among injectors) did not differ according to sexuality. However, homosexual/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.

Increased risk-taking behaviours related to ATS use were raised as an issue during consultations. Particular mention was made of sexual health and concerns raised over the transmission of sexually transmitted infections (STIs).

### Aggression and violence

Most research linking ATS drugs with aggressive and violent behaviour has focused on its association with methamphetamine. The impact of methamphetamine use on neurochemical brain systems is thought to underlie the relationship with aggression. A recent study by Sekine and colleagues (2006) found that chronic methamphetamine users had higher levels of aggression than non-drug using controls and decreased levels of serotonin in areas of the brain involved in the regulation of aggression. However, serotonin depletion is more often documented in relation to ecstasy use than methamphetamine and little evidence has been found for a relationship between ecstasy use and aggression. Methamphetamine is more often implicated in regulation of dopamine and in this regard, may relate to aggressive behaviour via the 'fight-or flight' response of the sympathetic nervous system (Haller, Makara & Kruk, 1998).

Several studies have found high levels of aggressive behaviour among regular methamphetamine users (Hall et al., 1996; Sommers & Baskin, 2006; Wright & Klee, 2001; Zweben et al., 2004). The 2006 IDRS (O'Brien et al., 2007) asked participants about drug-related aggression. Verbal aggression following the use of alcohol/other drugs was reported by 33% of the sample and physical aggression by 13%. For both of these behaviours, various formulations of methamphetamine were by far the most common drugs reported as being consumed prior to aggression. For those who had been verbally aggressive, 46% reported taking a form of methamphetamine and for those who had been physically aggressive, 49% reported taking a form of methamphetamine.

Police detainees charged with violent offences were not more likely to test positive to methamphetamine than those charged with other forms of offending (Smith, forthcoming). However, heavy or dependent ATS users were more likely to have a history of violent offending. The number of times ATS dependent users were charged with a violent offence in the past 12 months was higher than those detainees not dependent on ATS. Furthermore, it was found that violent detainees dependent on ATS had greater contact with the criminal justice system through arrest or imprisonment than other violent detainees. More specifically, of all violent offenders, aggravated robbery offenders were most likely to report ATS dependence, were more likely to indicate that all of their offending was drug related, and were most likely to have spent time in prison in the past 12 months.

A significant difficulty in disentangling the links between meth/amphetamine and violent crime is polydrug use. In attempting to disentangle polydrug use and violent crime, analysis of the drug using histories of incarcerated male offenders found that those who were regular users of both heroin and amphetamine had the highest likelihood of involvement in violent crime, followed by those who were regular amphetamine users, and then regular heroin users (Makkai & Payne, 2003, see Table 3.2). Those who were not regular users of either drug had much lower probabilities of involvement in violent crime and lower frequency of offending.

**Table 3.2: Violent offending histories for regular amphetamine and heroin users, adult male prisoners (%)**

	Regular amphetamine user only	Regular heroin user only	Regular amphetamine and heroin users	Non-regular user of any drug
Violent offence history				
Ever committed any violent offence	81	76	81	65
Ever regularly committed a violent offence	26	29	36	17
Ever regularly committed two or more violent offences	9	8	12	2
Frequency of violent offending (column per cent)				
More than one day per week	5	9	8	2
One day per week	5	4	5	2
About monthly	4	9	14	4
Less than once a month	34	29	20	35
None in the past six months	22	20	22	24
Never in my life	29	29	31	35
(Total)	(100)	(100)	(100)	(100)

Source: Australian Institute of Criminology, DUCO Male Survey, 2001

It has also been speculated that the relationship between violent behaviour and methamphetamine use is related to psychosis. Recent studies in Sydney found that methamphetamine users reported experiencing overt hostility during psychosis (McKetin, McLaren & Kelly, 2005), and in another study, half those who experienced psychotic symptoms in the past year reported feeling hostile or aggressive at the time, and one quarter exhibited overt hostile behaviour (McKetin et al., 2006a).

McKetin and colleagues (2006b) reviewed the existing literature and concluded that it is not clear whether violent behaviour among chronic methamphetamine users can be attributed directly to methamphetamine use or to co-occurring factors, such as concomitant alcohol use, psychiatric status and lifestyle factors. The authors found that research was limited by a failure to distinguish between economically motivated violent crime and assaults, and lack of controls for personality and lifestyle factors. However, the authors stated that while there is currently insufficient evidence to indicate a direct causal relationship between methamphetamine use and violence, the evidence for this relationship appears strongest in the context of methamphetamine-induced psychosis.

### 3.6 Effects on family and community

ATS use also has considerable implications and consequences for the families and friends of users, and the wider community. The social and behavioural effects outlined above (e.g., driving risks, spread of STIs, aggression and violent behaviour) significantly impact at both an individual and community level. Family relationships are affected both in regards to the impact on parents of an ATS user (see Chapter 4; 'Prevention and Harm Reduction') and on children exposed to parental ATS use. Children are affected by ATS use during pregnancy and by the impact of growing up in an environment where people are using drugs. Backyard manufacture of ATS is an issue that affects both children and community members through exposure to laboratories and associated chemicals. These factors are discussed below in relation to existing research.

The detrimental effect of ATS on relationships was highlighted throughout the consultation process. The impact of ATS use on peer relationships was identified as an area to target in prevention programs. It was suggested that a heavy ATS use can result in a 'loss of mateship'. The detrimental impact on relationships was also mentioned in relation to consumers' alienation from their family and friends. Within Indigenous communities, it was suggested that a great sense of shame is experienced over ATS use and there can be a loss of cultural identity and connection. Paradoxically, while many might use ATS in social settings, adverse impact on people's social and family relationships can be a significant factor in treatment seeking.

#### ATS use during pregnancy

The 2004 NDSHS found that women who were pregnant and/or breastfeeding in the previous 12 months were less likely to consume alcohol (47%) and any illicit drug (6%) than those not pregnant and/or breastfeeding (85% and 17% respectively) (Australian Institute of Health and Welfare, 2005a). Births in mothers with opioid, stimulant or cannabis diagnoses are linked to several negative birth outcomes (e.g., low birth weight). A recent study of over

400,000 linked birth records from 1998 to 2002 (Burns et al., 2006) found 1,974 mothers had an opioid diagnosis, 552 a stimulant diagnosis and 2,172 a cannabis diagnosis (Table 3.3). Births in mothers with these drug-related diagnoses were more likely in women who were younger (particularly in the cannabis group), who were not married, who were Australian-born, and who were Indigenous. Mothers with a drug-related diagnosis were also more likely to be without private health insurance.

**Table 3.3: Maternal demographic characteristics of pregnancies to mothers with and without a drug-related diagnosis code, 1998–2002 (%)**

	Worse		Better		Same as normal	
	n	%	n	%	n	%
Alcohol only	72	62	12	10	32	28
Cannabis	37	44	15	18	32	38
Cocaine	3	50	0	0	3	50
Heroin	14	61	1	4	8	35
Amphetamine/methamphetamine	39	49	20	25	20	25
Benzodiazepines	20	83	1	4	3	13
Alcohol and any of these drugs	51	65	11	14	16	21

Source: AIC, DUMA collection 2006

Other studies have found that fetal exposure to methamphetamine can lead to multiple prenatal complications, such as intraventricular hemorrhage, fetal growth restriction, increased risk of preterm labour, placental abruption, decreased birth weight, cardiac defects, cleft palate, and behavioural effects in neonates (National Institute on Drug Abuse, 1998; Plessinger, 1998; Smith et al., 2003). Methamphetamine exposure throughout gestation has been associated with decreased growth in infants exposed only for the first two trimesters. They were found to be significantly smaller for gestational age compared with the unexposed group (Smith et al., 2003). Neurotoxic effects include neurochemical alterations in areas of the brain associated with learning, leading to cognitive impairment, behavioural deficits, increased motor activity, and enhanced conditioned avoidance responses.

However, as reviewed in Dean and McGuire (2004), a number of other studies have failed to demonstrate a relationship between malformations and amphetamine exposure. Taking into consideration the entire body of research reviewed, the authors concluded that the use of amphetamine in regular low doses poses little teratogenic risk. However, further research is required to address the possibility of cardiac malformations and whether dependent or binge patterns of amphetamine use may confer a greater risk to the foetus. With regards MDMA use during pregnancy, Dean and McGuire (2004) found insufficient evidence to make firm conclusions about the potential teratogenicity of MDMA.

## Parental ATS use

In addition to the potential adverse effects of maternal drug use during pregnancy (outlined above in respect to ATS), research has found that rates of behavioural and emotional problems are more prevalent among children of illicit drug users, particularly oppositional-defiant and non-compliant behaviours (e.g., Smith, 1993; Willens et al., 1995). In a study conducted by Patton (2003), reports from service providers indicated a range of problematic and dysfunctional behaviours in children raised in families where illicit drugs were used:

fear of abandonment; separation anxiety; fear of losing their carer; fear of being left alone; self-blame for their parent's departure; collecting food and hoarding it; overeating; intense fear of sirens and the police; inappropriate sexualised behaviour; sleeping difficulties; aggression (p.8).

The impact of parental use has been illustrated by research conducted by the Department for Community Development (DCD) in WA (Leek, Seneque & Ward, 2004) found that in cases involving children:

- Drug and alcohol use contributed to 57% of cases studied;
- Drug and alcohol use was the second most common contributing factor for an application to DCD following neglect;
- Where a single main reason could be identified, drug and alcohol use was the main reason in 23% of cases;
- 44% of respondents to care and protection applications were drug and alcohol users; and
- Of those known to be AOD users, 42% were using psychostimulants and 54% were polydrug users.

The 'Nobody's Clients Project' conducted by Odyssey House in Victoria reported on the experiences of 48 primary school aged children whose parents had accessed treatment for drug dependence (Gruenert et al., 2004). It was reported that:

- By age 7, on average, children had moved house over five times and attended two schools;
- The majority of primary caregivers of the children were unemployed and relied on government payments;
- Over 50% of parents reported that their children had been negatively affected by their drug use and 70% that their child's exposure to active drug use was 'distressing';
- Child protection services were actively involved with 41% of the cases and had past involvement with 67% of the cases; and
- 24% of the children obtained scores in the clinically abnormal range on the Strengths and Difficulties Questionnaire (SDQ).

The recently released paper by the Australian National Council on Drugs (ANCD) (2006), 'Drug Use in the Family: Impacts and Implications for Children', highlighted the lack of direct research evidence on children affected by parental drug use. Consequently, impacts can only be inferred from current data sources, as was presented in the report. Data from the 2004 NDSHS were re-analysed according to the sub-sample of adults who lived in the same household as dependent children under the age of 12 years. Analyses for risk of child exposure to alcohol and other drug use in these households were conducted by primary drug of use. It was concluded that for every 1000 adults in Australia, 49 dependent children under the age of 12 are living in a household with an adult who had used methamphetamine in the last year, and 8.4 children are living in households with an adult using methamphetamine at least monthly (Australian National Council on Drugs, 2006).

The ANCD report also analysed the 'Patterns of Amphetamine Use' database obtained by the Crime and Misconduct Commission. This sample consisted of 690 individuals of which 207 individuals (56% women) reported having children. In comparison to amphetamine users without children, those with children were significantly more likely to use base and crystal methamphetamine, as well as benzodiazepines (Australian National Council on Drugs, 2006). Of note, over a six-month period, those with children reported using crystal methamphetamine on twice as many days as those without children (55.1 versus 27.6 days). Of further concern was the prevalence of family violence in these households. It was reported that a higher proportion of amphetamine users with children had experienced physical violence from partners and nearly three times as many experienced regular partner violence compared to amphetamine users without children.

The ANCD report indicated that perhaps the most significant outcome for children raised by parents using illicit drugs was the increased prevalence of child maltreatment, both child abuse and neglect. However, it acknowledged that poor child outcomes cannot be directly attributed to parental illicit drug use given the variety of other adverse conditions commonly encountered, such as socioeconomic disadvantage (e.g., unemployment, poverty, transient lifestyle), poor mental health (e.g., co-morbid psychopathology) and social isolation (e.g., absence of social supports).

## Manufacture

In addition to parental use of methamphetamine limiting the ability to adequately care for and supervise children, manufacture of ATS in or near the home creates a high-risk, unhealthy and unsafe environment (Gutchewsky, 2003). Manufacture of ATS can involve a relatively simple chemical process that uses highly flammable, very toxic and corrosive chemicals (Caldicott et al., 2005). Several groups of people are therefore placed at risk in relation to manufacturing, including other adults, children, police, forensic scientists and emergency workers. Special consideration must also be given to environmental decontamination of ATS clandestine laboratory sites and to the protection of exposed populations during this process. Disposal of chemical waste products from ATS production, such as phosphorous-based solvents, can create pollution, and human and environmental risk (Irvine & Chin, 1991).

The Minnesota Department of Health (2002) outlined the following common chemicals found in methamphetamine laboratories and their physical effects:

- Solvents (e.g., acetone, ether/starter fluid, methanol, white gas, xylene), which have been linked to irritation to skin, eyes, nose and throat; headaches; dizziness; depression; nausea; vomiting; visual disturbance and cancer;
- Corrosives/irritants (e.g., anhydrous ammonia, hydriodic acid, hydrochloric acid, phosphine, sodium hydroxide, sulphuric acid), which have been linked to coughing; eye, skin and respiratory irritation; burns and inflammation; gastrointestinal disturbances; thirst; chest tightness; muscle pain; dizziness; and convulsions; and
- Metals/salts (e.g., iodine, lithium metal, red phosphorous, yellow phosphorous, sodium metal), which have been linked with eye, skin, nose and respiratory irritation; chest tightness; headaches; stomach pain; birth defects; and jaundice/kidney damage.

ATS are often manufactured in private residences, or 'backyard clandestine laboratories', and this can place children at high risk. In the United States, the National Drug Intelligence Centre (2002) noted that 2028 children were present at seized methamphetamine laboratory sites and that 35% of those tested positive for toxic levels of chemicals. Health effects for children exposed to these chemicals include gastrointestinal problems, chemical burns, brain damage, headaches, skin and eye irritations (Horton, Berkowitz & Kaye, 2003), tachycardia, agitation, irritability and vomiting (Kolecki, 1998).

Such issues are receiving increasing attention in Australia. For example, the *Drug Misuse and Trafficking Amendment Act* (NSW) recently established new penalties for the endangerment of children by exposure to illicit drug manufacture.

### 3.7 Summary

The primary action of ATS in the brain is to elevate levels of dopamine, serotonin and noradrenaline. Methamphetamine has a stronger effect on dopamine levels while ecstasy is more strongly associated with serotonin levels. The sought after effects of ATS include a sense of wellbeing, euphoria, increased alertness and concentration, diminished appetite, enhanced confidence, sharpened sensory awareness. The short-term adverse effects include restlessness, irritation, anxiety, teeth grinding, insomnia, sweating and increased heart rate.

Prolonged use of ATS can also have several long-term effects in diverse areas of functioning. The primary adverse cognitive effects for all types of ATS appear to be deficits in working memory, attention and executive function. Several psychological problems have been identified in association with ATS use, most notably, depression, anxiety and psychosis. Well documented is the link between use of crystal methamphetamine and psychotic symptoms, which can be associated with violent behaviour. Dependence is another adverse outcome of ATS use, associated more with the use of methamphetamine than ecstasy. Dependence is also more strongly associated with injecting and smoking methamphetamine, than with other routes of administration such as snorting and swallowing. Other effects are specific to route of administration; for example, increased

risk of blood borne virus transmission with certain injecting practices. In addition, there are several adverse physical outcomes of ATS use such as hypertension, irregular body temperature, cardiac arrhythmia, metabolic disturbances, poor dental hygiene and lethargy. There is some research on neurotoxicity and overdose associated with ATS use, with deaths more often resulting from use of methamphetamine than ecstasy.

ATS use can also have adverse behavioural and social effects. Many ATS users are polydrug users and use of ATS in combination with other drugs, including alcohol, can increase related harms. Certain contexts of use increase the risk of harm. For example, ATS use can impair driving ability and workplace safety. ATS use has been associated with risky sexual practices, such as a failure to use protection thereby increasing the risk of sexually transmitted infections. There is growing research on the use of ATS in homosexual populations, particularly among gay males. Methamphetamine has also been associated with aggression and violence, and linked to some criminal activity.

In addition to the effects of ATS use on the individual, there may be a wider impact on family, friends and the broad community. ATS use can have a detrimental effect on relationships, with the user becoming increasingly alienated from social networks. ATS use during pregnancy can negatively affect the developing foetus as can use while breastfeeding. Parental ATS use can result in adverse outcomes for children. Finally, exposure to methamphetamine manufacture represents a potential harm for children and the wider community, including those responsible for cleaning up production sites.

The need for further research into the effects of ATS use was raised during consultations. The most neglected areas of research were seen as epidemiological information about patterns of drug use and related problems; the long-term effects of ATS use; neuropsychological deficits and their impact on the effectiveness of treatment; effects of ATS use during pregnancy; memory deficits associated with use; and strategies to enhance engagement with treatment services.

## Chapter 4: Prevention and Harm Reduction

### 4.1 What is prevention?

Various strategies have been used to prevent drug problems, such as law enforcement approaches to prevent and disrupt production and supply, community based information and awareness raising programs, and strategies that aim to prevent and/or reduce problems in those who are currently engaged in drug use. In their extensive review of the literature on prevention, Loxley and colleagues (2004) defined prevention as:

measures that prevent or delay the onset of drug use as well as measures that protect against risk and reduce harm associated with drug supply and use (p.xiii).

Prevention approaches are typically generic to all drug types and may be adapted to address a specific drug class, such as amphetamine-type stimulants (ATS). The most common classification for these strategies is as follows:

1. Primary prevention – prevent and reduce initiation of drug use (for example, education programs warning of the risks of drug use and supply control strategies);
2. Secondary prevention – reduce the up-take of high-risk drug use, such as injecting and dependence, to prevent problems in those already engaged in drug use (for example, targeting interventions to current users to ensure that they avoid injecting); and
3. Tertiary prevention - prevent behaviours that lead to significant social and/or individual harms among dependent users (for example, reducing the risk of HIV or Hepatitis; reducing the risk of overdose).

An alternative conceptualisation of prevention was suggested in 1994 by the United States Institute of Medicine, and based on the level of risk of disorder in various target groups, as follows:

1. Universal prevention – target whole populations at average risk;
2. Selective prevention – target specific groups at increased average risk;
3. Indicated prevention – target individuals with early emerging problems.

According to both these models and, as indicated in the definition of prevention provided above, the nature of and methods used in any prevention strategy will depend on the specific aims and intended audience or targeted behaviour/contexts. Strategies that aim to inform the broad community about drug use and drug risks are likely to be distinguished from strategies that are aimed at preventing use among school aged children, and strategies that aim to reduce the problems arising from injecting behaviour.

The range of different ATS prevention strategies therefore includes broad strategies (e.g., targeting the whole community, through mass media campaigns; focusing on all school-aged children, through school drug education; preventing use and problems among

employees, through workplace programs); programs aimed at those who are identified as at risk of engaging in drug use and experiencing related problems (e.g., targeting vulnerable families and/or communities; targeting people affected by mental health problems); and programs that target current users (e.g., peer education to reduce the risk of HIV or drug overdose). The range of potential prevention strategies was summarised by the Australian National Council on Drugs (ANCD) (2007):

The means of implementing prevention strategies varies from strengthening societal infrastructure (e.g., providing opportunities for education, employment and recreation), educating young people about the harmful effects of drugs (e.g., school-based prevention programs), to early interventions and peer-based outreach programs aimed at reducing problematic patterns of drug use (e.g., injecting drug use and HIV risk behaviour). Media campaigns have also been used successfully to reduce a range of unhealthy behaviours, including drug use (p.6).

The nature and impact of various drug prevention strategies, including harm reduction measures, are reviewed elsewhere and will not be considered in detail here (for example, see review by Loxley et al., 2004). However, in the sections that follow, a brief commentary on some common illicit drug prevention and harm reduction strategies is provided, before discussing their application to ATS. For the present purposes, measures that prevent or delay onset of drug use will be referred to as prevention strategies, while measures targeting related harms for those already using drugs will be referred to secondary prevention and/or as harm reduction strategies. Measures that address or alleviate the effects of use (e.g., dependence, psychological problems, overdose, withdrawal) will be considered in the separate section on 'treatment'.

## 4.2 Preventing drug use

In their review of the literature, Loxley and colleagues (2004) reviewed several key strategies targeting prevention of the uptake of drug use. These pertained to particular developmental stages such as pregnancy (e.g., health assessments, home visiting); infancy and early childhood (e.g., parent education, school preparation programs); primary school (e.g., school-based drug education; school organisation and behaviour management); and adolescence (peer intervention and education; youth recreation programs, mentorship, community-based drug education). Other strategies are more broad-based and may target potential drug use as one component within a broader set of goals (e.g., crime prevention, mental health promotion); be workplace interventions (e.g., pre-employment screening; drug testing; workplace health promotion); community-based interventions (e.g., health promotion, social marketing); or target at-risk sub-populations (e.g., those with co-existing mental health problems, programs for some Indigenous communities). Following is an overview of those prevention campaigns most commonly adopted and their application to ATS. Harm reduction strategies are presented in the same format in a subsequent section, followed by discussion of the particular challenges of targeting ATS use.

Specific issues raised during the consultations are outlined in the relevant section. Some general comments related to the content of prevention and harm reduction campaigns. It was suggested that campaigns need to refer to ATS in their entirety. That is, the focus

should cover the full range of different ATS and not just focus on one particular drug (e.g., methamphetamine). It was considered important to emphasise that ecstasy is an ATS and its apparent separation from the harms associated with more potent forms, such as methamphetamine, should be addressed. However, other participants raised some concerns about the apparent segmenting of particular drugs and proposed that there was a need to have programs that targeted drug use in general, not just ATS.

A large proportion of participants in the forums raised concerns about the apparent glamorisation and/or portrayal of ATS as relatively 'soft' or benign drugs. It was argued that there needed to be a concerted response to the perception among some people that ATS were fun and socially acceptable drugs with no major risks or harms. A number of participants observed that many ATS users underestimated the range and severity of risks associated with use. This issue was also addressed in some of the written submissions. For example, Drug Free Australia (DFA) raised concern at the apparent acceptability of ATS in some groups and observed that:

In terms of amphetamine type stimulants Australia, which has the highest illicit drug use in the developed world, would do well to emulate the policies of the country [Sweden] with lowest use.

## Mass Media Campaigns

Mass media campaigns are universal prevention strategies designed to raise awareness and provide information. However, the aims of mass media campaigns are diverse. For example, they may variously aim to ensure that the community is informed about related activities (e.g., random breath testing), is informed about particular risks of drug use or where to get help, or may have a broader aim of preventing or reducing drug use. While such campaigns have the potential to effectively prevent licit drug use, one common criticism has been that they are rarely subjected to adequate evaluation (Palmgreen & Donohew, 2003) and in particular, evidence is limited regarding their impact with illicit drugs (e.g., see Loxley et al., 2004). They are most likely to have impact when they are part of a multifaceted approach (e.g., raising awareness of the impact of drugs on driving, raising awareness of law enforcement approaches to deter and detect drug impaired driving and road-side drug testing).

In order to be effective, mass media campaigns require substantial exposure (in other words, short term initiatives are likely to be ineffective) and have a basis in advanced marketing strategies that effectively target, and communicate with, the desired audience. That is, for example, by focusing on issues that are subjectively relevant for the target audience. The evidence indicates that the effectiveness of a mass media campaign is contingent upon targeting a well-defined audience, understanding the dominant attitudes and beliefs of this audience, in this context designing credible messages, and frequent presentation of these messages to the audience (Bertram et al., 2003). Thus, the aim of the prevention message needs to be matched with the beliefs, attitudes and characteristics of the targeted segment of the community such that it is communicated in a relevant manner. Therefore, it is critical to pre-test prevention messages regarding their impact and appropriateness to the target audience (National Institute on Drug Abuse, 2002).

It is important to recognise that, as with other strategies, mass media campaigns have the potential for unintended consequences, for example by creating interest in a drug where none previously existed, paradoxically glamorising a drug, or introducing naïve members of the community to information about how to use a particular drug. Some campaigns risk stigmatizing and/or marginalising users, reducing the likelihood that they will seek or be able to access treatment. This underlines the critical importance of trialing and evaluating campaigns to ensure that they avoid conveying messages that have the unintended effect of increasing the acceptability or appeal of a drug, or stigmatizing users in a way that hinders the successful implementation of a range of prevention, harm reduction and treatment interventions.

During the consultations, a number of participants suggested that there was a need for mass media campaigns that highlight the risks associated with methamphetamine use, while other participants cautioned that simple ‘scare campaigns’ are rarely effective and, like all interventions, should be evidence-based and subject to proper evaluation. For example, two separate participants commented that:

Those like the Grim Reaper create fear and alienation; they do not change behaviour.

For those who feel socially disconnected, scare tactics may have the reverse effect.

An example of a broad-based initiative is The National Drugs Campaign, which includes, but is not exclusively focused on, ATS. This social marketing drug prevention campaign was initiated by the Australian Government Department of Health & Ageing and launched in May 2001. It initially targeted the broader community, with a particular focus on parents. The campaign specifically focuses on “speed, ecstasy and cannabis”, and includes television commercials, print advertisements, booklets, posters and wallet cards. From April 2005, the emphasis shifted towards targeting youth, with the development of specific advertising strategies, information and resources on crystal methamphetamine targeted at the 18 to 25 year old market, to be made available through settings such as nightclubs, festivals and party venues.

A campaign that specifically targeted ATS was ‘Putting the Brakes on Speed’. This community awareness program commenced in 2006 and involved the distribution of a large number of colourful and informative posters and related materials. The aim was to increase awareness in the community and specifically targeted the chemical industry, hotel/motel associations, real estate industry, scientific suppliers, and pharmacies of the existence and indicators of clandestine laboratories. The project encouraged members of the public to report all suspicious behaviour or purchases to the State Drug Investigation Unit Chemical Diversion Desk.

### School-based prevention activities

Many school-based prevention activities are examples of primary prevention that are designed to prevent the initiation of drug use, and to a lesser extent, prevent problems that may arise from drug use. In considering how to plan activities to address a specific drug type, it is noted that school-based drug prevention approaches usually address the broad range of drug use – that is, they aim to prevent the uptake of drugs rather than any

specific drug (Spath et al., 2006). The evidence also indicates that effective school-based prevention programs do not just rely on passive information exchange or a singular focus on skills related to drug use (for example, drug refusal skills), but also include a focus on more generic personal self-management and social skills (Botvin & Griffin, 2003; Midford & Munro, 2006).

In Australia, the *Principles for school drug education* (Department of Education, Science and Training) were developed to encourage the development of evidence-based school drug education. The principles are as follows (see Meyer & Cahill, 2004):

1. Base drug education on sound theory and current research and use evaluation to inform decisions;
2. Embed drug education within a comprehensive whole school approach to promoting health and wellbeing;
3. Establish drug education outcomes that are appropriate to the school context and contribute to the overall goal of minimising drug-related harm;
4. Promote a safe, supportive and inclusive school environment as part of seeking to prevent or reduce drug-related harm;
5. Promote collaborative relationships between students, staff, families and the broader community in the planning and implementation of school drug education;
6. Provide culturally appropriate, targeted and responsive drug education that addresses local needs, values and priorities;
7. Acknowledge that a range of risk and protective factors impact on health and education outcomes, and influence choices about drug use;
8. Use consistent police and practice to inform and manage responses to drug-related incidents and risks;
9. Locate programs within a curriculum framework, thus providing timely, developmentally appropriate and ongoing drug education;
10. Ensure that teachers are resourced and supported in their central role in delivering drug education programs;
11. Use student-centred, interactive strategies to develop students' knowledge, skills, attitudes and values; and
12. Provide accurate information and meaningful learning activities that dispel myths about drug use and focus on real life contexts and challenges.

These principles informed development of the Resilience Education and Drug Information (REDI) program ([www.redi.gov.au](http://www.redi.gov.au)). This is a set of resources designed to support the implementation of a resilience approach to school drug education in Australia, conceptualised as one component of promoting the health and wellbeing of students and school communities. Materials are available for use in the classroom (both primary

and secondary), for professional development, for parents, and in preparation for tertiary education. These are the first school drug education resources to focus on preventing and reducing harm from drug use by building resilience and connectedness in students.

To date, there is a stronger evidence base for the effectiveness of school-based campaigns in targeting licit drugs, such as alcohol and tobacco, compared to illicit drugs, including ATS (Loxley et al., 2004). A major criticism of such approaches is their limited capacity to address the complex variety of factors associated with the uptake and continuation of drug use (Stubbs et al., 2004). An additional concern is that those young people most in need of such information and assistance are those who may not currently be attending school (e.g., engaged in truancy, been suspended or expelled). Consequently, the 'Reconnecting Youth Program' targets youth at risk of dropping out of school and those with multiple problems (Eggert et al., 1994). This program incorporates personal growth classes, social activities and school bonding to teach resiliency skills that moderate the effect of risk factors for drug abuse and has shown evidence of improving school performance as well as enhancing several psychological and emotional attributes of participants. Strategies targeting at-risk youth outside of educational institutions include peer education and those outlined below in the sub-section on 'young people'.

The issue of the effectiveness of school-based drug education campaigns generated contention and debate at some consultation forums. While some participants held that these strategies were important and effective, others argued that school-based programs can be problematic. In particular, concern was raised about the uptake of evidence based school drug education, as decisions to implement such programs were locally determined (e.g., by school principals) leaving a significant proportion of schools without effective and evidence-based programs. Two comments illustrate some of the issues:

People are not always keen to take on the responsibility for the policy context of these campaigns or to deliver them at the school level.

Although the curriculum includes a Health component dealing with drugs, its delivery is dependent on schools and the inclination and capacity of staff.

Some participants recommended that there was a need for specialist educators and perhaps also ex-drug consumers to address school students as part of the drug education programs. Others suggested that rather than focus on drugs per se, a broader approach was needed to address psychosocial and cultural factors that improved general health and well being, such as social emotional wellbeing, self esteem and life skill programs. Others argued that any program adopted should be evidence-based:

Best practice for school drug education is to focus on social skills such as resilience, decision making rather than respond to specific drug phases.

Despite some debate about the best approaches to school drug education, there was consensus around the need to develop the capacity of teachers to implement school based drug prevention and harm reduction programs. There was also general agreement that school drug education programs should be ongoing, as opposed to short term, for example being repeated and reinforced in each school year. It was suggested that drug education programs should commence as early as Year 6 or 7 of primary school, and

be applied regularly and systematically thereafter. Another common view was that drug education should be continued in post-secondary and tertiary education institutions given the high prevalence of ATS use among the 20 to 29 year age group (see 2004 National Drug Strategy Household Survey; NDSHS). As indicated, there was general agreement that school-based drug education should be informed by the evidence.

## Peer education

Peer-based prevention approaches have been variously used to prevent the uptake of drugs and to reduce problems for those already using drugs. Such strategies have the advantage of being able to access groups who might not otherwise attend general health or drug specialist services. Access may instead be facilitated through outreach or centre-based programs delivered by peer educators and professionals (Substance Abuse and Mental Health Services Administration, 2003). As noted above, peer education may be particularly helpful in targeting young people, during and after their formal education, and during transition periods (e.g., transition to post-secondary education or transition to work) when they may be at increased risk of being exposed to drugs and or make a transition to problematic drug use. Information and advice delivered in this manner may be more likely to have impact. It has been observed that much of the knowledge about drug use, both accurate and inaccurate, is sourced from peers:

... information from a personal source rather than a booklet, or other printed material or some other 'official' source is more likely to be understood and assimilated. For these reasons, most knowledge about using drugs is almost exclusively derived from other drug users. (Moore, 1992, p.87)

Peer education strategies usually involve the use of peers who are selected on the basis that they are credible and influential. Klee and Reid (1995) cautioned that, in the case of primary prevention (as opposed say to harm reduction), peers are not best selected from people who are already using ATS – they may have strong values supporting particular choices about using illicit drugs. Thus, primary prevention peer education may best be served by employing non-using peers. Peer educators receive training to help them to provide information and advice to current users to reduce potential drug related problems to themselves and others. While the evidence in regard to the effectiveness of peer education is variable, it has been concluded that initiatives that are well designed and sufficiently supported can be effective in reducing drug use and related problems (McDonald, 2003). These authors noted that, in general, peer education can have a positive influence on knowledge and, to a lesser extent, attitudes, skills and behaviour. There is also evidence to suggest that, for young people, peer education may be more effective than adult-led education. This could be because peer initiatives are more interactive and often occur outside formal settings (McDonald, 2003).

Beyond primary prevention, the Australian Injecting and Illicit Drug Users League (AIVL) developed a framework for peer education for drug-user organisations (AIVL, 2006). How 'peer education' is defined will have obvious implications for how it is implemented. In relation to this point, AIVL (2006) states:

Peer education exists independently and predates the existence of funded, externally supported structures or projects...Damon Grogan describes peer education as a “naturally occurring, organic process that occurs within such groups independently of governments or organised structures, but which may be resources and utilised to more effectively achieve positive outcomes (p.4).

Guided by this perspective, AIVL (2006) propose the following principles for formal peer education by drug-user organisations: equality, self-determination and ownership, pragmatic learning, developing community, harm reduction, privacy and confidentiality. In their written submission, AIVL stated:

A strong argument for the use of peer education lies in...the importance of identity and identification within marginalised populations, and the credibility that is generally accorded to both the messenger and the message...Peer education provides a way to access hidden populations which is crucial for ATS given the diversity of communities using these drugs. Making use of new media technologies, such as the internet and mobile communication, and involving ex-/consumers in the planning, delivery and evaluation of prevention programs were also recommended. One individual submission suggested that campaigns needed to acknowledge the positive experiences expressed by ATS users if they were to be perceived as accurate and balanced in their approach. However, it was also recommended that caution be exercised not to glorify or enhance acceptability of drug use.

While there is very limited information that specifically addresses the impact of peer education on ATS use, there is no reason to believe that outcomes with other illicit drugs would not be replicated with ATS users (Allsop et al., 1999). One example of a peer education initiative is the RaveSafe program delivered by VIVAIDS with funding from the Victorian Department of Human Services. This program aims to increase the capacity of individuals and organisations involved in the rave and dance party scene to reduce potential harms of drug use. RaveSafe trains key peer educators recruited from the dance scene to host ‘chill out’ spaces in 12-15 dance events annually and also ensure that minimum safety standards are maintained at such events. ‘Safer party packs’ are also distributed that include a condom, lubricant and information on STIs. Positive feedback from those using RaveSafe initiatives were obtained from the RaveSafe Survey (VIVAIDS, 2005).

Similar projects are conducted in other states and territories. ‘Keep It Simple’ (KIS) is peer education project conducted in the Sydney dance scene. It involves peer educators attending nightclubs, festivals and events and actively engaging attendees with drug information and related issues, including mental and sexual health information, and referrals to available services. External evaluation of the project suggested that attendees viewed the peer educators as approachable and credible in delivering harm reduction messages. ‘Ravesafe Initiative’, ‘Ravesafe Peer Helper Program’ and ‘Amphetamine Peer Outreach Education Project’ are all peer-based strategies operating in Queensland that provide information about drugs and harm reduction practices to young people.

## Strategies targeting vulnerable groups and/or high risk behaviours

It has been observed that some individuals are at higher risk for drug problems. For example, people who live in dysfunctional families, where one or both parents use illicit drugs or are hazardous drinkers, who are disconnected from family and social networks and/or who experience mental health problems are more likely to use and be affected by a range of drug problems (e.g., see Loxley et al., 2004). Strategies that aim to reduce social and other inequities and strategies that address factors that increase the risk of drug use (e.g., effective management of mental health problems; effective parent education and support initiatives) have been found to reduce use and problems related to illicit drug use (e.g., Loxley et al., 2004).

Given the diversity of ATS users, the goal of targeting particular groups is particularly relevant to ATS use. Identified groups need to be targeted both in preventing ATS use, and in reducing harms associated with ATS use following initiation of use. In this section, issues related to some of the potential target groups for preventing ATS use are outlined. This includes young people, at-risk occupational groups, Aboriginal and Torres Strait Islander people, and Culturally and Linguistically Diverse populations. In addition, families of users and the general community also represent targets for information provision and assistance. Other target groups, such as gay, lesbian, bisexual and transgender populations, injecting drug users, and ecstasy users have to date been targeted in relation to reducing harms associated with ATS use, and are therefore outlined in a subsequent section. However, given that these groups have been identified as users of ATS, targeting campaigns to prevent uptake of ATS among these groups is an area in need of development.

### Young people

In addition to the potential harms and risks associated with ATS use that apply to the general population, some specific issues pertain to use by young people. Of note are the potential effects of ATS use on brain maturation and development, which could result in various neurological and psychiatric consequences (Rawson et al., 2007). While no published brain imaging studies have reported on methamphetamine use by young persons, animal studies suggest that methamphetamine exposure results in different alterations in central nervous system serotonin and dopamine alterations in adolescent animals than in adults (Dewey et al., 2006).

An example of a broad-based prevention campaign targeting youth is The Drug Offensive Amphetamines Campaign, 'speed catches up with you'. This campaign used both television and radio commercials, and targeted non-users and occasional users between the ages of 15 and 25 years. It aimed to deter potential users from trying amphetamine as well as alerting occasional users to the potential harms and risks of becoming more regular users. An evaluation found that while the campaign was effective in raising awareness among the target groups, it had minimal impact on drug use behaviour (Hando & Hall, 1997).

A more recent example is the Drugaware Amphetamine Education Program currently being conducted by Drug Aware (a program run by the Western Australian State Government Drug and Alcohol Office) in partnership with the WA Network for Alcohol and other Drug Agencies (WANADA). The target group for the campaign is 12 to 29-year-olds who are at risk of ATS

use, use ATS infrequently, and use ATS regularly. Youth communication mediums have been used including street press, community youth radio stations, convenience advertising, community-based education initiatives and other services (such as treatment services and needle and syringe programs) to provide information and assistance relating to ATS. As this is a relatively new initiative, its impact has not yet been evaluated. Operating in conjunction with Drug Aware in WA is the Night Venues and Entertainment Events Program (NVEEP), which includes a drug user education program, staff risk management training, and policy development, implementation and enforcement to reduce risk factors within night venues.

While some strategies targeting young people are school-based (outlined previously), others may target a particular drug (such as ecstasy) or context of use (such as nightclubs). However, it has been noted that both prevention and harm reduction strategies need to better target high-risk youth outside of these settings, such as homeless youth, those in juvenile justice environments and so on. Streetwize Communications developed a psychostimulant-specific comic, entitled 'On the Edge', targeted at these groups through distribution at venues such as youth centres and refuges. One key aspect to developing the resource was conducting focus groups to determine the information needs of young psychostimulant users to ensure the publication was relevant and appropriate. The information provided relates to issues of side-effects of use, harm reduction strategies, and treatment options, with preliminary evaluation showing recall of content four months after reading the material and sharing the resources with friends ([www.streetwize.com.au/publications](http://www.streetwize.com.au/publications)).

Peer-based strategies also have a potential role in harm reduction, as well as being used to prevent ATS uptake. For example, such strategies can be used to prevent drug-related harms such as sexual risk behaviours, transitions to injecting drug use, transmission of blood-borne viruses and preventing and responding effectively to drug overdose. Peer education and support have been shown to be effective, both overseas and in Australia, as risk reduction strategies to prevent infection with HIV in injecting drug user communities (e.g., Dowsett et al., 1999). Further, it has been asserted that peer education can be effective in increasing knowledge about hepatitis C, preventing further transmission of hepatitis C and encouraging behaviour change (e.g., Sansom 2001).

During consultations, there was widespread recognition of the need to target campaigns to certain audiences. With regards to young people, campaigns needed to be variously targeted, such as:

- segmented into programs for specific age groups, for example, primary school, 14 to 18 years old and 18 to 21 years old;
- those who are frequently absent from school;
- those who leave school after Year 10 and are in the transition from school to post secondary/tertiary education and/or work;
- 'at risk' children, as identified from the evidence base regarding social determinants of use; and
- young offenders in detention centres.

Examples of particular periods that might be appropriate to target young people were offered, including School Leavers week and 'O' week (Orientation week) at university. For example, one participant observed that there was:

a need to identify the risk factors of the problematic group of 17-21 year olds as they apply to depression, anxiety, early childhood experience; and to understand the nature of the drugs they are ingesting, and behaviours that lead to addiction.

Across almost all consultation forums, a number of participants suggested that 'new' media such as the Internet offer a means to communicate with many at risk groups, particularly young people. In relation to the Internet, one suggestion in particular was to link to sites accessed young people, such as 'YouTube' and 'MySpace'. Written feedback from one participant stated:

The vast majority use on recreational/occasional basis and so won't use treatment services – not necessary or relevant to them. Therefore need to focus on harm reduction via peer education and use of Internet and other new technologies.

It was also acknowledged that the Internet could be a source of inaccurate information and misinformation, and indeed, some law enforcement agencies were concerned about the role of the Internet in producing and distributing precursor chemicals and ATS. Peer education was raised as an underused approach by a number of participants. Peers can function as providers of information and education. Given their sense of responsibility for others, the skills of peers can be built up such that they can also be involved in strategies that focused on, as one participant put it:

... tak[ing] care of yourself and your mates.

A few written submissions made note of recommendations put forward in the recent Parliamentary Joint Committee Inquiry into amphetamines and other synthetic drugs (2007). In particular it was highlighted that:

The Committee recommends that public education and demand reduction campaigns for illicit drugs be factual, informative and appropriately targeted. The Committee also recommends that such campaigns seek input from young people, and take account of user experiences of amphetamines and other synthetic drugs (AOSD) (p.ix).

Primary prevention approaches were reflected in a number of written submissions. For example, Headspace, the National Youth Mental Health Foundation, argued that young people aged 12 to 25 years need to be identified as a priority target group. Similarly, a submission from Drug Arm argued for school drug education from Years 9 through 12. Such approaches might be enhanced by using emerging communication approaches and such approaches were currently being developed. For example, in their submission, the National Drug and Alcohol Research Centre (NDARC) noted that a school-based prevention utilising computer-based delivery is currently being developed in conjunction with St Vincent's Hospital that will include both a mental health and substance use strand.

Peer education approaches were also emphasised in some submissions. For example, the Northern Territory AIDS & Hepatitis Council Inc provided an outline of the Youth

Amphetamine Information Project (YAIP) that was established as a six month pilot project. The aim of the project was to develop up-to-date and accurate information on amphetamines and to implement a peer-based education training program targeting young people at risk of amphetamine use. In conducting the project, it was noted that: young people lacked knowledge about amphetamine and related harms; young people stated that they preferred to receive drug education from people who they consider to have drug use experience (namely, peer education); it was important to engage young people via accessible communication tools such as text messages, interactive web-based tools and email; and, it was important to be strategic in selecting venues for conducting workshops, to maximise participation.

The Red Cross Save a Mate Project (SAM) incorporates peer education with other prevention and harm reductions strategies. SAM is a drug education and first aid program, which aims to reduce incidents of harm and death associated with the use of alcohol and other drugs. The program is aimed specifically at at-risk youth, school children, nightclub staff, inmates in correctional facilities and those in drug rehabilitation programs. Volunteers aged 18 to 30 are selected and trained in harm minimisation and first aid strategies to deliver the three components of the program: alcohol and other drug specific First Aid training; pubs, clubs and venue initiative (includes training venue staff in responding to emergencies); and peer education teams (includes attendance at events to promote safer partying and harm reduction strategies to young people). SAM operates in New South Wales, Queensland, South Australia, ACT and Northern Territory, and will shortly commence in other states.

However, as already indicated, aside from some basic monitoring and evaluation strategies with a number of programs, the evidence base about ATS specific primary prevention strategies is limited. For example, to date, only one study has reported on prevention strategies specifically targeting methamphetamine use among adolescents. Spoth and colleagues (2006) concluded that effective prevention strategies should focus on brief universal interventions that incorporate: reducing early initiation into drug use (alcohol, tobacco, cannabis); skills-building opportunities; alternative activities; and family and/or peer support. At a recent meeting of the United Nations Office on Drugs and Crime, the following strategies for preventing the use of methamphetamine by young people were suggested: school-based activities (e.g., life skills training, teacher training, use of positive reinforcement techniques); careful targeting of high-risk families for pre-school interventions; using peer-based techniques to deliver information and skills; and empowering communities to reduce drug-related harm (United Nations Office on Drugs and Crime, 2006).

These various reports suggest that at-risk young people should be a particular target of prevention and harm reduction strategies. This in turn indicates that organisations that are involved in providing services to at-risk young people should be a component of any prevention or harm reduction strategy, and any program should include strategies to enhance their capacity (resources and skills) to recognise and intervene in escalating ATS use, including identification of those at high-risk of developing problematic patterns of use. Such activities and interventions need to be accessible and relevant to young people, and accurately describe the potential risks and harms involved with ATS use.

### At-risk workplaces

There is increasing evidence about the use of ATS in association with work, with associated risks of working under the influence of drugs and impact on absenteeism. The impact of ATS use in the workplace can result in:

- Overwhelming tiredness at the onset of the working week;
- Otherwise unaccountable irritability, agitation or mood swings;
- Difficulty concentrating and reduced performance;
- Mental health problems, such as paranoia, delusions, feeling despondent or depressed;
- Lack of concern about otherwise serious matters; and
- Health problems, such as palpitations, infected injection sites or lesions (National Centre for Education and Training on Addiction, 2006).

As outlined earlier (see 'use in the workplace', section 2.4), the use of ATS is more prolific in some industries than others. In particular, use in the transport industry, especially among long distance drivers, has been identified as one key area of concern in relation to the workplace. A report commissioned by the Motor Accidents Authority found evidence of widespread tolerance and lack of discouragement of drug use within transport companies (Quinlan, 2001). The use of stimulants by truck drivers in Australia was demonstrated in one study that detected stimulants in 23% of truck drivers compared to 4.1% of all drivers in road traffic crashes in three states (Drummer et al., 2003). In addition to concerns that ATS use may contribute to road injuries and fatalities, for drivers and innocent third parties, there are concerns about the health problems experienced by drivers as a result of prolonged use, including: high blood pressure; renal problems and kidney damage; heart and lung damage; stroke; liver damage; depression and other mental health issues (NSW Health, 2005).

Recently, a project was conducted by the NSW Injury Risk Management Research Centre in collaboration with the University of NSW into stimulant use by long distance truck drivers (Williamson et al., 2006). The first study aimed to identify factors that may predict drug use by reanalysing data from previous national surveys with long distance truck drivers, while the second study aimed to update and expand this information by conducting an in-depth survey of drivers. The strongest predictors of stimulant use by long distance truck drivers, according to self-reported reasons for use, were fatigue and productivity-based payment systems. The second study found that one in five truck drivers used stimulants at least sometimes and more than half had used these drugs at some point in their career. The most common stimulants used were illicit forms of amphetamine-type stimulants.

As a result of concern about ATS use in this population, some state-based strategies have been introduced. In NSW, the Roads and Traffic Authority has developed educational materials, including information booklets and posters, for drivers and operators highlighting the dangers of using drugs and the need for more appropriate fatigue management strategies.

Roadside drug testing is now being developed and implemented in a number of jurisdictions as a means to deter and detect drug impaired driving. While not restricted to the transport industry (indeed most governments have indicated an intention to target various high-risk groups and locations) this strategy will have direct relevance for the industry. In NSW, for example, a Drug Driving Working Party was convened to manage research and field trials in preparation for commencement of legislation to implement drug testing of drivers. This included the introduction of random roadside drug testing for the presence of certain illicit drugs, and compulsory drug testing of any driver involved in a fatal traffic accident. Similarly, random drug testing was introduced in Victoria in 2004, and while various trials and evaluations are still underway, roadside drug testing has been implemented or is currently being considered in most other states and territories (Lenne, 2007).

At a number of consultations, concern was expressed regarding the use of ATS in relation to work and it was suggested that the workplace should be a site for prevention and harm reduction strategies. Some participants suggested that there was a need to identify and disseminate models of managing ATS use in the workplace, some identifying current programs such as recently developed programs in the Department of Defense and guidelines for responding to drug problems developed by organisations such as Work Cover. For example, one participant observed that:

Some industries, such as the construction industry, do undertake screening and offer drug education programs and use employment contracts which make provision for drug treatment or dismissal although there is a concern that some ATS users know how to beat the screening process.

In their written submission, the National Indigenous Drug and Alcohol Committee (NIDAC) stated that:

The use of alcohol and other drugs has a significant impact on Australian workplaces in terms of accidents, lost productivity and absenteeism. While alcohol and other drug use may impact on the way people work, so may work related factors such as stress influence the way people use drugs. Occupational settings including transport, forestry, construction, industrial and hospitality industries have been noted as areas that have an association with the prevalence of ATS use.

Information gaps: Aboriginal and Torres Strait Islander People and Culturally and Linguistically Diverse Populations

Concern was raised during the consultation process that there is only minimal drug and ATS specific research within both Aboriginal and Torres Strait Islander people and communities and Culturally and Linguistically Diverse (CALD) communities. This relates not only to the use of ATS among these populations, but also how to target effective prevention campaigns to current users and those at-risk. Prevalence rates of use are variable and a lack of specific information makes it difficult to determine not only the need, but also the nature of any prevention strategy.

The consultation forum with Aboriginal alcohol and drug workers in Western Australia conducted by the Drug and Alcohol Office, and submitted to the ATS Strategy project team, resulted in the following recommendations in any approach to prevent and respond to ATS use among Indigenous people:

- Need to strengthen aspects of Aboriginal identity, including families, culture and community capacity;
- A holistic approach focusing on family and group interventions in appropriate settings should be used to address alcohol and other drug (AOD) use;
- Develop specific strategies to support Aboriginal grandparents and others who are carers of children due to parental use;
- Educate ATS users on harm reduction strategies, including prevention of blood borne virus transmission;
- Develop youth specific treatment programs provided in a range of settings;
- Improve coordination between AOD, mental health and acute health sectors in early detection and management of co-morbid mental health and AOD problems;
- Need for workforce training programs to develop drug related and knowledge/skills of Aboriginal culture;
- Improve shared case management between AOD, corrections and child safety agencies to enhance continuity of care and reduce barriers to accessing assistance;
- Expand drug diversion programs for Aboriginal people in coordination with local Aboriginal communities; and
- Incorporate aspects of Aboriginal culture and law into justice programs.

Discussions at consultations regarding Indigenous communities indicated that patterns of ATS use and risk of use varied from community to community and it would be important to develop specific strategies at a local level, including core materials, to ensure relevance of the style and content of the intervention. Suggestions about the needs of Indigenous people included:

- Identify and promote positive Indigenous role models for children, such as through a mentoring program;
- Enlist the support and guidance of elders in the community;
- Design specific, separate programs for men, women and children that involve activity-based, recreational activities and for some, “going bush”;
- Develop parenting/carers programs that take place within the home;
- Develop and implement programs that address socioeconomic factors related to unemployment and homelessness; and
- Employ visual media when aiming programs at Indigenous people.

A number of organisations have been involved in developing responses that have specific relevance for Indigenous people and communities. For example, AIVL, in conjunction with the Australian Federation of AIDS Organisations (AFAO), conducted a consultation with Indigenous injecting drug users in response to evidence of an increase in HIV diagnoses in Indigenous communities. The project aimed to explore their experiences in view of developing a national campaign to address the issue of intravenous drug use by Indigenous people (Coupland et al., 2005). The West Australian Substance Users Association (WASUA) and Derbarl Yerrigan developed the video, *Blood Relations: Injecting Drug Use and Hep C in Indigenous Communities* to provide critical health information about blood awareness to the injecting community. The Top End Division of General Practice (Darwin NT) and CONGRESS (Alice Springs NT) are currently trialing initiatives that take into account mental well being and substance misuse in Indigenous communities. Indigenous comics and computer-based animation programs have been effective methods of communicating with children in the NT, particularly those with poor literacy and numeracy skills. Aboriginal Drug and Alcohol Council (ADAC) have been funded by the Office for Aboriginal and Torres Strait Islander Health (OATSIH) to develop a comic, brochure and web presence on crystal methamphetamine.

### Parents and families

Consultations also raised the issue that parents/carers and families have limited knowledge about patterns of use and particular risks associated with use. In addition, many have remained unclear about the various treatment and other options for intervention. As potential sources of support for a drug user, families that are well-informed can be an effective site for intervention. In addition to being knowledgeable about the effects of drugs and associated risks, families may also need information on where to get help and how to access support services. It is therefore important that information is made available on a wider level so that those affected indirectly by ATS use have a better understanding of the issues and available resources.

Discussions during the consultations highlighted the need for support and help for families. This was stated not only in relation to assisting a family member who is a consumer, but also for family members to access support for themselves as someone affected by another's ATS use. Thus, families need information about what services are available, treatment options and opportunities for respite. Particular mention was made in regards to Indigenous families and the large number of grandparents caring for children due to parental use. Issues of poverty, threats of violence, and a sense of despair and desperation often permeate these circumstances and there is heightened need for support.

In all consultations it was noted that parents/carers/families needed enhanced access to information (warning signs, drug types etc), knowledge of available services for their children and, in some cases, how to get support themselves. This is a particular issue with some ATS because it was noted that some of the behavioural and mental health problems accompanying ATS use created particular problems for families. It was observed that parents represent a resource and support for their adolescent children and can be used in this capacity to prevent ATS use in the first instance and help children who have already begun to use. The need to strengthen and improve communication between parents and

young people was noted in the submission from Drug Free Australia, which referred to evidence supporting the conclusion that:

... teens who have a positive relationship with their parents are less likely to engage in risky behaviours,

and consequently recommended a need to:

Expand the development of resources to support parents in the education of their children about harmful drugs such as ATS.

Others were concerned about child protection issues, both in relation to exposure to parental ATS use and to clandestine laboratories. Where parents/carers are involved in ATS production, the risks associated with clandestine laboratories were a particular concern. It was agreed by many participants that there was a need to develop a range of child protection measures across the range of situations, including exposure to:

- Parental drug use during pregnancy;
- Parental drug use during the various developmental stages; and
- The risks of clandestine laboratories.

## Community

The 2004 NDSHS provides some indication of the public perception of ATS. Small proportions of the community identified meth/amphetamine (5.5%) and ecstasy (2.6%) as drugs perceived to be related to a 'drug problem' (Australian Institute of Health and Welfare, 2005a). This was matched by equally small proportions that reported that they perceived use of meth/amphetamine (3.1%) and ecstasy (4.2%) as 'acceptable'. With regards to law enforcement, very few supported any legalisation of personal use of meth/amphetamine, and the small degree of support for such changes had declined from previous surveys (6.8% in 2001 versus 4.7% in 2004). Proportions in favour of increasing penalties for meth/amphetamine sale and supply remained stable and high (83.7% in 2001 versus 85.7% in 2004). Respondents were also asked what actions should be taken for those found in possession of these drugs for personal use. The greatest proportions of respondents nominated 'referral to treatment/education program' for both meth/amphetamine (42.6%) and ecstasy (41.1%). A 'fine' was nominated by 19.7% for meth/amphetamine and by 24.6% for ecstasy, and 'prison sentence' by 20.8% for meth/amphetamine and 14.8% for ecstasy.

The consultations indicated that there was general agreement that there was a need to educate the community about the nature and prevalence of ATS related harm – for example, many participants believed that in the community heroin was considered the major drug of concern, with little consideration of the harms arising from ATS.

For the community, much of the information about ATS use is provided by the popular media, which is sometimes sensationalist and/or inaccurate, and might contribute to barriers to effective prevention, law enforcement and treatment initiatives. It is suggested that, as well as implementing effective information and education campaigns, one needs to address sources of misinformation. For example, a number of commentators have suggested that

media guidelines should be developed similar to those for media reporting of suicide and mental illness (Penrose-Wall, Baume & Martin, 1999). Further, the Internet and peers also represent potential sources of misinformation. Thus, any campaigns related to ATS use, whether targeting current consumers, community members or preventing the uptake use, need to ensure the credibility of information sources and adopt strategies to regulate the quality and accuracy of the information provided.

In all community consultations strong concerns were expressed about the media's portrayal of ATS use and some commented that this had resulted in a kind of 'hysteria' that was ill-informed. In particular, there was concern about the over-emphasis on crystal methamphetamine use, and with the use of terms such as 'party drugs'. In addition, it was felt that significant emphasis had been placed on psychosis and little on the more prevalent mental health problems such as anxiety and depression. Such stories contributed to inaccurate understanding of ATS use and the associated harms and that they could have the unintended consequences of: glamorising or creating interest in ATS: confounding effective prevention and law enforcement strategies; contributing to misdiagnosis (for example, a number of people commented that any agitation was being inappropriately diagnosed as psychosis); and further marginalising consumers, having an impact of the probability of seeking and/or receiving treatment. It was suggested that guidelines or a code of conduct be developed in partnership with the media about reporting about drug use, in particular ATS use. This approach was emphasised in the submission from the Australian Psychological Society (APS), which stated that there was a need to:

develop more sophisticated and informed responses and advocacy to the media on the issue of ATS and advocate for the development of a Media code of conduct around the reporting of ATS and other drug incidents.

Similarly, Turning Point Alcohol and Drug Centre noted that:

...the recent media focus on the extreme effects of crystal methamphetamine has not been helpful in encouraging users into treatment. These media reports may result in users who are less severe believing that they do not require intervention unless they are experiencing extreme problems, and also becoming more reluctant to seek treatment for fear of being classified as a 'hard drug user'.

### 4.3 Reducing associated problems

While many campaigns are directed toward reducing the appeal of drugs and preventing, or delaying, the onset of use, others aim to reduce specific drug-related problems and risky behaviours among current users. Thus, the prevention of drug-related problems needs to be able to identify and reduce significant patterns and contexts of risky drug use. Adapting a classification system developed by the World Health Organisation (WHO), Loxley and colleagues (2004) outlined four main categories of drug use patterns that need to be addressed in terms of related risks and potential harms. These are: mode of administration (e.g., swallowing, inhaling, smoking, injecting); intoxication; regularity of use; and, dependence. Each of these categories may have effects in several domains, such as: developmental effects (e.g., use during pregnancy); physical health effects (e.g., blood borne virus transmission, nutritional deficiencies); personal safety issues (e.g., injury to self

and/or others); mental health effects (e.g., depression, psychosis); and impact on social wellbeing (e.g., legal problems; financial issues).

The key aims of such strategies have been described to include: preventing harm to other people; preventing transition to injecting drug use; promoting healthy lifestyles and drug-free activities; raising awareness of the harms and negative consequences of drug use; and, informing users of the legal implications of their use (e.g., see NSW Health, 2005). Thus, it is argued, important aims are to: inform users about the risks of, and other consequences (e.g., legal) of, use; identify high-risk users and prevent their transition from occasional use to heavy use patterns and/or riskier methods of use, such as injecting and, in the case of crystalline methamphetamine, smoking; and prevent harm to other parties (e.g., children; parents/carers; associates and friends).

To reduce harms among those already engaged in regular ATS use, attention to date has included reducing the risk of infectious disease, managing sleep and nutritional disorders, and helping avoid and manage relationship problems. With specific regard to the recent use of crystalline methamphetamine, examples of possible targets for campaigns include information about the particular risks of smoking and injecting, information on blood borne viruses, amphetamine-induced psychosis, depression, and anxiety, awareness of the consequences of the 'binge-crash' cycle, and improving contact with health care services. In order to achieve this, it will be necessary to explore users' own perceptions of what information is important to them and identify the current barriers to service use.

As identified in the Inquiry into Amphetamines and 'Party Drug' Use in Victoria (Drugs and Crime Prevention Committee, 2004) a range of harm reduction strategies have been employed with ATS. These have included:

- Mass media education and information campaigns;
- Safe rave or safe dance party guidelines aimed at club owners and rave promoters;
- The use of outreach workers to provide support and assistance to those who use 'party drugs' (often located at raves and venues);
- Testing stations or kits for 'party drug' pills and tablets;
- 'Self regulation' harm reduction measures of users themselves;
- Information pertaining to harm reduction and 'safe' drug use provided and shared at international and national conferences and seminars; and
- Harm reduction strategies and education campaigns that are targeted at particular times of the year where it is thought ('party') drug use may be particularly prevalent. (p.502).

An example of a harm reduction campaign for current amphetamine users was the 'Speedwise-Speedsafe' campaign. This campaign used postcards distributed at nightclubs, dance venues, pubs, needle and syringe programs, health services and shops. Information related to hydration, nutrition, avoiding 'binge' use, harms of combining alcohol with amphetamine, and risks related to HIV infection if injecting. This campaign was not rigorously evaluated, with feedback obtained from 34 amphetamine users (Berg,

1994). Significant improvements were only found in regards to knowledge of syringe cleaning procedures and the associated risk of concurrent alcohol and amphetamine use (Kamieniecki et al., 1998).

### Targeted campaigns

As with prevention campaigns, strategies aimed at reducing harms associated with ATS use need to be targeted toward those known to be at risk of such harms or towards high risk behaviours/contexts of use (e.g., use in relation to driving; use at work). Thus, campaigns may be targeted toward particular sub-populations such as gay, lesbian and transgender populations, injecting drug users and ecstasy users, or toward particular types of ATS, with regard to form and content or to particular settings such as entertainment venues or in relation to particular work practices.

The issue of targeting specific risk and harm factors was raised in a number of written submissions. NDARC made mention of the need to reduce the risk of blood borne virus (BBV) transmission among injecting ATS users, and targeting messages warning of the risks associated with BBV infections toward young people prior to uptake of injecting ATS use. Also, the need to address sexual risk behaviour was emphasised, particularly among methamphetamine injectors who report higher levels of such behaviour than other injecting drug users, and among men who have sex with men. Because of the particular risks associated with certain patterns of ATS use, the Australian Drug Foundation (ADF) highlighted a need to target strategies that address polydrug use and bingeing among ATS users. In their submission, the private company 'Convenience Advertising', suggested that it was important to disseminate strategically planned public health communication programs, termed 'narrowcasting', in campaigns to target ATS use, particularly for young people, men who have sex with men, and those working in the hospitality industry.

The issue of the diversity of patterns of ATS use demanding diverse responses was noted in the written submission from the Victorian Alcohol and Drug Association (VAADA):

Given the diversity of patterns of ATS use, it is highly unlikely that any blanket response to ATS use would be successful. ATS users are very diverse, and it is unlikely that they all have the same treatment needs. Potential ATS users will be drawn from a similar assortment of social groups, and it is improbable that a monolithic treatment campaign would effectively target all the different people who might potentially use ATS.

The recommendation for targeted campaigns was also a central theme across consultations. However, there were diverse views concerning the exact nature of interventions. Some participants argued for strategies that aimed at specific subgroups of consumers (e.g., young people), while others were of the opinion that strategies should be designed around particular patterns of use (e.g., 'binge' use). Some suggested focussing on stages of use (e.g., "recreational" users, or those using occasionally) with others suggesting that the different types of ATS indicated the need for drug specific interventions (e.g., ecstasy versus methamphetamine). A fifth categorisation was proposed in relation to the various functions of particular drugs for consumers (e.g., people who use ATS to facilitate workplace performance versus those who use ATS as part of a social activity). It was acknowledged that any targeting of harm reduction strategies would need to take account

of the fact that frequently people who use ATS may well be using other drugs. For example, some use a variety of drugs to manage the come down effects of ATS, while some will be coincidentally intoxicated on ATS and alcohol. In addition, a large number of participants commented on the challenge of accessing the 'hard to reach' and/or 'hidden populations' who use ATS, particularly given that the perceptions of use and patterns of use might not bring many consumers into contact with helping services. It appears that while there is some agreement on the need for targeting strategies, there needs to be some work focusing on how such targeting should be informed.

#### Gay, lesbian, bisexual and transgender populations

As noted in Chapters 2 and 3, global research indicates an association between drug taking and unsafe sexual practices among men who have sex with men (MSM). In particular, methamphetamine use has been associated with increasing STI/HIV transmission rates among this population (Boddiger, 2005; Halkitis et al., 2001). This highlights the need for prevention campaigns targeted specifically at ATS use within these populations, particularly in light of the social stigma experienced by these groups that creates difficulties in access and delivery of services.

In 2005, ACON and NDARC conducted research of crystal methamphetamine and GHB use among gay, lesbian, bi-sexual and transgender populations (GLBT) in NSW (Degenhardt et al., 2005). This report identified the following key issues for GLBT:

- Limited understanding of psychosis amongst those using methamphetamine;
- Consumers presenting to GPs did not disclose their methamphetamine use;
- There was an increase in consumers seeking treatment for methamphetamine use, however few treatment modalities and culturally appropriate interventions are available;
- Community concern tends to focus on drug use among gay men, however, use of crystal methamphetamine appears to be as prevalent among lesbian and bisexual women;
- More information on methamphetamine and associated harms needs be provided to consumers, frontline services and workers in the HIV sector; and
- Culturally sensitive GLBT training needs to be conducted with generalist AOD services.

It is pertinent to note that research is currently being conducted that may inform future initiatives. For example, the Australian Research Centre in Sex Health, La Trobe University is investigating patterns of crystal methamphetamine use among homosexual populations of both genders.

Interventions have been demonstrated to reduce risks, and drug treatment services are an effective site for intervening in high-risk behaviours and in particular reducing HIV risk behaviours among methamphetamine users. In particular, cognitive behaviour therapy (CBT) -based treatment approaches have been developed specifically to reduce sexual risk behaviour among gay and bisexual males (Shoptaw et al., 2005). A recent study by Mausbach and colleagues (2007) examined the efficacy an intervention for reducing sexual risk behaviour among HIV-positive, methamphetamine-using MSM within the context of

ongoing drug use. That is, the exclusive focus was on changing sexual behaviour only. The study found that those assigned to the safer sex behavioural intervention engaged in significantly more protected sex acts at both 8-month and 12-month assessment times (Mausbach et al., 2007). However, in general, there are few HIV prevention interventions that target drug-using MSM, particularly non-injectors.

### Injecting Behaviours

Injecting behaviours are a particular concern in relation to people who are dependent on ATS (generally, dependent on methamphetamine). In Australia, the majority of dependent methamphetamine users inject the drug, and methamphetamine accounts for around one-third of injecting drug use in Australia (Iverson et al., 2006). This has important implications for the spread of blood-borne viruses, such as HIV and particularly hepatitis C, which is endemic among injecting drug users in Australia (National Centre in HIV Epidemiology and Clinical Research, 2007).

While earlier research suggested that those who inject methamphetamine do not appear to differ in their level of HIV risk behaviour compared to their heroin injecting counterparts (Hall et al., 1993), some evidence indicates that those who use ATS have a lower perception of risk. For example, HIV is perceived as a risk for people who inject heroin, as opposed to a risk for those who inject any drug, including amphetamine (e.g., Vincent et al., 1999). Consequently, it has been argued that a comprehensive strategy needs to be maintained to reduce the risk of blood borne virus transmission among all injecting drug users, including those who inject methamphetamine.

Harm reduction messages warning of the risks of blood-borne viral infections (BBVIs) associated with injecting drug use are also indicated. These messages should, perhaps, particularly target young people prior to their uptake of injecting drug use, because much of the literature indicates that early onset injecting drug users are also higher risk takers in relation to their health (such as increased risk of sharing needles) (Fennema et al., 1997; Battjes et al., 1992). Thus, newer and younger initiates to injecting drug use are at greater risk of contracting and transmitting blood borne viruses.

Commencing in August 2002, AIVL conducted a research project to investigate the hepatitis C transmission risks amongst methamphetamine injecting drug users that was completed in March 2003. A questionnaire (the PSU Tool) was developed and 182 injecting psychostimulant users were interviewed across Australia. The findings were reported in the 'National Snapshot on Hepatitis C Transmission Risks Amongst Injecting Psychostimulant Users' (available from AIVL website). Among the main findings were that, although almost the entire sample reported seeing hepatitis C information, there were mixed levels of knowledge about the condition. In addition, approximately 29% were 'concerned a great deal' about contracting hepatitis C, while responses to other items revealed that many were engaging in unsafe injecting practices. One of the conclusions drawn from the research is that opiate users may be more aware of the risks associated with injecting than psychostimulant users, as opiate users have more commonly been the focus of harm reduction messages associated with blood borne virus transmission.

Sexual risk behaviour is a further consideration in the context of HIV transmission among those who inject methamphetamine because they report high levels of sexual risk behaviour, for example when compared to heroin or other injecting drug users (Klee, 1997; Vincent et al. 1999; Zule & Desmond, 1999). The risk of sexual transmission of HIV is further exacerbated by the concurrence of other sexually transmitted diseases, such as Chlamydia and Gonorrhoea, which have recently been described as being at epidemic levels among injecting drug users in Australia (National Centre in HIV Epidemiology and Clinical Research, 2007).

With regards to strategies targeting injecting drug users, a number of participants in the national consultations noted the need for Needle and Syringe Programs (NSPs) to provide out-of-hours access to information and advice, and build links to other services, such as drug withdrawal and treatment services, especially for otherwise hard to reach groups that might not access treatment services. Also, given the high risk of BBVs for those who do inject, it was argued that a variety of health and community services could enhance the provision of information about the risk of BBV and, where possible, particularly encourage at-risk groups, including health staff, to access Hepatitis B vaccinations.

#### Ecstasy users

A variety of ATS harm reduction strategies were implemented in the 1990s, mostly directed at the use of drugs such as ecstasy. Some related to adopting a 'healthy settings approach', which recognises that the effects of any particular setting on an individual's health are related to the general conditions within that setting (WHO, 1997a). Focusing on ecstasy use within nightclubs, Bellis and colleagues (2002) illustrated the wide range of factors, in addition to any focus on drug use, which might need to be considered in an effective harm reduction approach:

- Dehydration and hyperthermia;
- Fire risk;
- Noise levels and damage to hearing;
- Sexually transmitted infections (STIs) and unwanted pregnancy;
- Accidents;
- Violence;
- Drink/drug driving, and
- Tobacco use.

This broad range of risks led them to suggest that there was a need to train venue staff (e.g., door staff) to be able to effectively discriminate risks associated with intoxication from various drugs and effectively and safely manage patrons, ensure that there is adequate lighting and ventilation, ensure effective public transport system and liaison with law enforcement staff.

Other researchers have likewise suggested a broad range of strategies to reduce drug related risks (in particular those associated with ATS use) at entertainment venues, including:

- Preventing overcrowding;
- Managing ambient temperature at low risk levels;
- Providing cool or 'chill-out' areas;
- Providing free and ready access to water; and
- Providing a first aid room.

(See Drugs and Crime Prevention Committee (2004) for a more detailed summary).

Similarly, Hando and colleagues (1998) argued that Australian protocols for entertainment venues (i.e., clubs and dance party) were needed to ensure the provision of adequate water, ensure effective ventilation and ambient temperature management, effective crowd control and provision of first aid areas, chill out rooms and regular monitoring of patrons well being. This led to work on Australian guidelines for rave promoters and nightclub owners to increase the safety of dance parties. The National Protocols for Conducting Safer Dance Parties were subsequently developed and made recommendations related to adequate provision of water, ventilation, 'chill-out' areas, medical assistance, security checks, and information for users.

Further guidelines were produced from the 'Reducing Drug Harm in the Dance Party Scene Project' conducted Drug and Alcohol Services South Australia (DASSA) and South Australian Police. 'The Guidelines for Safer Dance Parties' related to:

- Basic safety;
- Temperature and ventilation;
- Chill-out areas;
- Availability of drinking water and food;
- Alcohol licensing;
- Venue capacity and crowd management;
- Security and door staff;
- Communication systems;
- First aid and medical emergency action;
- Community education;
- Toilets;
- Emergency service consultation;

- Cleaning up;
- Transport options, traffic management and signage;
- Insurance; and
- Consultation (DASSA & SA Police, 2006).

The Drug and Alcohol Services Council (DASC) in partnership with the Office of the Liquor and Gambling Commissioner, Australian Hotels Association (South Australian Branch), Clubs SA and South Australia Police targeted use in licensed venues in conducting the 'Illicit Drugs and Licensed Premises' project. The project aimed to reduce harms associated with illicit drug use in and around licensed premises by enhancing the ability of licensees to respond to illicit drug issues. The project led to development of a kit that included patron education resources, strategies for licensees to adopt to reduce the prevalence and associated harms of illicit drug use, answers to commonly asked questions, and a checklist of individual signs and symptoms of drug use. A successful pilot of the project was followed by distribution of 1000 kits to liquor licensees in 2002.

These issues were also raised during consultations. It was proposed by a number of participants that entertainment venues should take more responsibility for looking after their patrons, for example, by providing water, and encouraging the presence of outreach workers in clubs and at dance event.

Given that many ecstasy users do not come into contact with treatment services, targeting ecstasy users through peer education has also been utilised as a harm reduction strategy, as outlined earlier. Other harm reduction interventions have focused on information provision using various media to communicate information about particular risks. 'Project E', conducted in 1997, included the dissemination of brochures, fridge magnets and postcards providing information and advice to users. Street press, such as 'Onion' in South Australia and 'Big Book on Party Drugs' in Victoria have also been used to promote harm reduction messages. 'Project E', an ecstasy education kit was launched in 1997, and various information booklets are available such as 'Rave Safe' and 'Ecstasy: Facts and Fiction' (see Dillon, 2000). All these resources provide young people with information about the various drugs, the short- and long-term effects of use, associated risks, advice on how to increase the safety of use, and emergency responses to adverse effects (Stubbs et al., 2004). Finally, internet sites such as 'Somazone', 'pillreports' and 'bluelight' all provide information about drug content, the effects of ecstasy use, and how to reduce related problems. Unfortunately, as is the case across this area, comprehensive evaluation is limited and bold conclusions cannot be reached about the value of particular approaches.

New research by Duff and colleagues (2007) aimed to explore the social and cultural context of use of ecstasy and related drugs (ERDs) in Victoria. Using a combined research methodology consisting of participant observation by field workers, interviews with current users, case studies of current and ex-users and key expert interviews, the researchers proposed several recommendations for both prevention and harm reduction approaches to ERDs, as follows. Recommendations for prevention strategies are:

1. Need to be sensitive to relevant cultural and contextual differences in relation to both populations and geographical regions;
2. Involve more extensive and meaningful peer-to-peer components by integrating initiatives into existing peer networks;
3. Include peer education strategies;
4. Messages about potential risks associated with use must be evidence-based and even-handed;
5. Emphasise the more 'ordinary' risks, such as social embarrassment, harm to relationships, comedown;
6. School-aged prevention strategies should retain abstinence focus, while adhering to the recommendations above;
7. Consider strategies to strengthen and improve communication between young people and their parents;
8. Make use of information networks of most relevance to young people, such as the internet and mobile information technologies;
9. Develop context-specific ERDs prevention materials (e.g., in bars and clubs, rural settings etc) further tailored to particular sexual and cultural communities; and
10. Need specialised materials tailored to young and novice members of clubbing and rave communities.

Duff and colleagues (2007) also made the following recommendations for harm reduction strategies:

1. Focus on reducing the incidence and prevalence of polydrug use and binge ERDs use;
2. Pilot a 'clubsafe' initiative to deliver ERDs-specific harm reduction materials in non-rave settings (e.g., clubs and bars);
3. Continue collaboration with key stakeholders (e.g., club owners, DJs), including delivering harm reduction messages within venues;
4. Convene local club and bar stakeholder working groups to oversee and coordinate all local ERDs initiatives in licensed settings;
5. Undertake a formal pill-testing pilot in conjunction with Victoria Police Forensic Services;
6. Develop context-specific ERDs harm reduction materials (e.g., in bars and clubs, rural settings etc) further tailored to particular sexual and cultural communities;
7. Increase users' awareness of the harms they are experiencing via delivery of a self assessment tool through the internet and general health services;
8. Tailor interventions according to different points in drug use career; and
9. Use a variety of formats, including improved electronic delivery.

## Assessing the risks of illicitly manufactured drugs

One area of contentious debate has revolved around the fact that illicitly manufactured drugs are of varying potency and purity, and, it is argued, this is relevant for strategies that seek to prevent and reduce drug related problems. Due to their illicit status, ATS cannot be monitored and batches of illegal drugs, particularly adulterated ecstasy tablets, have been reported in relation to increased risk of morbidity and mortality. For example, the media reports of 'Doctor Death' refer to PMA (para-methoxyamphetamine) being sold as ecstasy and resulting in the death of a young person in Sydney. Thus, some have argued that more regular forensic analysis of seized drugs and information from health, police and consumer groups should be assessed and alerts made for particular risks and disseminated (e.g., see Webb, 2003).

Variation in illicit drug potency and purity, and consequent variations in hazards has resulted in contention about the role of 'pill testing kits'. Large scale testing of ecstasy tablets at parties and agencies of the Drugs Information and Monitoring System has been undertaken in the Netherlands since 1992. Laboratory analyses using gas chromatography and mass spectrometry have identified a range of substances including LSD, amphetamine, 4-MTA, DOB, 2CB, atropine and wide variations in the amount of MDMA detected (Henry-Edwards, 2001). Testing of tablets, by volunteers, has also been conducted in the US by the 'Dance Safe' organisation.

However, in Australia, unlike some areas of Europe, pill testing contravenes legislation regarding the possession and supply of controlled substances (Camilleri & Caldicott, 2005). Any pill testing in Australia has been conducted by volunteer harm reduction organisations and individuals conducting their own testing using the most common testing kit which employs a chemical mix called a 'Marquis Reagent'. It can indicate the presence of MDMA-type substances (MDMA, MDA, MDE), amphetamine, 2CB/2CI, dextromethorphan (DXM) and opiates. The 'Mandelin Reagent' also tests for MDMA-type substances and amphetamine, so using the two tests in conjunction increases the reliability of the results for these two substances. In addition, the 'Mandelin Reagent' test indicates the presence of ketamine and PMA (Enlighten, 2005).

Although reagent pill testing kits provide some information about the content of pills, there are limitations in the information that such kits can provide. First, pills sold as ecstasy may contain more than one psychoactive compound, yet reagent testing kits will only indicate the most prominent substance. Second, while indicating the presence of a substance, testing kits are unable to indicate the amount in a pill so, critically, they do not provide information on purity. Third, there is concern about the subjective nature of the interpretation of test results, which may potentially lead to inaccurate conclusions. Fourth, the results of such analyses have varying degrees of reliability, depending on which substance is indicated, and the number of tests used. Finally, although both the Marquis and Mandelin kits can identify the presence of MDMA-type drugs (MDMA, MDA, MDE), they cannot differentiate between these drugs. Further criticism of 'pill testing programs' is that they could be interpreted as condoning drug use (Dundes, 2003; Murray et al., 2003; Winstock et al., 2001) and any implication they have 'passed' the pill test potentially offer an additional incentive to take the drug (Dundes, 2003; Murray et al., 2003; Winstock et al., 2001). It is also important to point out that while particular formulations and purity levels may be detectable, high levels of purity may still be associated with substantial drug, environmental and individual risk factors.

Despite these limitations, some people have argued that pill testing has potential as a harm reduction measure. It has been suggested that the approach can be viewed as consistent with the harm reduction perspective of promoting the right of drug users to make informed decisions about their own drug use and its consequences (EMCDDA, 2001). For example, some have proposed that on-site pill testing facilitates the avoidance of specific pills or may otherwise modify drug use based on test results. An unpublished study conducted at an outdoor rave in South Australia found that 83% of people who received an unexpected test result stated they would do something other than just take the pill, including the most common response to not take it (26%) (Caldicott, 2005, cited in Johnston et al., 2006). It has also been argued that potential users of ATS are likely to pay more attention to health messages if they are perceived as reliable and this may directly relate to the perception of obtaining accurate information about pill content. Others have suggested that pill testing programs have the capacity to function as early warning campaigns if pills are identified that pose an acute health threat (van de Wijngaart et al., 1999). Thus, on-site pill testing programs may facilitate links between event organisers, first aid and security staff through the exchange of information about the pills in circulation at events, and anticipated drug-related problems (Benschop et al., 2002; European Monitoring Centre for Drugs and Drug Addiction, 2001; van de Wijngaart et al., 1999). They may also have the potential to enhance existing public health surveillance of synthetic drug markets (Benschop et al., 2002; European Monitoring Centre for Drugs and Drug Addiction, 2001; Spruit, 2001) by providing data collection opportunities.

However, as already indicated, there is opposition to pill testing and examination of this is also pertinent. First, aspects of the procedures are contrary to some legislation. Second, many of the pill testing kits provide modest information, that may be quite risky if there is a lack of clarity about what the results do and do not tell a person. Third, even the knowledge that a pill is totally or mostly what the person thought it was (e.g., pure MDMA) does not confer an indication of safety – many adverse reactions to ecstasy have occurred as a consequence of consuming high purity MDMA. Fourth, the evidence about the alleged benefits is largely lacking and concerns about the potential negative effects (condoning use; encouraging use) not sufficiently allayed. For example, Winstock and colleagues (2001) noted:

In a recent study of over 1000 UK clubbers, subjects were asked how the quality of ecstasy pills would influence the amount of drug they consumed. Subjects indicated that if the quality of pills was considered to have become worse over 20% would take more, just over a third would take less, with 40% reporting no impact upon their ecstasy use. Conversely, and perhaps more worrying, if pills were thought to improve, 40% reported they would take more, just over 10% would take less, with nearly half reporting that it would make no difference to their use (pp.1145-1146).

The issue of pill-testing was raised at almost all consultations and it was evident that the issue was contentious, with some strongly supporting the approach and others strongly opposed. Concerns were expressed about the efficacy of testing kits, the impact of such initiatives and whether any endorsement or support of pill testing appeared to condone use or imply a 'pure' drug was a 'safe' drug.

## 4.4 Challenges of applying prevention and harm reduction strategies to amphetamine-type stimulants

There are a number of challenges in any attempt to apply prevention and/or harm reduction approaches to ATS use and related problems. In particular, a large number of ATS users do not perceive themselves as drug users and do not access many of the services or resources that may be accessed by other drug consumers. Furthermore, as indicated above, there are diverse target groups suggesting that there may be a need to develop specifically targeted and appropriate approaches.

At present, there is only limited evidence to guide the implementation of ATS-specific strategies to prevent and reduce problems, and most of this has focused on specific campaigns and peer-interventions. Although a range of interventions have been implemented, most reports are descriptive and thorough evaluation and formal publication are often lacking. Based on a general analysis of prevention, Hando and colleagues (1999) suggested the following key principles be adopted in designing harm reduction strategies:

- Comprehensive and consider the full range of social influences and institutions on use;
- Sustainable;
- Clearly targeted, particularly regarding age and stage of drug use;
- Developmentally appropriate and culturally sensitive;
- Based on research knowledge and use of sound methods;
- Clear objectives;
- Reduce risk factors and increase protective factors; and
- Evaluated for both positive and negative effects.

Gowing and colleagues (2001) reviewed prevention activities specifically in relation to ecstasy. As in other research, they noted that it was critical to base any prevention strategies on an understanding of the subjective functions that the drug might serve. Consistent with research with other drugs, they observed that subjective functions of drug use are likely to be more influential on decisions to use and continue using than knowledge or experience of negative effects. Observing no compelling evidence for preference for any particular approach, they identified the criteria that underpinned successful programs. These included:

- Target clearly identified settings and cultures;
- Subsequently tailor interventions for specific groups;
- Adopt a multifaceted approach (e.g., schools, families, broad media; community and health services);
- Ensure integrated and consistent approaches and messages;

- Involve community and target groups in identifying/defining problems and solutions; and
- Implement longer-term programs, which have a more enduring impact.

In a review of drug use among young males in the United Kingdom, Boys and colleagues (1999) similarly noted that it was important to understand the factors that were related to ATS use and had influence on future use. The researchers also noted that positive reasons for using might well be more influential than potential and actual negative consequences of use. It was found that:

For amphetamines and ecstasy, .... There may be a tendency for social/contextual but not mood altering functions to be more influential on future use. ...

...our findings support the recommendation that educators and prevention programme planners should recognise the complexity of the reasons behind substance use and then encourage young people to seek alternative ways of fulfilling them (p.1049).

Such evidence is not an argument that people should not be made aware of risks and problems arising from drug use. Rather, it emphasises that the subjective nature of perceptions of risk and negative consequences should be taken into account in designing interventions and that focusing on negative consequences alone may be insufficient. This underlines the earlier observation regarding the limited impact of 'scare tactics'. It also underlines the argument for targeted interventions in their own right and accompanying broader, mass media campaigns:

It means mediating the monolithic messages of ... broad based campaigns and translating them into messages (and media) more appropriate to the numerous and overlapping social worlds which make up modern pluralistic societies. (Moore, 1992, p.89).

It is also pertinent to comment on the implications of recent communication developments. Many people access information (accurate and inaccurate) about ATS via the Internet. As already noted, concerns have been expressed that drug production and distribution are being facilitated by the Internet. For example, Klee (2001) advised that this was an emerging concern:

The range of information available through the Internet is unprecedented and some is potentially dangerous – not only on how to use the drugs but also how to make them. (p.31)

And:

The information about drugs that is available through the web is competition to be reckoned with and needs to be taken into account when mounting official information sites. (p.90)

The Inquiry into Amphetamine and 'Party Drug' Use in Victoria (DCPC, 2004) reported that various organisations had developed or were developing information and other interventions for use over the Internet, for example targeting young people (Drug Aware, Drug and Alcohol Office, WA; RaveSafe, Victoria; Somazone, Australian Drug Foundation). However, again there is limited research into the potential role of the Internet (and other emerging electronic media) in encouraging ATS use and/or in preventing use and reducing problems,

but a number of studies are now underway. For example, researchers at the National Drug Research Institute (NDRI) are exploring how web-based communications provide accurate and inaccurate information about illicit drug use, while researchers at the University of Tasmania are currently examining the effectiveness of internet-based delivery of harm reduction information.

A number of other findings from the Victorian Inquiry (Drugs and Crime Prevention Committee, 2004) can inform us how we might maximise the effectiveness of ATS-specific prevention strategies. It was emphasised that there was a need to consider the reasons potential and actual consumers, such as young people, cite for using ATS, on both personal and social levels. Thus, for example, a recent international report on global trends in psychostimulant use identified that there is a common perception that amphetamine and ecstasy are more benign and socially acceptable than drugs such as heroin (United Nations Office for Drug Control and Crime Prevention, 2001). ATS may be attractive to some people, particularly young people, if they perceive that such drugs are associated with sociability, having less health risks, are relatively low cost, and have mood-enhancing effects (United Nations Drug Control Programme, 1996).

As in other reports, the Victorian Inquiry (Drugs and Crime Prevention Committee, 2004) also concluded that multifaceted approaches were likely to be the most effective. For example, it was recommended that any campaign addressing ATS should include:

- Peer-based strategies, including delivering information and education to prevent uptake of use and presence at events to provide harm reduction information and assistance;
- Youth media such as popular radio stations, should be used to communicate information and advice to young people who were regarded as one high risk group. Other electronic media were identified as pertinent in any approach that aims to engage young people;
- The Internet to communicate information and advice, not only to young people, but also parents, club owners, licensees, people working in the entertainment industry, and school staff;
- Information specifically targeting the needs of parents/carers/families;
- Information specifically targeting professionals who respond to ATS; and
- Interventions tailored to meet the needs of specific populations such as Aboriginal and Torres Strait Islander people, or high-risk groups such as people in the gay community.

In summary, it is again indicated that the various, and overlapping, target groups and the diverse patterns and contexts of ATS use and related problems, and the apparent limited impact of any single approach, demands the need for multifaceted approaches applying several strategies tailored to specific needs and circumstances.

## 4.5 Building the capacity of the workforce to engage in prevention and harm reduction

As many people at risk of, or currently using, ATS, do not come into contact with treatment agencies, or have a tenuous link with such services, workforce development strategies need to target a range of health professionals. Those likely to be affected include GPs, psychiatrists, mental health workers, accident and emergency staff, ambulance officers, youth workers, community health workers, staff from needle and syringe programs and consumer organisations. Thus, people in the workforce who come into contact with ATS users need to be appropriately informed and skilled to respond effectively to problems arising from the use of these drugs. This issue is addressed more comprehensively in Chapter 5 ('Treatment'), but briefly introduced here.

Given the identification of GPs and community health services as services commonly accessed by ATS consumers, it was suggested by a number of participants at consultations that GPs could take a critical role in communicating harm reduction messages and information. It was suggested that many patients might attend their GP for problems that are potentially ATS related (e.g., sleep disorders; depressed mood). As noted by one participant, these clinical encounters provide an opportunity to screen for ATS use and provide information about harm reduction and, where indicated, referral for further treatment:

Primary health care providers such as GPs, represent an entry point and should be mobilised into a harm reduction role and given better referral pathways.

It was suggested that screening programs for ATS use could be established at a range of points of contact where high-risk individuals congregate or present for advice, such as sexual health clinics, community health centres and so on. For example, one participant who self-identified as a youth worker, argued it was important to:

Engage consumers in an appropriate environment and context to provide immediate support and referrals whilst offering safer sex products and practical harm reduction information.

Health workers need to be aware of the warning signs of escalating use and increase the capacity for self-assessment among users (NSW Health, 2006). In addition, information is needed regarding drug pharmacology and interactions, and the immediate and long-term effects of ATS use. Given the unpredictable nature of some ATS presentations, training in effective interventions, dual-diagnosis, primary mental health assessment skills, de-escalation skills and risk-management skills are likely to enhance worker confidence and capacity to manage acutely intoxicated users (NSW Health, 2006). In order to ensure staff and client safety, such education and training needs to be supported by the development of policies and procedures for working with ATS users, including the management of potentially violent clients.

A major project to develop training materials for health professionals working with ATS users was initially undertaken in Victoria under funding from the National Drug Strategy. This led to the development of a comprehensive training kit, 'From Go to Whoa: Amphetamines and Analogues, The Trainers Package for Health Professionals (Pead et al., 1996).

The pack included a video, trainers' notes, overhead transparencies, slides and a participant workbook. Materials were intended for those in primary health care settings and covered basic knowledge and attitudes, problems associated with ATS use and withdrawal. The package was disseminated through a national train-the-trainer workshop and evaluation concluded that it was an effective and low cost strategy for dissemination and utilisation of a training package (Allsop et al., 1999).

The 'From Go to Whoa' training package was subsequently revised by Turning Point Alcohol and Drug Centre in Melbourne to bring it up to date with current knowledge on psychostimulants. In 2007, the Australian Government Department of Health and Ageing provided funding for a national dissemination of this resource to assist in increasing skills and knowledge on psychostimulants, which will enhance the capacity of a range of workers to provide appropriate interventions to psychostimulant users.

Another national training program is the 'Amphetamine Education Resources (AER) Project' and the related 'National Amphetamine Training Package (NATP)'. In 2005/2006, Queensland, New South Wales, South Australia and Victoria collaborated to develop the AER, and by the end of 2006, all states and territories were involved. The resources are designed to assist Needle and Syringe Programs (NSPs), alcohol and drug workers, and other frontline workers in the delivery of brief interventions with amphetamine users. The resources included topic-specific information cards to assist frontline services conducting brief interventions, a recovery guide for consumers, and a manual for NSP workers and other healthcare professionals. NATP is delivered by Anex and provides train-the-trainer courses around the AER across the country. As the context of amphetamine use may differ across jurisdictions, the NATP was developed to be flexible and able to address local circumstances.

## 4.6 Summary

Many of the prevention activities that target illicit drug use in general have relevance for ATS use (e.g., school drug education; school drug policy; building community and individual social capital). Unfortunately, while there are a number of activities that aim to specifically prevent and reduce ATS use and related problems, there is a dearth of quality evaluations and scientific literature that can attest to the value of many of these strategies.

The Australian Government's National Drug Strategy includes funding for community awareness programs as a means of preventing drug use. Prevention and harm reduction strategies aim to prevent or delay the onset of drug use, protect against associated risks and reduce associated harms. Prevention strategies include, but are not limited to, mass media campaigns, school-based activities, peer education, and strategies targeted at specific groups or behaviours at high risk for drug use and/or related problems.

Mass media campaigns aim to raise awareness and provide information at a broad population level. Examples include the National Drugs Campaign and in relation to ATS, the 'Putting the Brakes on Speed' campaign. School-based activities are largely designed to prevent the initiation of drug use and are implemented in the education context. The Australian Department of Education, Science and Training has developed 'Principles for School Drug Education' to guide such activities, which, for example, have been applied

in designing the Resilience Education and Drug Information program. Peer education approaches have been used both to prevent the uptake of drug use and to reduce problems in those already using. Evidence suggests peer education is particularly suited to younger persons and in accessing populations that would not otherwise present to health or drug specialist services. AIVL has developed a framework for peer education and an example of such an initiative is RaveSafe, delivered by VIVAIDS in Victoria. With regard to ATS, campaigns are needed that specifically target young people; certain workplaces; Aboriginal and Torres Strait Islander people and CALD populations; parents and families; and the general community.

Harm reduction strategies generally target risks and harms of drug use associated with particular routes of administration, intoxication, regularity of use and dependence. Within these categories, strategies may be aimed at developmental effects, physical or health outcomes, personal safety issues, mental health consequences or impacts on social wellbeing. As with prevention strategies, particular groups and/or behaviours are associated with higher risks and harms. With regards to ATS, some targets that have been identified include gay, lesbian, bisexual, transgender populations; injecting behaviours; and regular users of ecstasy and related drugs. Also of consideration in harm reduction is the potential role of methods to assess the risks of illicitly manufactured drugs, such as tests of purity and content.

There are a number of challenges to applying prevention and harm reduction strategies to ATS use and related problems. Of note is the large number of ATS users who do not identify themselves as drug users and are therefore unlikely to access services or resources. Another issue in designing strategies is the need to target a diverse range of ATS users, using environments and user practices. At present, there is limited evidence to guide activities targeting ATS use.

A related issue is the need to build the capacity of the workforce to engage in and successfully implement prevention and harm reduction strategies. Again, this is complicated by the absence of contact many ATS users have with health and other services, and therefore a range of professionals need to be informed and trained in relation to ATS.

Both the literature and experience of many involved in the consultations indicate that the development of campaigns must anticipate outcomes which are evidence based. Strategies need to be targeted to particular populations (e.g., injecting users, professionals, long distance drivers), regions (e.g., urban, rural and remote), contexts of use (e.g., nightclub scene, home use) and specific types of ATS (e.g., campaigns will be different for ecstasy than for methamphetamine). They need to be informed by theories of attitudinal and behavioural change, and may benefit from the involvement of current or ex- ATS users in developing campaigns. Finally, a variety of media outlets including night venues, internet and other new technologies (e.g., mobile phones) should be used for wide dissemination of materials.

## Chapter 5: Treatment and Service Provision

### 5.1 Amphetamine-type stimulant treatment presentations

As indicated in Chapter 3, there are a number of adverse consequences arising from use of amphetamine-type stimulants (ATS). However, as noted in a review by Baker and colleagues (2004), many amphetamine users do not seek treatment and often have a weak relationship with treatment services in that retention rates are low. Earlier reviews observed that this was to some extent because the services were not perceived as being oriented to ATS users' needs and offered little in the way of specific treatment for ATS related problems. Rather, they were largely designed to provide treatment to alcohol and opioid problems (e.g., Kamieniecki et al., 1998; Vincent et al., 1999).

While the last decade has seen improvements in the knowledge base to guide interventions, and many services have mobilised to respond to the challenges set by increased ATS use, the clinical evidence base continues to lag behind that which exists for treating other drug problems, such as tobacco, alcohol and opioid dependence, and treatment links with people affected by ATS use remain tenuous. With this in mind, it is also pertinent to point out that many of the approaches used to engage and treat other drug dependent clients are relevant to working with ATS dependent individuals (e.g., building a therapeutic alliance; good assessment; identification of underlying and co-existing conditions; integrated as opposed to disaggregated care for co-existing problems).

Discussions focused on treatment were dominant throughout the consultation process. Some general observations included the need:

- To seek the input of drug users to determine what works;
- For specific ATS treatments versus blindly applying what works for other drugs;
- For more research to define a typology of different presentations matched to best practice in treatment;
- To adopt a holistic approach that addresses the broader socioeconomic issues rather than just the immediate presentation;
- To build the evidence-base to inform treatment; and
- To provide better support, resources and improved access in relation to treatment in rural and remote areas.

While acknowledging the observation that there is more limited use of treatment, recent Australian national data suggest that many ATS users do access treatment. The 'Alcohol and Other Drugs Treatment Services in Australia 2004-05: Report on the National Minimum Data Set' (Australian Institute of Health and Welfare, 2006a) is the fifth report in the series of annual publications that provides information about clients using treatment services in Australia by the principal drug of concern. Data contained in the Alcohol and Other Drug Treatment Services National Minimum Data Set (AODTS-NMDS) refer to 'closed treatment

episodes', which defines the period of contact from commencement to cessation between client and treatment agency. The latest data available from the AODTS-NMDS 2004-05 report that there were 135,202 closed treatment episodes for clients seeking treatment for drug use (Australian Institute of Health and Welfare, 2006a). Amphetamine was the fourth most common principal drug of concern, accounting for 11% (n=14,780) of treatment episodes after alcohol, cannabis and opioids. It is important to note that ecstasy accounted for only 0.4% of treatment episodes during this period, reinforcing the observation that few people access treatment services in relation to their ecstasy use.

Of the total closed treatment episodes, 52% (70,068) involved at least one other drug of concern (Australian Institute of Health and Welfare, 2006a). Where the principal drug of concern was amphetamine, 66% included at least one other drug of concern – in other words, polydrug use was relatively common among treatment seekers. When all drugs of concern are considered, 22% of treatment episodes included amphetamine as one of the drugs of concern. No differences in rates were found according to gender or Indigenous status. With regards to jurisdictional differences, amphetamine was the second most common drug of concern in Western Australia (26%) and South Australia (18%). For closed treatment episodes where the client reported amphetamine as their principal drug of concern, 82% reported being current or past injectors. This was second to heroin, reported by 91%.

With regards to the type of service accessed, The AODTS-NMDS 2004-05 indicated that counselling accounted for the highest proportion of closed treatment episodes (42%) where amphetamine was the principal drug of concern (Australian Institute of Health and Welfare, 2006a). This was followed by assessment only (16%), rehabilitation (15%) and withdrawal management/detoxification (13%). The median number of treatment days within a treatment episode was 20 days for amphetamine.

The Ecstasy and Related Drugs Reporting System (EDRS) includes data on regular ecstasy users' (REU) utilisation of health and medical services specifically in relation to their use of ecstasy and other drugs. In the 2006 EDRS, 22% of the national sample reported accessing medical or health services in relation to their drug use in the last six months (Dunn et al., 2007). Of these, the majority reported seeing a general practitioner (50%), followed by a counsellor (29%), and a drug and alcohol worker (24%). Smaller proportions reported attending an emergency department (16%) and a hospital (10%). Ecstasy was the drug most commonly reported as the main drug for which help was sought (EDRS samples regular ecstasy users), followed by crystal methamphetamine. For those who saw a GP, 31% reported accessing the service for ecstasy and 12% for crystal methamphetamine.

## 5.2 Initial engagement

Many people affected by ATS use do not initially attend specialist drug treatment services, but are identified by, or present to, frontline services. These include needle and syringe programs (NSPs), police, ambulance paramedics and hospital emergency departments (EDs). As the first point of contact for many people affected by drug use, these services are in a unique position to identify use and problems and offer assistance. However, they are also confronted with several challenges and risks. With regards to ATS use, perhaps the greatest risks relate

to the occurrence of amphetamine related agitation and amphetamine-induced psychosis, which can be accompanied by hostility and violent behaviour (see Chapter 3).

From 1999/2000 to 2003/04, amphetamine accounted for the largest proportion of all drug-induced psychosis separations, ranging from 41% in 1999/00 to 55% in 2003/04 (Degenhardt et al., 2007). In 2003/04, the total number of bed-days for amphetamine was 8068. The number of hospital presentations for amphetamine psychosis increased in a recent five year period, from 1028 in 1999/00 to 1626 in 2003/04 (Australian Institute of Health and Welfare, 2006a).

As indicated above, behaviours related to psychosis can be difficult to manage and pose a risk to the safety of police, ambulance and emergency health staff. Written feedback from a health worker at one of the consultations stated that:

it is frightening for doctors and nurses to have to deal with a psychotic (drug-induced) patient – the violence level is so tremendous and we do not have manpower to (manage) a psychotic person.

National guidelines have been developed specifically for police, ambulance staff, emergency departments and general practitioners on the emergency management of psychostimulant toxicity (see Jenner et al., 2004a; 2004b; 2006a; 2006b). In addition, guidelines specifically for the medical management of psychosis have been developed by the Drug and Alcohol Services Council of South Australia (DASSA): 'Guidelines for the Medical Management of Acute Methamphetamine-induced Psychosis' (McIver et al., 2006). The guidelines were prepared in order to aid emergency, general, medical and psychiatric staff in providing treatment in the emergency setting. The guidelines are based on the national and international literature, on clinical experience with methamphetamine-induced psychosis patients in Australia, and developed in consultation with and guided by experts from the fields of drug and alcohol treatment, emergency medicine and psychiatry. A stepped care approach is recommended, with guidelines covering assessment, medication and follow-up.

With regards to pharmacological interventions, these guidelines promote the use of benzodiazepines over antipsychotics. This is supported by recent research into the use of haloperidol in such cases. This has suggested a link of haloperidol use with the development of hyperkinetic movement disorders and seizures (Hatzipetros et al., 2007).

ATS-related presentations may not just involve psychotic symptoms, but the burden on frontline services remains high. A recent report by Gray and colleagues (2007) attempted to estimate the impact of amphetamine use on an inner city hospital. The authors found that amphetamine-related presentations accounted for 1.2% of all admissions. Of these, over half were habitual drug users, the majority were male, and the average age was 28 years. Presentations were of high-acuity, patients were often aggressive, required prolonged emergency department admission and extensive resources. Thus, emergency situations related to high levels of agitation and sometimes psychosis, present a challenge for law enforcement, ambulance staff, emergency departments and mental health services. This was noted in the written submission received from the National Drug and Alcohol Research Centre (NDARC):

Psychiatric emergencies associated with methamphetamine use are a particular concern. Guidelines for the management of psychostimulant toxicity have been developed for emergency medical services, frontline health workers and law enforcement personnel (Jenner et al., 2004a, 2004b, 2006a, 2006b). Such protocols are important for the maintenance of staff occupational health and safety in this context. Continued efforts to improve the management of psychiatric emergencies associated with methamphetamine use are required. Adequate resources also need to be provided to emergency services to ensure that these situations are managed safely and efficiently.

The issues for frontline workers depend somewhat on the service they provide. The main issues identified for ambulance workers related to the education of paramedics, responding to personal risk, sedation of patients (used for behavioural management for those experiencing psychosis), and total care time. For police, issues focus around the management of unplanned withdrawal of ATS-intoxicated persons in custody, and appropriate diversion to health services. With specific regard to NSPs, such services can generally provide brief interventions, health promotion and service access, but have, perhaps, historically been oriented toward heroin and other opiate users and ATS dependent clients may be more chaotic. Thus, there may be a need to implement some workforce development strategies to enhance responses specific to people affected by ATS use, including skills to engage clients during binge-crash cycles.

Currently, some provisions are in place in a number of jurisdictions to meet the needs of ATS presentations to frontline services. For example, Psychiatric Emergency Care Centres (PECC) and the Mental Health Emergency Care (MHEC) program are operating in NSW. PECC provide a 24-hour brief admission service within the emergency departments of select hospitals. PECC operate according to care pathways related to: self harm/suicide; early psychosis; drug-induced psychosis; depression/anxiety; mental and physical illness; and, relapse of serious mental illness. Similarly, the MHEC program aims to provide for people presenting to hospital emergency departments with acute mental illness or disorders which contribute to people being at risk of behavioural disturbance and/or drug related problems. There are currently 4 centres in NSW, which provide an opportunity for mental health triage, assessment and behavioural management within the ED for up to 48 hours.

Much discussion during the consultations related to the burden of ATS presentations on frontline services and the associated harms. This in part related to the need for improved workforce development, particularly regarding the management of aggressive and violent behaviour and methamphetamine-induced psychosis. While there was some debate about the prevalence of such presentations and the impact the media has had in propagating this image, it was agreed that when such presentations do occur, there was a need for protocols about responding to the patient and ensuring staff safety.

Related to this was the suggestion that dealing with increased violence had an impact on the levels staff tolerance for people affected by ATS use. It was suggested that some staff exhibit prejudice toward ATS users, as mentioned earlier. It was recommended that more education was needed to counteract attitudes and behaviour that contributed to poor engagement and treatment outcomes.

In relation to the need for specific training around ATS, in the written submission from the Australian Injecting and Illicit Drug Users League (AIVL) it was noted that:

Frontline service workers need training in defusing potentially difficult situations; communication skills to engage chaotic users; awareness of comorbid mental health issues; and available treatment options.

One of the major issues raised in all consultations related to the lack of integrated care between services. It was argued that there is a need for referral pathways to be established among all the relevant service providers (e.g., law enforcement; emergency departments, community health, drug specialist and mental health services etc.).

It was also noted in the consultations that law enforcement services are often the first point of contact for many ATS users and it was considered important to enhance behavioural management of ATS-affected people, to ensure safety for police and offenders. But there was also an identified need to build referral pathways, especially out-of-hours, when service provision was limited and when, paradoxically, ATS intoxication-related problems might be most likely expressed. Some law enforcement staff suggested that medical support is needed in the custodial environment, for example through having drug and alcohol nurses available to assist with the management and appropriate referral of ATS affected individuals. It was observed that one such initiative has been implemented in South Australia where nurses employed by DASSA have been placed at the Adelaide City Watch House.

Emergency departments were also a key initial point of contact with ATS affected patients. It was argued that emergency departments were not the best location for most presentations. A number of participants suggested that there was a need to establish an independent facility, in close proximity or adjacent to the emergency departments, that could provide a safe and supportive environment to manage intoxication and withdrawal. A number of consumers suggested that such an option was preferable to emergency departments or police lock-ups.

### Managing acute ATS toxicity

As noted in Chapter 3, acute ATS toxicity can result in a range of adverse outcomes, including cardiovascular and cerebrovascular emergencies, behavioural problems, serotonin toxicity and psychosis. Such problems, usually dose dependent, can occur in relatively naive as well as regular users (Dean & Whyte, 2004). Effective management requires staff to be able to accurately assess and diagnose the condition, and needs access to a safe environment (which in some, more severe, cases may require medical management), monitoring and, in cases of severe behavioural problems and psychosis, possible sedation. Pharmacological management may be complicated by polydrug use (e.g., co-existing alcohol intoxication). Although some research on managing cocaine toxicity may be relevant, unfortunately, the evidence to guide clinical practice is limited:

... studies related specifically to the management of amphetamine and MDMA toxicity are few. (Dean & Whyte, 2004, p.100).

As described earlier, despite the paucity of specific evidence, the challenges posed by ATS toxicity and evidence regarding general management of the various conditions prompted

the development of management guidelines for emergency health services, frontline health workers and law enforcement staff (Jenner et al., 2004a; 2004b; 2006a; 2006b). The effectiveness of their dissemination and adoption remains to be determined. Other guidelines have also been developed including the NSW publications, 'Amphetamines and Other Psychostimulants – A Guide to the Management of Users' and 'Clinical Guidelines for Assessment and Management of Psychostimulant Users', and the WA Drug and Alcohol Office (DAO) publication, 'Clinical Guidelines: Management of Acute Amphetamine Related Problems'. More recently, Turning Point developed treatment guidelines for methamphetamine dependence, which included management of acute toxicity (Lee et al., 2007). The recommended steps were: observation of clinical signs of toxicity, monitoring of vital signs, verbal de-escalation of situation if necessary, sedation as required and regular hydration and observation.

### 5.3 Treatment access and retention

The evidence indicates that ATS users represent a relatively 'volatile group' in respect to both access to, and retention in, treatment. A number of studies (e.g., Klee et al., 2001; Hando et al., 1997; Vincent et al., 1999) have indicated that traditional drug services have not been attractive to ATS users and there remain some reasons to believe that treatment engagement of people affected by ATS use is low compared to the number of people in need. For example, Kelly and colleagues (2005) estimated that only 10% of regular amphetamine users received formal treatment in any given year. Poor engagement and retention limits the ability of treatment to have impact (McKetin & Kelly, 2007).

Recent reports indicate that the problems of limited treatment engagement and retention are still issues (e.g., Shearer, 2007). Access to treatment does not appear to be randomly distributed among those who might be affected by ATS use. For example, research investigating characteristics of amphetamine users accessing treatment in NSW during 2002-03 reported that the majority of clients were English speaking, of low socioeconomic status, unemployed and were injecting drug users (McKetin et al., 2004). Research with dependent methamphetamine users in Sydney explored socio-demographic factors associated with receiving treatment (McKetin & Kelly, 2007). After adjusting for severity of methamphetamine dependence, factors predictive of not receiving treatment included being female, being born outside Australia and being in full-time employment. Methamphetamine smokers were also less likely to receive treatment than those who consumed the drug via other methods of administration. Similarly, Hillhouse and colleagues (2007) examined individual drug use and treatment characteristics as predictors of in-treatment performance and post-treatment outcomes over a 1-year period. A sample of 420 participants, from the Methamphetamine Treatment Project (MTP), was interviewed. Poor treatment engagement was associated with being female, more frequent use of methamphetamine, shorter history of methamphetamine use, smoking as the route of administration, and baseline depression. Poor treatment retention was associated with more frequent methamphetamine use, injecting drug use history, and use of methamphetamine during treatment. Non-completion of treatment was associated with shorter history of methamphetamine use, smoking or injecting methamphetamine, and methamphetamine use during treatment.

These studies replicate earlier reports. For example, Maglione and colleagues (2000) reported on treatment retention of over 2000 methamphetamine users in public outpatient services in California from 1994-1997 (a 45 month period). Overall, only 23% completed treatment, and drop out rates were higher for males. It should be noted that the treatment programs were lengthy (drop out was defined as not completing 180 days of treatment) and thus, this may be an indication of the fact that long term treatments are unattractive.

Luchansky and colleagues (2007) found completion rates for methamphetamine users in treatment compared well to users of other drugs. This study investigated a total sample of 12,726 adults and 2,715 youths receiving treatment for substance abuse in Washington State. Participants were compared according to primary drug, defined as alcohol, marijuana, methamphetamine, or 'other hard drugs' (cocaine, heroin, other opiates) and tracked for 1-year following discharge from a residential or outpatient treatment. Outcomes relating to completion of and readmission to treatment, and employment and criminal activity after treatment were measured. The general finding for both adults and youth was that outcomes for methamphetamine users were similar to those of users of 'other hard drugs', but not as positive as those of users of alcohol or marijuana. The one exception was in regards to completion of treatment, with adult methamphetamine users found to be significantly more likely to complete treatment than users of either alcohol or 'other hard drugs'. However, alcohol users were less likely to be readmitted to treatment than methamphetamine users.

A current Australia-wide project, led by NDARC with collaboration from Turning Point, DASSA, University of Melbourne, Queensland Alcohol and Drug Research Centre (QADREC), Griffith University and the National Centre for HIV Epidemiology and Clinical Research, is aimed at further enhancing understanding of treatment characteristics and issues for ATS users. The project will follow a cohort of dependent methamphetamine users in order to examine the characteristics of those entering treatment, differences to those not seeking treatment, factors predictive of abstinence, psychiatric morbidity, criminal involvement and contact with the health and criminal justice systems.

Some research has suggested that the patterns of ATS use may influence decisions to seek and remain in treatment. The lifestyle of those who engage in 'binge patterns' of use may disincline them to attend services, especially if it is believed that the treatment goal will be unattractive (e.g., abstinence). Baker and colleagues (2001a) found that few regular amphetamine users interviewed in their study wished to reduce or abstain from drug use, which has led some to conclude that a harm reduction focus should be an important element of treatment approaches.

Attracting and retaining ATS users in treatment has been a feature of a number of studies. For example, in relation to amphetamine, Wright and colleagues (1999) suggested that better information about treatment options should be communicated to users, resources specific to amphetamine should be available to staff, drop-in centres should provide advice and a link to treatment, workforce development strategies should be implemented to enhance staff skills and partnerships should be developed between general and drug specialist services. They also noted the importance of interventions targeting families. Others (e.g., Vincent et al., 1999) have made similar recommendations, including emphasising the need to build partnerships between drug specialist services and GPs, particularly because a number of studies (e.g., Hando et al., 1997; Vincent et al., 1999)

indicated that GPs were a preferred source of support for many people affected by ATS use. These various researchers and others have noted that ATS use can severely impact on relationships (e.g., impact of agitation, aggression, paranoia – see chapter on ‘Effects of ATS’) and this includes relationships with treatment services and the individuals in those services. The ability to establish a safe therapeutic alliance is central to any clinical endeavour – with people affected by ATS use, this assumes a greater importance (e.g., see Baker et al., 2004; Vincent et al., 1999; Wright, Klee & Reid, 1999; Wright & Klee, 2001). In addition, interventions need to be based on the factors that influence and underlie ATS use and the functions they perform (e.g., social functions; losing weight; self-medication of mental health problems).

One suggested option is the development of clinics that specifically provide treatment for ATS users. Turning Point Alcohol and Drug Centre in Melbourne is currently trialing two SMaRT Clinics, which are specialist methamphetamine treatment and research clinics. The clinics aim to build collaborative care relationships with a range of services to ensure smooth pathways into and out of ATS treatment, act as a training ground for alcohol and other drug (AOD) and mental health staff, and demonstrate a range of best practice interventions for ATS users. The project aims to use consumer consultation in the process of establishing the clinics which are to be staffed by community nurses, psychologists, addiction medicine specialists/GPs and psychiatrists. It is intended to conduct a detailed evaluation of the services.

Similar trials are being conducted in NSW with the Stimulant Treatment Programme established at St Vincent’s Hospital in Darlinghurst (Sydney) and in the Hunter New England region. The program provides a brief psychosocial intervention (8 sessions) within a stepped care framework. Preliminary data report 83 clients across the two sites who are predominantly male (75%) and aged 20-37 years (65%) (Dunlop & Tulloch, 2007). Three quarters of the clients at the New Hunter site and half the clients at the Sydney site are unemployed, and 55% across the sites are self-referred. The most common route of administration reported is injecting (70%), followed by smoking (24%). The majority of the clients are polydrug users, with cannabis (61%) and alcohol (59%) the most commonly reported drugs also used. Three quarters of clients had a mental health disorder, including 65% with depression, 36% drug-induced psychosis and 33% anxiety. Anecdotal reports from clients found that they were attracted to the service due to its stimulant-specific focus and perceived more generic AOD services as not understanding their particular issues and concerns.

During the consultations, a common theme related to the challenges of accessing treatment services for ATS users. It was suggested that this was due to limited treatment options and long treatment waiting periods. Concern was particularly expressed about limited access to withdrawal management and rehabilitation programs. Limited access to treatment was a particular concern for those located in rural and remote regions, an issue that was more evident for many Indigenous communities. The written submission from the National Indigenous Drug and Alcohol Committee (NIDAC) indicated that there was a specific need to enhance access to culturally secure drug treatment services for Indigenous people particularly in remote and regional areas. This would include providing locally accessible treatment and rehabilitation services and involve strategies that

addressed not only the drug user but the broader family unit and the provision of post-treatment aftercare and support. It was proposed that a critical component of any effective approach would involve building an Indigenous workforce that could prevent and respond to ATS use amongst Indigenous people.

## 5.4 Withdrawal management

The nature of ATS dependence, and coincidentally the nature of a withdrawal syndrome, has been debated until relatively recently. This has contributed to a situation where:

The literature pertaining to psychostimulant withdrawal is inconsistent and of mixed quality. ... no studies that describe the natural history of methamphetamine withdrawal among dependent individuals could be located and as a result that particular process is still poorly understood (Jenner & Saunders, 2004, p.103).

Although there have been some advances since this conclusion, there is still a dearth of information. What is known is that ATS withdrawal is distinguished from that which occurs with central nervous system depressant drugs such as alcohol or the opioids. The latter drug withdrawal syndromes generally result in symptoms that are the opposite of the drug effects, whereas for ATS, the symptoms might be similar to symptoms of intoxication, including for example agitation and arousal (Jenner & Saunders, 2004). The amphetamine withdrawal syndrome appears to consist of three primary symptom clusters: hyperarousal symptoms, composed of drug craving, agitation, and vivid/unpleasant dreams; reversed vegetative symptoms, consisting of decreased energy, increased appetite and craving for sleep; and anxiety-related symptoms, comprising anxiety, slowing of movement, and loss of interest or pleasure (Srisurapanon et al., 2001). A prospective study of methamphetamine withdrawal syndrome found moderate levels of depression during the first several days of abstinence, with minimal levels thereafter. The most prominent symptoms were anhedonia (inability to experience pleasure from normally pleasurable experiences), irritability and poor concentration (Newton et al., 2004).

More recently, McGregor and colleagues (2005) conceptualised the methamphetamine withdrawal syndrome as comprised of two phases: an acute phase lasting 7-10 days and a subacute phase lasting at least a further 2 weeks. The acute phase was characterised by increased sleeping and eating, a cluster of depression-related symptoms and less severe anxiety and craving-related symptoms (McGregor et al., 2005). Symptoms of mood lability, irritability, sleeping difficulties and cognitive deficits may persist for several months (Volkow et al., 2001).

From their review of the literature, Grabowski and colleagues (2004) concluded that there was a lack of clear protocols for appropriate withdrawal management of methamphetamine users. This was largely due to differing opinions among medical practitioners as to the most effective regimens and available research not supporting one medication over another. The role of pharmacotherapy in withdrawal management is outlined in a subsequent section.

An important clinical challenge has been to differentiate the symptoms of 'crash' (or the immediate 'come down' effects of ATS) from withdrawal. The former, not inconsistent with the 'hangover effects' of drugs, such as alcohol, occurs in the ensuing few days after

intoxication – the latter tend to commence towards the end of this period and are more enduring. The experience of withdrawal is generally related to the frequency and duration of ATS use, potency of drugs consumed, mode of use, severity of dependence and co-existence of physical and psychiatric conditions (e.g., see Jenner & Saunders, 2004). Symptoms include, in order of most frequently reported, irritability, aches and pains, depressed mood, and impaired social functioning (Cantwell & McBride, 1998). Symptoms can be protracted over several days to several weeks.

Jenner and Saunders (2004) suggested that ATS withdrawal:

- Can generally be managed on an outpatient basis (except where unsuitable home conditions or co-existing health concerns exist);
- Provision of safe psychosocial support in a non-threatening environment; and
- Can involve pharmacological symptom relief.

These authors also suggested a range of assessment protocols for assessing the potential risks of withdrawal to inform treatment planning and protocols to monitor and respond to the withdrawal syndrome. However, as with other researchers and clinicians, they note that there is a lack of a good evidence base to guide withdrawal management, and in particular, despite a range of current studies, their counsel that there is limited evidence about indicated pharmacotherapies still stands:

Recommendations for psychostimulant detoxification and withdrawal management ... tend to be based on clinical opinion and therefore management strategies may vary from setting to setting. The role of pharmacotherapies is currently limited, however benzodiazepines, antipsychotics and antidepressants if necessary are currently considered by clinicians to be the major components of a medicated psychostimulant withdrawal program (Jenner & Saunders, 2004, p.117).

These and other researchers (e.g., Vincent et al., 1999) also note that a significant proportion of people dependent on ATS may also be dependent on other drugs (e.g., alcohol, opioids), and therefore, the more established withdrawal management strategies for these drugs could be employed.

## 5.5 Psychosocial interventions

Psychosocial treatment modalities have most commonly been used to treat ATS users, in part because of the absence of a strong evidence base demonstrating the effectiveness of pharmacotherapies. Kamieniecki and colleagues (1998) reported that the following non-pharmacological interventions had been used with psychostimulant users: inpatient programs, therapeutic communities, 12-step programs, peer interventions, behavioural strategies, cognitive-behavioural interventions, multimodal treatment packages, and non-traditional methods such as acupuncture. Those which demonstrated the most efficacy were relapse prevention, cue exposure/response prevention, and multifaceted behavioural treatment. However, it was noted that many of the interventions had not been properly evaluated.

Research conducted in the subsequent decade suggests that cognitive behavioural therapy is the recommended psychosocial treatment for methamphetamine dependence in Australia (Baker et al., 2005). While this is supported by evidence from controlled studies, comparisons have not been conducted to test the efficacy of other psychotherapeutic approaches. Thus, evidence-based recommendations for psychosocial interventions must be considered in the context of limited research. As noted in the written submission from NDARC, new approaches are currently being explored, including mindfulness therapy (based on meditation techniques) narrative therapy (NT; based on an examination and reconstruction of a client's life history) and Acceptance and Commitment Therapy (ACT; combines mindfulness strategies with behaviour change strategies). NT is currently being investigated in addition to mirtazepine in a trial being conducted in WA and NSW, with preliminary findings suggesting that NT attendance is a significant predictor of treatment retention (Cruickshank et al., unpublished). A randomised controlled trial of psychotherapy for amphetamine use, comparing relapse prevention skills training with ACT is currently underway in South Australia. It has been noted that given the cognitive deficits experienced as a result of sustained methamphetamine use, such therapies that rely less on cognitive processes may prove beneficial in treating dependent methamphetamine users.

A review of treatment was recently reported by Shearer (2007) who identified 43 unique and original reports of randomised controlled trials of psychosocial interventions primarily targeted toward psychostimulant use, and 10 reports from clinical trials and long-term cohort studies. Interventions included behavioural (contingency management, cue exposure), cognitive (motivational interviewing, relapse prevention, cognitive behaviour therapy), psychotherapy, and abstinence-oriented (detoxification, residential rehabilitation, 12-step programs). It is important to note that most of these studies were conducted among cocaine users in the United States, which may limit the relevance for treatment of ATS users in Australia. It was also noted that the evidence base for psychosocial interventions for psychostimulant dependence is still limited, given there are insufficient controlled trials supporting one intervention over another. In this context, the following discussion is an overview of the most common interventions.

## Brief interventions

Brief interventions (BI) are usually considered pre-treatment tools or secondary prevention techniques with the broad goal of reducing or eliminating drug use to avoid or minimise associated problems:

Brief interventions aim to investigate a potential problem and motivate an individual to begin to do something about their substance use. The primary goal of a brief intervention is to reduce the risk of harm that could result from continued substance use. Brief interventions on their own can promote behaviour change, or can act as the first stage of more intense treatment (Baker, Lee & Jenner, 2004, p.68).

Recent adaptations include brief cognitive-behavioural interventions (BCBIs), which commonly consist of a motivational interview and skills training in the avoidance of high-risk situations, coping with cravings, and relapse prevention (Srisurapanont et al., 2007). Given that the efficacy of BI is largely contingent on the client's level of motivation, this intervention is usually considered most effective for people with no or low levels of dependence, unless

used to divert more severely dependent individuals into more intensive treatment. While the bulk of the evidence for BI relates to drugs such as tobacco and alcohol, they have increasingly been applied to illicit drug problems, including ATS use.

Srisurapanont and colleagues (2007) conducted a study aimed at evaluating the short-term benefits of BI for methamphetamine use disorders. A randomised controlled trial of BI compared to psychoeducation was investigated in youth aged 14-19 years old who met DSM criteria for methamphetamine dependence or abuse. Participants were students living in urban or suburban areas of Chiang Mai, selected due to the prevalence of methamphetamine use in Thai youth. The BI adopted was similar to that used in Australian studies (see Baker et al., 2001b, 2005), with the exception of the component of cognitive-behavioural therapy. The study found that while the frequency and amount of methamphetamine use decreased significantly in both groups, frequency of use for those in the BI group was significantly less than those in the psychoeducation group.

As noted, research conducted in Australia by Baker and colleagues (e.g., 2001b) has investigated the efficacy of BI in treating amphetamine users. This research has resulted in the development of a treatment guide for a brief cognitive behavioural intervention with regular amphetamine users (Baker et al., 2003). The intervention may comprise two or four sessions, with the four-session intervention consisting of motivational interviewing, coping with cravings and lapses, controlling thoughts about amphetamine use and pleasurable activities, and amphetamine refusal skills and preparation for future high-risk situations (Baker et al., 2003). Investigation of the effectiveness of the intervention was conducted in a randomised controlled trial with 214 regular amphetamine users in the Greater Brisbane Region of Queensland and Newcastle in NSW (Baker et al., 2005). The study found that there was a marked reduction in amphetamine use among the sample over time, and a significant increase in the likelihood of abstinence from amphetamine for those receiving two or more sessions (Baker et al., 2005).

While research has shown that BI can be effective with meth/amphetamine use, Baker and colleagues (2004) observed that, as many ecstasy users do not come into contact with treatment services, it may be appropriate to develop and evaluate the impact of specific brief and opportunistic interventions. These might be delivered in emergency departments, at events such as dance parties, in primary health care settings, in law enforcement setting and through computer/Internet media for remote/anonymous access.

### Cognitive behaviour therapy

As indicated, research into the efficacy of psychosocial interventions for people affected by ATS use is in its early stages, but support has been found for cognitive behaviour therapy (CBT). Such interventions usually progress through stages of motivational interviewing, instruction in cognitive-behavioural coping strategies and relapse prevention.

As discussed in the brief intervention section, Baker and colleagues (2001b) found brief CBT (in durations of either two or four sessions), superior in treatment outcome compared to participants who had been provided with self-help material. Both groups reduced amphetamine use, but greater rates of abstinence were achieved over the 6 month follow up in the CBT group. Other studies have demonstrated the value of CBT with cocaine

users, data that may be generalisable to ATS use (e.g., Crits-Cristoph et al., 1999). Brief CBT may also be effective in reducing psychological distress among amphetamine users. Feeney and colleagues (2006) found that a program consisting of refusal self-efficacy, improved coping, improved problem solving and planning for relapse prevention resulted in significantly improved scores on measures of somatic symptoms, anxiety, social dysfunction and depression among an Australian sample of 168 amphetamine users.

Baker and colleagues (2005) recommended that a stepped-care approach should be adopted. This involves the provision of intervention tailored to individual needs, with the employment of more intensive interventions as indicated by the degree of dependence and severity of problems experienced by the individual. Thus, those presenting at non-treatment settings may be involved in a structured assessment of amphetamine use and related problems, provided with self-help materials, and their use and harms regularly monitored. Those presenting to treatment settings may be offered two or more sessions of CBT, depending on extent of use and co-existing problems (e.g., depression).

### Contingency management

Contingency management (CM) is based on principles of reinforcement by decreasing the appeal of the drug via delivery of a reward for behaviour change/abstinence. Thus, clients receive incentives upon reaching therapeutic goals. In the United States, contingency management has been proposed as 'best treatment practice' for psychostimulant problems (Rawson, 1999; Shoptaw et al., 2006), largely based on research with cocaine users, although there has also been application to methamphetamine dependence. The most often cited reasons for not employing such techniques are the perceived cost and complexity, and doubt over whether it promotes enduring behaviour change (Kirby et al., 2006).

As part of the multi-site trial of the NIDA National Drug Abuse Treatment Clinical Trials Network, Roll and colleagues (2006) evaluated a contingency management intervention in which methamphetamine abusers submitting drug-free urine samples earned draws for chances to win prizes. No differences were found between this group and those in standard treatment for number of counselling sessions attended or retention in treatment. However, significant differences were found for more drug-free urine samples collected and longer period of continuous abstinence.

In a recent review of the literature on contingency management, Roll (2007) identified one laboratory study and four clinical assessments of the efficacy of CM in treating methamphetamine use disorders, and the most common method was voucher-based reinforcement therapy (VBRT). Roll concluded that adding such methods to other treatment strategies would increase in-treatment abstinence in many methamphetamine treatment settings. However, Roll cautioned against using CM in isolation to address methamphetamine use due to high levels of co-occurring problems.

The results discussed in this manuscript suggest that adding CM to many treatment strategies would increase in-treatment abstinence in many methamphetamine treatment settings. Given the relatively high levels of psychiatric comorbidity, medical comorbidity and criminal activity associated with methamphetamine use, I believe it would be unwise to treat this disorder with only CM. Instead, I recommend that CM be a component of

a holistic treatment strategy that addresses the psychosocial, medical, psychiatric and criminal justice issues that often co-occur with methamphetamine use disorders (Roll, 2007, pp.118-119).

### The Matrix Model

The Centre for Substance Abuse Treatment (CSAT) has been involved in developing and implementing a multimodal approach to methamphetamine dependence. The US Methamphetamine Treatment Project (MTP) appears to be the largest randomised clinical trial of psychosocial treatments for methamphetamine dependence to date. The Matrix Model utilised in the project is a manualised 16-week outpatient treatment approach combining approaches and resources developed within cognitive-behavioural principles, including positive reinforcement, family education, relapse prevention and 12-step program participation. The program also includes breath testing and urine screening for drug use. Rawson and colleagues (2004) evaluated the model in comparison to 'treatment as usual' with methamphetamine dependent patients. This resource-intensive intervention was found to result in some positive outcomes. 38% of participants were more likely to stay in treatment, 27% were more likely to complete treatment, and 31% were more likely to have negative methamphetamine urine test results. However, the Matrix Model did not produce superior outcomes at discharge or follow-up.

## 5.6 Pharmacotherapy

Various drug treatments, or pharmacotherapies, are used in relation to ATS dependence, to aid in withdrawal, to block drug effects, as replacement or substitution therapy, and/or to treat co-occurring and related psychological disorders. In reviewing the literature, Shearer and Gowing (2004) found the following pharmacotherapies had been used in response to psychostimulant use:

- Antidepressants;
- Dopamine agonists and antagonists;
- Disulfiram;
- Central nervous system stimulants;
- Modafinil;
- Vaccines;
- Calcium blockers; and
- Opioid agonists and antagonists.

Despite this diverse range of options, clinical studies of pharmacotherapies for ATS are sparse and controlled studies are rare. However, research is ongoing and a number of trials are currently being conducted to determine the utility of a range of medications. Vocci and Appel (2007) provide an overview of the approaches currently being used to develop medications for the treatment of methamphetamine dependence. This includes medications

that limit brain exposure to methamphetamine; modify the effects of methamphetamine at vesicular monoamine transporter-2 (VMAT-2); or act on dopaminergic, serotonergic, GABAergic, and/or glutamatergic neurological pathways that play a role in the reinforcing effects of methamphetamine. Vocci and Appel (2007) conclude that there is evidence to support the rationale that pharmacotherapies to decrease methamphetamine use or reduce cravings following cessation of use may be developed by:

...altering the pharmacokinetics and pharmacodynamics of methamphetamine or its effects on appetitive systems in the brain (p.96).

Following is a brief summary of some of this research with a focus on the main areas of investigation.

### Managing withdrawal

As already noted, there is limited evidence about pharmacotherapies to manage withdrawal. Given the presentation of acute toxicity (outlined above), symptoms related to mood and sleep require management. Antidepressants have been used to alleviate mood-related symptoms of withdrawal with mixed results. There is some suggestion that fluoxetine could decrease cravings in the short-term, and imipramine may increase duration of adherence to treatment in the medium-term, however, the evidence is limited (Shearer & Gowing, 2004). It has also been suggested that diazepam be used to treat anxiety and temazepam for insomnia (Dyer & Cruickshank, 2005). Finally, mirtazepine (medication that helps promote sleep and alleviate depression) has also been implicated in withdrawal management. Preliminary results from a joint investigation in Western Australia and NSW found no evidence that mirtazepine improved treatment retention, alleviated withdrawal symptoms, improved sleep or reduced methamphetamine use (Cruickshank et al., unpublished).

Modafinil, an agent used to treat narcolepsy, has also been suggested as having some utility in withdrawal management. The medication enhances wakefulness, vigilance and alertness, and may therefore alleviate withdrawal symptoms such as hypersomnia, poor concentration and low mood (Shearer & Gowing, 2004). A number of studies are underway, in Australia and overseas, to investigate the potential of this drug and others in managing ATS withdrawal. For example, DASSA is currently investigating the safety and efficacy of mirtazepine, modafinil and bupropion (antidepressant shown to be effective as a nicotine cessation aid) in the treatment of withdrawal symptoms following cessation of amphetamine use among dependent users. There are a number of other studies currently underway: the WA DAO and NSW Langton Centre are currently testing the efficacy of mirtazepine in the treatment of amphetamine withdrawal and narrative therapy as an adjunctive treatment; Turning Point in collaboration with DASWest, Hunter Area Health Service and University of Queensland are currently conducting a pilot randomised placebo controlled trial of Modafinil as an aid for methamphetamine withdrawal and entry into further treatment. Assessed outcomes include drug use, mental health, cognitive functioning and withdrawal symptomatology.

## Substitution therapy

Substitution therapy for ATS has most commonly involved prescribing central nervous system stimulants, in particular, dexamphetamine, especially to patients for whom other interventions have not been effective.

Substitution therapies aim to replace harmful drug use with safer modes of drug use in terms of dose, route of administration and adverse effects. Effective substitutes may allow patients to stabilise on doses that prevent withdrawal and craving and to reduce the harms associated with illicit drug use. (Shearer & Gowing, 2004, p.125).

The potential benefits of substitution therapy for amphetamine users were outlined by Fleming (1998) and include:

- Attracting and engaging amphetamine users into treatment, particularly those who would not otherwise seek out help;
- Engaging users in treatment provides a valuable opportunity to provide harm reduction information, health care interventions, and referral;
- Substitution acknowledges that there are problems associated with amphetamine use and thus, conveys messages about the potential harms of amphetamine use;
- By reducing amphetamine use through substitution, related harms are also reduced; and
- Potential short-term risks of prescribing substitutes may outweigh the potential long-term harms of continued illicit amphetamine use.

It has been suggested that substitution may be indicated for individuals who are dependent and for whom other attempts at abstinence have failed and maintenance is considered to be less risky than continued illicit use (Mattick & Darke 1995). However, it is noted that substitution therapy is not without risks, and may include the risk of relapse to psychotic episodes, risk of cardiovascular problems, risk of diversion of therapeutic doses and continued use of prescribed and illicit amphetamine (Shearer et al., 2002).

In the United Kingdom, dexamphetamine has been used to treat ATS dependence since the 1990s. Despite a number of relatively large clinical trials, there is little scientific evidence to support this treatment, but rather, self-report or case note studies (Bradbeer et al., 1998). White (2000) conducted a retrospective study of 220 amphetamine users receiving dexamphetamine prescriptions in the UK and found it had an immediate effect in reducing amphetamine use, but less impact on treatment retention (White, 2000). In this study, oral and intravenous amphetamine users had similar outcomes, although intravenous users made more overall gains in treatment.

The first randomised controlled trial of dexamphetamine as a substitute for methamphetamine dependence was conducted in Sydney (Shearer et al., 2001). This study compared 21 long-term dependent users receiving 60mg dexamphetamine daily to a control group of 20 similar users. Both groups received standard drug counselling and both were found to respond positively to intervention. Reductions were found in injecting behaviour, methamphetamine-positive urine samples and severity of dependence. The

only significant difference was in the uptake of counselling, which was greater in the dexamphetamine group. The most serious adverse consequence of dexamphetamine cited has been the potential development of psychotic symptoms, particularly for those who have experienced amphetamine-induced psychosis. Another potential risk is the diversion of prescribed amphetamine (Shearer et al., 2002). On the other hand, some clinical trials have reported that such risks do not necessarily eventuate in adverse outcomes (e.g., Carnwath et al., 2002). Further research is currently underway, in South Australia, which involves a randomised double blind placebo controlled trial of dexamphetamine as maintenance treatment for amphetamine dependence.

Aside from dexamphetamine, more recently both methylphenidate (e.g., Ritalin) and the antidepressant bupropion (e.g., Zyban) have been studied as potential amphetamine substitutes. Tiihonen and colleagues (2007) compared aripiprazole, a partial dopamine agonist, oral methylphenidate and a placebo among a sample of intravenous meth/amphetamine users. They reported that while aripiprazole was associated with significantly more amphetamine-positive urine samples, methylphenidate was associated with significantly fewer such samples. Bupropion is currently being trialled through several phases and has been shown to decrease subjective effects of methamphetamine and reduce cravings (Newton et al., 2006).

At present, evaluations suggest that ATS users find services offering substitution therapy attractive when offered in addition to advice and counselling, and results from international trials indicate that pharmacological treatment is most effective when used in conjunction with psychosocial intervention (Mattick & Darke, 1995). Thus, from both the perspective of the consumer and as indicated by the research, safe and effective medication potentially represents a valuable adjunct to psychosocial interventions that may enhance both participation and retention. However, as noted in the written submission from NDARC:

NDARC, in collaboration with St Vincents' Hospital and the Kirketon Road Centre, conducted the first randomised controlled trial of dexamphetamine as a substitute for methamphetamine dependence (Shearer et al., 2001). This trial found modest benefits from dexamphetamine treatment which needed to be confirmed in larger trials. ... Overall, existing evidence suggests that modest benefits from dexamphetamine substitution are outweighed by problems associated with this treatment, including diversion and side-effects from interactions with concurrent illicit drug use (Mattick & Darke, 1995).

### Antidepressants

Depression is commonly associated with ATS use, sometimes predating use, and also emerging as a consequence of use. As noted by Shearer and Gowing (2004):

Antidepressants have been investigated in the treatment of comorbid depression, depressive symptomatology associated with psychostimulant withdrawal, or for their dopamine agonist properties (p.121).

The range of trials, with various agents, has provided equivocal results. One interpretation of the data is that those with pre-existing affective disorders may be responsive to antidepressant treatment, whereas those with symptoms that emerge as a consequence

of ATS use may be less responsive. Some evidence exists to suggest this differential responsiveness (e.g., Donovan & Nunes, 1998). A final concern is the combined effect of using SSRIs (selective serotonin reuptake inhibitors) with people who are using ATS. Research suggests that the SSRI fluoxetine may potentiate acute toxic effects of MDMA in susceptible individuals (e.g., Hegadoren et al., 1999) and thus, more research is needed to investigate the interaction of SSRIs and MDMA and its potential contribution to serotonin toxicity. This all suggests the need for more research, particularly research identifying subgroups with whom antidepressants may be indicated and contraindicated.

Shearer and Gowing (2004) have observed that in fact the evidence for pharmacotherapies is generally limited, except for managing co-existing dependence on other drugs (such as using evidence-based pharmacotherapies for opioid dependence) or managing co-existing conditions (such as attention deficit hyperactivity disorder (ADHD) or affective disorders). These researchers provide a succinct and useful summary of the pharmacotherapy research:

...with the exception of pharmacotherapies targeted towards accurately and appropriately diagnosed comorbid conditions such as affective disorders, psychotic disorders, attention deficit disorders and opioid dependence, the use of pharmacotherapies for the promotion or maintenance of psychostimulant abstinence or the management of psychostimulant withdrawal continues to be experimental. The inherent risks of pharmacotherapy may suggest that the use of pharmacotherapeutic agents should be limited to users diagnosed with more severe dependence who experience the greatest burden of psychostimulant-related harms (Shearer & Gowing, 2004, p.130).

The potential role of pharmacotherapy in treatment for ATS abuse was repeatedly raised during the consultation process. There were many appeals for more research into substitution therapy in recognition that, at present, there is no strong evidence base for pharmacotherapy for ATS related problems. Furthermore, it was suggested that substitution therapy could make treatment more appealing, at least to some ATS users. However, the view that substitution therapy was problematic and only served to replace one form of dependence with another was also expressed. Thus, it was argued, use of substitution in the long term needs to be carefully considered on a case-by-case basis.

It was also recognised that pharmacotherapy may be more beneficial when used in conjunction with other forms of treatment, such as psychosocial interventions. In particular, the initial role of pharmacotherapy in crisis management was acknowledged, but that there was a need for this to be followed by helping clients to cope with the underlying psychosocial issues. Thus, the need for better relations and collaboration between services and treatment options was again emphasised.

Finally, pharmacotherapies were discussed in relation to the management of psychotic presentations, detoxification and withdrawal. In relation to the former, it was suggested that there was a need for improved protocols due to the risks associated with administering antipsychotics to those with methamphetamine-induced psychosis, as opposed to psychosis unrelated to drug use. The appropriateness of sedation regimes for those in heightened arousal due to a combination of amphetamine use and alcohol consumption was also questioned due to pre-existing levels of intoxication. Medically-assisted detoxification

through the use of antipsychotics and antidepressants was also raised. Issues of managing withdrawal were also seen as an issue for detention centre staff who were usually not medically trained.

## 5.7 Other interventions

### 12-Step Programs

Donovan and Wells (2007) performed a review of the available literature on the role of 12-step mutual support groups in the recovery process for consumers of methamphetamine. Few, if any, data were found on methamphetamine dependent clients and their use of these programs. However, the evidence with alcohol- and cocaine-dependent individuals was associated with improved outcomes. The researchers concluded that actively integrating 12-step programs into the treatment process may provide low- or no-cost options for methamphetamine consumers and increase the capacity for providing treatment.

### Residential treatment

There is some evidence that the residential treatment outcomes for ATS dependent clients is similar to other drug dependent groups (e.g., Hawke et al., 2000). However, it is a relatively expensive treatment option, and it may be appropriate to target it to particular patients. For example, Taylor and Gold (1990) suggested that residential treatment for people affected by ATS use may be appropriate when there is polydrug dependence; severe withdrawal; medical complications; psychiatric comorbidity; inadequate living conditions; and absence of social supports.

### Community based interventions

Community-based treatment programs in California, comprised of 12 residential and 20 out-patient programs, were recently evaluated in a longitudinal study examining treatment outcomes among 1,073 methamphetamine consumers (Hser et al., 2005). Data were collected at intake (baseline measures), and at 3 and 9 months following admission, with significant improvements found at 9-month follow-up in all key life areas (except for medical severity for males) as measured by the composite scores of the Addiction Severity Index. Gender differences were observed with women demonstrating greater improvements in family relationships and medical problems, but more likely to be unemployed, have childcare responsibilities and report more psychiatric symptoms.

## 5.8 Managing co-occurring mental health and amphetamine-type stimulant problems

Consideration of the co-occurrence of ATS use and mental health problems, as outlined in Chapter 3, has many implications for treatment. Differential diagnosis depends on the temporal and possible causal relationship between the issues and can be challenging for clinicians (Baker & Dawe, 2005). It is often easier to create the categories than it is to accurately identify the temporal relationship. ATS use may contribute to the development of mental health problems, or be a means of managing a pre-existing psychological difficulty,

or the two problems may have common underlying causes. Thus, people can experience both drug-induced and drug-independent psychological issues (Bakken, Landheim & Vaglum, 2003).

It is worth considering some of the co-existing mental health problems. Amphetamine users have higher rates of affective disorders such as anxiety and depression, psychosis, self-mutilation and self-harm, paranoia, hostility, agitation and aggression (Baker, Lee & Jenner 2004). To illustrate, Hall and colleagues (1996) interviewed a sample of 301 regular amphetamine users about their experiences of psychological symptoms prior to, and subsequent to, initiation of amphetamine use. Psychological morbidity was implicated in 44% of the sample according to scores on the General Health Questionnaire. The most commonly reported symptoms were depression (79%), anxiety (76%) and paranoia (52%), with all these symptoms increasing in prevalence after the onset of amphetamine use.

In their review of the literature, Baker and Dawe (2005) identified only a small number of studies that investigated co-occurring psychological problems among amphetamine users. The research to date suggested that anxiety disorders were more likely to follow the onset of amphetamine use than to precede it, but the evidence was less clear in regards to the temporal sequence of depressive symptoms. Again they found that depression and anxiety are the most common co-occurring psychological problems found in amphetamine users (Baker & Dawe, 2005). Determination as to whether these conditions are distinct from ATS use is complicated by the frequent presence of agitation and anxiety during amphetamine intoxication, and low mood, sleep difficulties and psychomotor retardation during amphetamine withdrawal (American Psychiatric Association, 2000). Dawe and McKetin (2004) suggested that diagnosis of amphetamine-induced anxiety disorder or amphetamine-induced affective disorder involves identification of the occurrence of symptoms following a substantial period of amphetamine use and remittance after 2 weeks.

Dyer and Cruickshank (2005) conducted a series of studies investigating the prevalence of depression and other psychological problems among patients receiving treatment for methamphetamine dependence. A study of individuals entering the inpatient treatment unit found that 46% had been previously diagnosed with an Axis I disorder, with depression diagnosed in 35% of patients. A second study administering the Beck Depression Inventory-II found that the average score for methamphetamine dependent patients was in the moderate range of depression and similar to that of psychiatric outpatients with clinical depression.

More recently, Gonsalves and colleagues (2007) collected data from a Midwestern dual diagnosis substance abuse facility in the United States to determine if predictors of methamphetamine use could be identified. The total sample of 281 admissions included 93 participants who met criteria for methamphetamine abuse or dependence and were only using methamphetamine. Of these participants, 18% had a diagnosed anxiety disorder, 12% a depressive disorder and 6.5% a psychotic disorder. Fourteen possible predictors were analysed and nine were found to be significant associated with primary methamphetamine use: gender, age, race, legal status, anxiety diagnosis, previous treatment, emotional abuse, level of care and program completion.

Given the prevalence of a range of co-occurring psychological problems, there is a need for clinical staff to be adequately trained and skilled to manage such presentations. The need

to develop the capacity of the workforce in this regard was noted in the written submission received from NDARC:

Both paranoia and other psychiatric conditions (e.g., depression, personality disorders) are common among dependent methamphetamine users seeking drug treatment. High levels of depression impede positive drug treatment outcomes, while agitation and paranoia can impede treatment progress. Continued training of health workers in the accurate assessment and diagnosis of such comorbidity among methamphetamine users attending treatment is essential. Likewise, the provision of an integrated model of care, addressing mental health and substance use issues, is critical to ensure adequate care for dependent methamphetamine users.

A number of researchers have found that integrating treatment for mental health and drug problems has better outcomes than more disaggregated approaches (e.g., see Barrowclough et al., 2001). In a recent review McKetin (2004) suggested the principles described in Teesson and Burns (2001) be used to integrate treatment provision. These included the need for treatment services to respond to diverse co-morbid conditions, the need to build more effective strategies to engage and retain people in treatment, and the need to adequately resource services (mental health and drug specialist) to work effectively in case management, referral, liaison and collaboration. However, McKetin (2004) also noted:

...there is a paucity of research on the effectiveness of diagnosing and treating comorbid conditions among psychostimulant users and ... Consequently it is not possible to recommend any specific interventions for comorbid conditions at this point, although a general recommendation would be to encourage diagnosis and integrated treatment of comorbid conditions among psychostimulant users (p.168).

Largely due to the paucity of research, Baker and Dawe (2005) observed that although integrated treatment is the treatment of choice in people with severe psychiatric illness, among people with anxiety and depression and co-occurring alcohol and other drug problems, the situation is less clear. Given the high levels of comorbidity indicated in the research, a collaborative and integrated approach between alcohol and other drug services and mental health services may be implicated as best practice for treatment of ATS use and related problems. The specifics of such treatment may be less clear, other than to use evidence based treatments for each kind of problem.

The Victorian Government recently released the Dual Diagnosis: Key Directions and Priorities for Service Development. This policy is designed to improve Alcohol and Other Drug (AOD) and Mental Health Services recognition of and effective responses to co-occurring substance use and mental health disorders. The policy is based on outcomes from the Dual Diagnosis Forum that brought together specialist mental health and drug and alcohol service providers and stakeholders, consumers and carers. The policy incorporates the following key issues: dual diagnosis and assessment is a 'core business' within specialist mental health and drug and alcohol services; relationships need to be systematically developed within and across sectors to improve outcomes; and, a 'no wrong door' service system be developed for consumers with co-occurring disorders.

Projects currently underway in Australia to address issues of comorbidity include:

- Trials of stepped care approach and computer-based CBT for ATS users with co-morbid depression currently being conducted in Newcastle;
- NSW Health has planned new initiatives that include funding to address issues of comorbidity. It aims for better integration of mental health services with drug and alcohol services and trialling new interventions, including a trial of methamphetamine treatments;
- Queensland Health's Mental Health Services has funded 13 new dual diagnosis positions to increase the capacity of both mental health and alcohol and drug services to respond to people with dual diagnosis; and
- A trial of an integrated intervention for methamphetamine users with symptoms of depression is being conducted by researchers at Turning Point, University of Newcastle, National Drug Research Institute (NDRI) and NDARC.

## 5.9 Workforce development

One issue that was consistently raised during consultations was the need for education and training for workers, and improved integration of client care. It was largely agreed that staff need to be up-skilled in management protocols, including managing acute presentations and providing ongoing care. Turnover of staff due to burnout and safety concerns was raised, as was concerns about attitudes towards ATS users on the part of staff. It was suggested that some staff have negative attitudes to this client group and are consequently judgmental. Furthermore, clients may be seen by several services in different contexts with minimal communication between them. This also impacts on accessing services as consumers are reluctant to have to attend a variety of services. Suggestions included developing Memoranda of Understanding (MOUs), local liaison teams across services providing care from acute inpatient to outpatient, training specialist AOD mental health workers, establishing dual diagnosis units, and inhabiting a common working environment.

The need for training and collaboration was particularly noted in relation to the alcohol and drug sector and mental health. It was suggested that the knowledge of many working in the health and support services is deficient, making it difficult for them to identify the nature of presenting conditions, and whether it is a mental health problem or a drug induced condition. One respondent stated that there was a need for:

... a better working relationship between mental health and drug and alcohol services. Dual diagnosis needs to be taken apart and re-addressed – too many times each 'side' feel that the cause of the problem is the other. No one can absolutely state categorically whether the drugs and alcohol cause the mental health issues or the mental health issues are exacerbated by the drug and alcohol use. These teams should work together, not apart – a diagnosis is not the main issue – making the client safe and working towards their future is the main importance.

It was also suggested that links are weak because services use different practice guidelines and models of care.

A variety of guidelines to manage ATS problems have been developed. Among these are clinical treatment guidelines, developed by Turning Point specifically for methamphetamine dependence. These guidelines, which include a focus on management of acute presentations and interventions for methamphetamine use and dependence, are similarly based on a stepped care approach, defined as:

Stepped care involves the provision of a series of interventions, from the least to the most intensive, with each incremental step made available on the basis of the client's response to the previous one (Lee et al., 2007, p.13).

The manual outlines a step-by-step approach to managing methamphetamine-related presentations, illustrated with use of a decision tree (see Figure 1, p. 16 of the manual). Guidelines are provided for managing acute toxicity, managing aggressive or agitated behaviour, managing acute psychotic symptoms, various assessments (e.g., dependence, co-morbid psychological problems), managing withdrawal, harm reduction approaches, brief interventions, and longer interventions based on CBT.

However, as noted in their submission, Turning Point observed that guideline development is not sufficient:

Multiple guidelines are now available for frontline workers and health workers. Dissemination is a major impediment to their uptake and significant funding is required to translate these very useful guidelines into practice.

The potential role of psychologists was also discussed, particularly in combination with GP care. One suggestion was to adopt a case management approach between GPs and psychologists in order to provide both pharmacological and psychosocial support and assistance. However, as noted in the submission from the Australian Psychological Society (APS), there will be a need to accompany such approaches with workforce development:

Psychologists and other practitioners working with those using or affected by ATS need up-skilling to improve their understanding of new forms of amphetamines, in addition to information about the symptoms and problems associated with ATS.

In addition to improving training within and coordination across different health services (e.g., alcohol and drug workers and mental health services), this was also needed across sectors, such as between health services and criminal justice. For example, the written submission from the WA Department of the Attorney General stated:

There is a need for further education of judicial officers, lawyers, police, other prosecuting agencies and community corrections officers to increase their understanding of ATS and best practice when dealing with users. Interventions and effective cross-agency working relationships would be improved if education were extended to better ensure that training for treatment and support service providers includes improved understanding of the total case processing requirements of courts and other justice agencies within the criminal justice system.

The APS, and other submissions, particularly emphasized the need for more coordinated and collaborative responses among services. This included improving pathways between services, establishing effective referral systems and a unified case management approach. In their submission, Headspace not only emphasized the need to ensure a coordinated approach, but noted the need to facilitate multiple entry points into care:

the strategy should emphasise an integrated and coordinated service response between mental health services, AOD services, general welfare and youth services and dual diagnosis services. There should be '*no wrong door*' for ATS users who are seeking information, support and treatment.

## 5.10 Summary

Treatment for ATS use and associated problems is impeded by relatively low rates of access by ATS users and tenuous links with services. Research suggests that those least likely to receive treatment are females, persons born outside Australia and those in full-time employment. Furthermore, poor treatment retention is associated with frequent use, injecting and use during treatment. Nevertheless, recent Australian national data suggest that approximately 11% of those seeking treatment for drug use reported amphetamine as the principal drug of concern. Of this group, the most common form of treatment was counselling.

The first point of contact for many ATS users is with frontline services, often due to intoxication or related problems including violence and psychotic behaviours. The high burden on frontline services posed by ATS use, particularly methamphetamine, is largely due to the nature of the presentations rather than the actual numbers of ATS-related presentations. As a result, national guidelines have been developed for police, ambulance staff, emergency departments and general practitioners in managing psychostimulant users, including pharmacological management of toxicity. The extent of dissemination and utilisation of these guidelines remains unclear.

A related issue is that of withdrawal management for ATS. Current research suggests the amphetamine withdrawal syndrome is comprised of hyperarousal symptoms, reversed vegetative symptoms and anxiety-related symptoms. Symptoms of depression have also been found during the first several days of withdrawal. At present there appears to be a lack of clear protocols for appropriate withdrawal management for dependent meth/amphetamine users. Pharmacotherapies currently being trialled include various antidepressants, mirtazepine and modafinil.

Several psychosocial interventions have been used in treatment for ATS users. These include brief interventions, inpatient programs, therapeutic communities, 12-step programs, peer interventions, contingency management, behavioural strategies, cognitive-behavioural interventions, multimodal packages (such as the Matrix Model used in the United States) and non-traditional methods such as acupuncture. Research to date suggests that cognitive behavioural therapy (CBT) applied in a stepped care approach is the treatment of best practice for ATS use. CBT is typically comprised of motivational interviewing, instruction in cognitive-behavioural coping strategies and relapse prevention. However, there is a limited evidence base and consideration of what is best practice may be confirmed or change

as new evidence emerges. New psychological approaches to treatment currently being investigated in Australia for ATS use include mindfulness therapy, narrative therapy and acceptance and commitment therapy.

Pharmacotherapy has also been used in treatment of ATS use. In addition to its role in withdrawal management, it has also been investigated as substitution therapy. This typically involves the use of prescribed dexamphetamine, particularly for those users for which other interventions have not been effective. More recently, methylphenidate and bupropion have been studied as potential amphetamine substitutes. Although there may be risks associated with substitution therapy, it is viewed by users as an attractive incentive into treatment and clinical trials show it may be effective when used in conjunction with psychosocial intervention. There may also be some adverse outcomes that compromise the value of substitution therapies, at least for some patients. Unfortunately, the evidence base is limited.

An issue to consider in treatment for ATS use is co-occurring mental health problems. Co-morbidity of alcohol and drug use and psychological difficulties is common, and ATS use is no exception. While the research is limited, depression, anxiety and psychosis have all been identified as associated with ATS use. Given this, an integrated approach to treatment that involves coordination and collaboration across sectors is indicated. In addition, health professionals need education, training and supervision specific to the issues of ATS use. The research and opinion at consultations indicates that dissemination of existing guidelines and development of further professional resources is needed.

## Chapter 6: Law Enforcement

Australia is a signatory to three United Nations major international drug control treaties, their crime conventions and related resolutions, which are mutually supportive and complementary. As stated in the World Drug Report (United Nations Office on Drugs and Crime, 2007), an important purpose of the first two treaties is to codify internationally applicable control measures in order to ensure the availability of narcotic drugs and psychotropic substances for medical and scientific purposes, and to prevent their diversion into illicit channels. They also include general provisions on illicit trafficking and drug abuse.

The Single Convention on Narcotic Drugs, 1953 aims to combat drug abuse by coordinated international action. There are two forms of intervention and control that work together. First, it seeks to limit the possession, use, trade, distribution, import, export, manufacture and production of drugs exclusively to medical and scientific purposes. Second, it combats drug trafficking through international cooperation to deter and discourage drug traffickers.

The Convention on Psychotropic Substances 1971 establishes an international control system for psychotropic substances. It responded to the diversification and expansion of the spectrum of drugs of abuse and introduced controls over a number of synthetic drugs according to their abuse potential on the one hand and their therapeutic value on the other.

The Convention against the Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988 provides comprehensive measures against drug trafficking, including provisions against money laundering and the diversion of precursor chemicals. It provides for international cooperation through, for example, extradition of drug traffickers, controlled deliveries and transfer of proceedings.

### 6.1 International markets

The UNODC reported that after years of substantial increases in the 1990s, the markets for amphetamine-type stimulants (ATS) seem to be stabilising, reflecting improved international law enforcement cooperation and precursor control. The quantities of precursors and the number of illicit laboratories seized increased in accordance with intensification of enforcement efforts. However, end-product seizures declined and the number of ATS users remained roughly stable.

In discussing trends in world drug markets, the World Drug Report (United Nations Office on Drugs and Crime, 2007) noted that methamphetamine manufacture and trafficking has spread beyond the traditional markets of Asia and North America (e.g., to South Africa), though remains limited in Europe. An even stronger geographical spread has been observed with regard to MDMA production and trafficking. While there seem to have been some declines in the 'traditional' manufacturing locations of Western Europe (notably the Netherlands), MDMA production is spreading to other parts of the world, including North America, Oceania and South-East Asia.

Crystal methamphetamine is the most likely form of methamphetamine to be imported into Australia, with large shipments of crystal methamphetamine first detected at the Australian

border in 2000 (McKetin et al., 2005). Most shipments originate from China or, to a lesser extent, other countries in the Asia Pacific region and are usually concealed in cargo bound for the East Coast (McKetin et al., 2005). Recent increases in imports of methamphetamine produced in South-East Asia, notably in China and the Philippines, into Australia have offset some of the decline in domestic production (Australian Crime Commission, 2006).

During consultations, the influence of countries in South-East Asia, particularly India, on trafficking was noted. Some participants highlighted the continued importation of methamphetamine and their precursors from Asia, which needs to be addressed. Similarly, a 10% increase in the importation of licit pharmaceuticals in recent times was noted and the diversion of some for illicit means. The ease with which methamphetamine can be manufactured is a measure of its availability and low cost, as noted in the written submission from the National Drug and Alcohol Research Centre (NDARC):

The supply of methamphetamine and its precursor chemicals is economically lucrative, and inconsistencies in precursor control legislation across the Asia Pacific region hamper efforts to prevent the diversion of precursor chemicals to illicit drug manufacture. There are also few limitations on where the drug can be manufactured, which has led to methamphetamine supply being more dynamic and less predictable than the supply of crop-based illicit drugs, such as heroin and cocaine.

In discussing trends in amphetamine markets, the World Drug Report noted a decline:

In 2005, the number of Asian countries reporting an increase in amphetamines use declined to 15, while the number of countries reporting stable or declining amphetamines use increased to 16. A year earlier, 20 Asian countries had reported an increase and only 12 countries saw a stable or declining trend. Once the reported trends are weighted by the amphetamines using population, the net result shows a (marginal) decline. This stabilisation followed years of uninterrupted growth over the last decade in the Asia region. Increases in amphetamines use are mainly reported by countries of western and southern Asia. In contrast, countries of East and South-East Asia, which account for the bulk of all amphetamines use in Asia, report a stabilisation or even a marginal decline. Following strong increases in the 1970s, early 1980s and late 1990s, all data for Japan, Asia's most lucrative methamphetamine market, suggest that methamphetamine abuse stabilised or even declined slightly in recent years. The life-time prevalence rate of methamphetamine was reported to have amounted to 0.4% of the population aged 15 and above in 2003, but fell to 0.3% by 2005 (United Nations Office on Drugs and Crime, 2007, p.157).

## 6.2 Domestic methamphetamine production

It is estimated that 90% of ATS in the Australian illicit drug market is produced in Australia in clandestine laboratories, while the other 10% is imported (Schloenhardt, 2007). Predominantly, domestic production is focused on ATS of lower purity forms, such as base, and reports suggest that high purity crystal methamphetamine production takes place in Asia or elsewhere, and is subsequently imported into Australia (Schloenhardt, 2007). A significant proportion of ATS production occurs in small clandestine laboratories (clan-labs) located in private homes, car-boots and hotel rooms, which make detection

in manufacturing and trade difficult for law enforcement agencies, particularly in rural areas (Schloenhardt, 2007). Domestic seizures reflect that production is smaller in scale, unlike, for example, in the United States, where supply is met by larger 'super-labs' (Schloenhardt, 2007).

Modes of production detected in Australia include:

- hypophosphorous method – use of hypophosphorous acid and iodine;
- red phosphorous method – use of hydriodic acid and red phosphorous;
- 'nazi' method – using lithium or sodium with anhydrous ammonia; and
- P2P or Leuckart method – using phenylacetone or benzyl methyl ketone with formic acid or aluminium amalgam.

According to the 2005-06 Illicit Drug Data Report (IDDR), the number of ATS laboratories detected in Australia has steadily increased from 10 in 1990 to 390 in 2005-06 (Australian Crime Commission, 2007) (see Table 6.1). However, since 2004 the number of dismantled laboratories appears to be stabilising. As the majority of clandestine laboratories had been producing meth/amphetamine using the hypo-phosphorous acid method (which requires pseudoephedrine as a precursor), this stabilisation may be partly due to the restrictions placed on the purchase of pseudoephedrine-based pharmaceutical products in early 2006 through Project STOP and other initiatives, such as restrictions on scheduling.

Methamphetamine production in Australia takes place in practically all states with further evidence of the impact of Project STOP evident from detections in Queensland. Queensland had the highest clandestine laboratory figures since 1997–98, however a significant decrease in the number of laboratories detected in 2005–06 was reported in this state, which may be attributed to the introduction of Project STOP in early 2006 (Australian Crime Commission, 2006). The IDDR reported a 42% decrease in clandestine laboratory detections in the Northern Territory in 2005–06, while there were significant increases in the number of detections in WA and Victoria (Australian Crime Commission, 2007). The submission from NDARC noted that there have been reports by consumers of domestic production of crystal methamphetamine. While evidence of domestic production of crystal methamphetamine is not documented in Australian Crime Commission (ACC) reports, there is considerable police concern at both federal level and state level that several sophisticated laboratories already discovered, were capable of making crystal methamphetamine. Therefore, concurrent sustained efforts to control domestic diversion of precursor chemicals and manufacture is needed to disrupt high levels of domestic production that occur within Australia.

Table 6.1: Number of clandestine laboratory detections by state and territory, 96/97-05/06

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
1996-97 <sup>a</sup>	–	–	–	–	–	–	–	–	58
1997-98	19	9	55	7	3	2	0	0	95
1998-99	20	4	83	12	8	0	2	2	131
1999-2000	20	18	79	14	17	0	1	1	150
2000-01	42	32	77	24	22	1	3	0	201
2001-02	32	24	138	32	22	3	1	0	252
2002-03	47	19	171	34	36	2	3	2	314
2003-04	61	20	189	48	33	1	6	0	358
2004-05	45	31	209	25 <sup>b</sup>	44	3	21	3	381
2005-06	55	47	161	50	58	5	12	2	390

a. Jurisdictional breakdown unavailable for 1996-97.

Source: ACC, Illicit Drug Data Report 2005-06, Canberra: ACC

## 6.3 Precursor regulation

### National initiatives

The nature of the synthetic illicit drug trade is such that law enforcement and policing strategies are becoming increasingly focused on precursor substances and equipment; not just the end products of the drugs themselves. In many countries, this has taken the form of increasingly strict precursor regulations including:

- Criminalising the supply of precursor chemicals for the use of ATS production;
- Limiting the amount of licit drugs allowed to be purchased in pharmacies and over-the-counter;
- Restricting the international and intra-national movement of large quantities of precursor chemicals; and
- Attempting to monitor the movement and supply of drugs that can be utilised in the production of ATS (Cherney et al., 2006).

The National Strategy to Prevent the Diversion of Precursor Chemicals into Illicit Drug Manufacture (the “National Precursor Strategy”) provides the strategic framework for the initiatives undertaken by the National Working Group on the Prevention of the Diversion of Precursor Chemicals into Illicit Drug Manufacture (the “National Precursor Working Group”). Comprised of representatives of state and territory, health agencies, forensic services and the private sector this forum is a key mechanism for formulating effective cross-sector, nationally coordinated and consistent responses to precursor diversion (see Table 6.2).

Key projects include:

- The rescheduling of pseudoephedrine;
- National Clandestine Laboratory Database;
- Community pharmacy sector awareness raising about ‘pseudo-running’;
- The national roll-out of Project STOP;
- National framework for the control of precursor chemicals;
- National framework for the remediation of clandestine laboratory sites; and
- Training for Customs officers and forensic specialists.

The National Chemical Diversion Congress provides a national forum for representatives from key sectors—police health, forensics, industry and policy—to discuss all matters relevant to controlling the diversion of precursor chemicals and responding to domestic illicit drug manufacture.

Many of the consultations made reference to the importance of precursor control and the various strategies required. For example, it was stated that intelligence was improved by more dedicated forensic analysis of drugs and a wider application of the Drug Use Monitoring in Australia (DUMA) program. Further, the National Clandestine Laboratory Database was viewed as a good first step, provided the information obtained was timely and useful. The written submission from NDARC noted that:

Concurrent sustained efforts to control domestic diversion of precursor chemicals and manufacture is also needed, because of the high levels of domestic production that occur within Australia.

### Legislative responses

Typically, the chemicals sought after to produce ATS are pseudoephedrine and ephedrine (Schloenhardt, 2007), which have a number of legitimate uses, and are commonly available from pharmacies and supermarkets. In Australia, such precursor chemicals are regulated by drug laws in both state and federal jurisdictions (Schloenhardt, 2007). The submission from NDARC commented that:

Improved capacity to regulate precursor chemicals and control ATS supply in the Asia Pacific region is needed to reduce the supply of high purity methamphetamine in Australia.

In 1998, the Model Criminal Code Committee of the Standing Committee of Attorney-Generals published its report on model serious drug offences. The report arose from concerns that within a mobile society like Australia, organised crime involving illicit drugs transcends state and national boundaries and people may be treated differently in different jurisdictions. Therefore:

there is a persuasive case for uniformity in the definition of serious offences such as drug trafficking (p.ii).

**Table 6.2: Examples of domestic law enforcement initiatives to address the supply of precursors to the illegal market**

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Formal arrangements
National network of Chemical Diversion Desks, working in close partnership with industry
A chemical industry Code of Practice for Supply Diversion into Illicit Drug Manufacture
The use of ACC coercive powers to gather information on trends and threats
Workforce development
Training of specialist investigators to enable effective responses to suspicious precursor chemical-related activity and clandestine laboratories
Awareness raising for pharmacies about diversion methods and preventative measures
Awareness raising for prosecutors and judiciary on the serious nature of precursor diversion and ATS production
Enhanced forensic capabilities and training
Development of a national remediation framework for clandestine laboratories
Intelligence sharing and targeted interventions
The continuation and cultivation of local and national partnerships in joint police operations, including sharing intelligence and resources
Project STOP
Enhanced intelligence collections through the ACC National Clandestine Laboratory Database
Enhancements in the collection and dissemination of information on industrial chemical importation and usage
Analysis of industry controls for chemicals and equipment to respond to the increased risk of thefts and fraud
Legislative responses
The development of model legislation as a step towards national consistency for drug types and amounts
Rescheduling of pseudoephedrine based cold and flu medications to restrict availability to 'pseudo runners'
Strengthening of State and Territory laws surrounding precursor chemicals and equipment
The introduction of laws in some jurisdictions prohibiting the possession of a tablet press without lawful excuse
Community activity
Awareness raising within the community of the signs of clandestine laboratory activities

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Source: Ministerial Council on Drug Strategy Joint Communiqué 16th May 2007 'NATIONAL LEADERSHIP FORUM ON ICE – COMPENDIUM OF JURISDICTIONAL ACHIEVEMENTS' <http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/publishing.nsf/Content/mcnds-16may07-communiqu>

Several jurisdictions have since enacted legislation to implement the model offences: Tasmania (2001), Victoria (2001), ACT (2004), South Australia (2005), and the Commonwealth (2005) (see Table 6.3 for examples). There are differences between jurisdictions in implementing legislation. NSW made some legislative changes based on the model laws, but has not fully enacted the model offences. In Queensland, unlike some other states, law enforcement personnel are unable to carry out telephone intercepts and other forms of detection due to the legislative inadequacy for precursor chemicals under the

Drug Misuse Act 1986 (Crime and Misconduct Commission, 2006). Similarly, offences such as the intention to manufacture amphetamine have been enacted in Queensland, NSW and Victoria, and are yet to be introduced in other states.

Although the content of the legislation differs in each jurisdiction, the central themes are the same. Penalties are higher for those found to be dealing in drugs than those possessing them for their own use, and people convicted of trafficking large amounts of drugs are liable for a greater penalty than lower level dealers. Drug trafficking is a serious offence and conviction may result in life imprisonment. Most jurisdictions have enacted legislation allowing the seizure and forfeiture of assets derived from drug dealing.

**Table 6.3: Examples of legislative changes in different jurisdictions**

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#### NSW

In 2006, enacted a number of amendments to drug misuse and trafficking laws including listing chemicals that are precursors to the drug GHB as prohibited drugs and creating a number of new offences including:

- sale, commercial supply or display of crystal methamphetamine pipes in a shop for a commercial purpose;
- exposing a child to the manufacturing or production of a prohibited drug or to chemicals stored for that purpose; and.
- procuring a child to supply or take part in the supply of a prohibited drug.

In 2006, introduced separate legislation to create a new offence of indoor, hydroponic cultivation of cannabis plants for a commercial purpose. These new laws also contain supplementary offences of cultivation in the presence of children.

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#### QLD

In 2006, enacted laws to create a new offence of possession of prescribed substances or items for the production of a dangerous drug, which has a maximum penalty of 15 years imprisonment. This offence is aimed at “the developing market for persons who supply illicit methamphetamine manufacturers with chemicals and apparatus but who do not personally engage in the manufacture of the final dangerous drug. The laws also create a new offence of possessing a prescribed combination of items for the production of a dangerous drug, which has a maximum penalty of 25 years imprisonment.

This means that when a clan lab is located and the prescribed combination of items is identified, the remainder of items seized will not need to be forensically tested as the prosecution will not be seeking to prove that production has occurred. The laws also introduced evidentiary provisions to remove the requirement for forensic testing of sealed pharmaceuticals and alleged clan equipment unless challenged by the defence. Other laws enacted in 2006 allow police to enter pharmacies for the purpose of monitoring excessive sales of chemicals that are used to make amphetamines such as base.

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#### WA

In 2003, introduced laws that place controls on suppliers of chemicals and apparatus that can be used in the manufacture of illicit drugs.<sup>137</sup>

In 2003, also enacted laws to allow police to issue an infringement notice to a person who is reasonably believed to be cultivating, possessing or using cannabis within the specified limits. Outside these limits, offenders are subject to criminal prosecution. Persons issued with an infringement notice have the option of paying the penalty, attending a cannabis education session or having the matter heard in court. This reform in Western Australia was advocated by the Community Drug Summit held in August 2001. South Australia introduced a similar scheme in 1986. NSW does not have an infringement notice scheme but in 2000 it introduced the Cannabis Cautioning Scheme to allow police to issue cautions in relation to minor cannabis offences.<sup>139</sup>

In 2004, enacted laws to make it an offence for a declared drug trafficker to consort with another person whom the police have warned them is also a declared drug trafficker. The maximum penalty is 2 years imprisonment. In 2005, laws were amended to prohibit the diversion of precursor chemicals and equipment for use in the illegal manufacture of methamphetamine. The use, sale and supply of drug use paraphernalia such as ‘ice pipes’ were banned.

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### Tasmania

In 2004, strengthened the presumption that possession of a trafficable quantity of a controlled substance is evidence of an intention to sell or traffic the substance. Under the new laws, the presumption of an intent to sell or traffic can only be displaced if the accused proves that he or she had no intention to sell or traffic. The Model Criminal Code Officer Committee had recommended the model serious drug offence provisions be changed in this way and the Standing Committee of Attorneys-General adopted this proposal.

In 2005, enacted further reforms including allowing a trafficable quantity of drugs to be made up of a combination of different types of drugs.<sup>143</sup>

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Source: Ministerial Council on Drug Strategy Joint Communiqué 16th May 2007 'NATIONAL LEADERSHIP FORUM ON ICE – COMPENDIUM OF JURISDICTIONAL ACHIEVEMENTS' <http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/publishing.nsf/Content/mcdfs-16may07-communication>

A number of consultations highlighted the need for continued legislative reform.

Comments included:

- Ensuring national legislation is implemented in respect to remediation of clandestine drug laboratory sites;
- Ensuring offence and penalty provisions remain appropriate in light of emerging ATS trends and threats, including appropriate coverage of possession and use of precursor chemicals and equipment for the purpose of manufacturing ATS; exposure of children to clandestine laboratories; use of children for trafficking ATS; and sale of ATS to children;
- Reviewing the regulations surrounding the sale of devices used for ATS consumption;
- Supporting the work of the National Scheduling Committee; and
- Ensuring law enforcement has appropriate powers to respond to the ongoing and evolving ATS threat.

Considerable concern was expressed at the consultations about the disjunction in legislation across the country and the need to establish consistent, coherent and timely legislation which anticipates emerging issues such as pill presses (used in illicit production) and roadside drug testing. It was noted that different legislative regimes in different states have resulted in uneven response to the principles of the Model Criminal Code and there was a need for all states to adopt the ATS schedules regarding precursors.

Many of the consultations highlighted the unintended consequences of legislation. For example, it was suggested that the banning of 'ice' pipes may have the effect of diverting users to injecting as the route of administration. This has significant ramification for health outcomes given the prevalence of smoking and the potential number who may divert to injecting.

In addition, recommendations from the consultations suggested a need to recognise that creating an enabling environment can be confounded by the law. For example, in the case of injecting users, the application of the law in different jurisdictions is mirrored in the behaviour of police in dealing with drug users and dealers. In some jurisdictions police might not actively pursue users whose behaviour was under control. In other jurisdictions these people could expect to be pursued. Similarly, experience with the criminal justice system can mean loss of employment and other self defining elements in people's lives, which are critical to rehabilitation and non-offending. One submission noted that:

Law enforcement agencies need to work closely with harm reduction agencies and service providers to ensure that law enforcement practices do not have unintended, harmful effects.

## 6.4 Australian law enforcement

Australian law enforcement responses to drugs, including ATS, are guided by the National Drug Strategy (NDS), which emphasises reductions in supply, demand and harm. The 2005-06 IDDR reported that seizures of illicit drugs at the Australian border were lower than in previous years (Australian Crime Commission, 2007).

Domestic seizures of illicit drugs by the AFP also decreased during 2005-06. During this period, AFP and Customs operations directly prevented over one tonne of illicit drugs reaching Australian streets.

It is possible that the focus of the AFP and Customs on pre-emptive offshore interdictions resulted in fewer seizures within Australia. Against this, critics of supply reduction argue that crystal methamphetamine and availability of illicit drugs do not appear to have been affected by law enforcement activity. There are however no authoritative or systematic data collections available to support this one way or the other. The 2005-06 IDDR proposed that:

- Seizures of MDMA in 2005-06 suggest that criminal groups are attempting to introduce high-quality and high-volume laboratory production of MDMA in Australia. This has been evidenced by the importation of MDMA precursors and the importation of the relevant manufacturing expertise; and
- The ability of criminal groups to react flexibly and shift their areas of operation provides ongoing challenges for law enforcement agencies. For example, following record MDMA and precursor seizures in Australia in early 2005, criminal syndicates appear to have diverted their attention away from Australia and towards Indonesia, which was highlighted by the detection of an ATS and MDMA laboratory operating in Indonesia in November 2005 (Australian Crime Commission, 2007).

Crystal methamphetamine represents more than 60% of the total weight of ATS detected at the border in the past five years (Australian Crime Commission, 2007). The majority of recent crystal methamphetamine detections have been scatter importations, that is, multiple small importations organised by a single individual/group, generally undertaken with the expectation that individual detections will not attract law enforcement attention (Australian Crime Commission, 2007). Customs is aware of organised syndicates using this methodology, but the extent of links to major organised syndicates has not been determined.

The AFP, Customs and the ACC continue to collaborate closely in targeting and responding to instances of illicit ATS and precursor importation. For example, the AFP, Customs and the ACC have recently launched a collaborative project to trial a concept for the development of targets for operational attention, known as the Joint Target Generation Team. The early taskings for the project related to the threat posed by illicit importations of precursor chemicals from China.

Recommendations from the consultations and submissions included a need to strengthen strategic intelligence and to improve national controls so authorities can gain knowledge about who is involved in the illicit trade. It was also suggested that there needs to be improved intelligence regarding the manufacturing and distribution believed by consumers to be locally produced, but not confirmed by law enforcement agencies.

## 6.5 Local drug markets

Because drug markets are where 'supply and demand converge', intervention strategies need to target both as reducing the supply of a drug to local markets can have a dramatic effect on both criminal justice and health outcomes (Weatherburn et al., 2003). Infiltrating these markets requires knowledge of how the market operates. The 2006 DUMA report suggested that, in clandestine illicit drug markets, it can be quite difficult for buyers and sellers to become connected and effort is required even for experienced buyers to assess the options available in the market (Mouzos et al., 2007). In most markets, the buyer and seller make a significant time investment in the exchange relationship (Wilkins et al., 2004). Nevertheless, a significant proportion of police detainees and injecting drug users (IDU) are active in the methamphetamine market. Furthermore, as indicated by the 2004 National Drug Strategy Household Survey (NDSHS), this market is also available to the general population as approximately 110,000 persons aged 14 years and older reported accessing the methamphetamine market within the last week (Australian Institute of Health and Welfare, 2005a).

There are differences in the ways consumers access illegal drug markets for different drug types (see Table 6.4). The 2004 NDSHS reported that both meth/amphetamine and ecstasy were more commonly obtained from a friend (70%) than a dealer (23%) (Australian Institute of Health and Welfare, 2005a). In contrast, the most common method among police detainees was contacting a dealer for methamphetamine by calling on a mobile phone (31%), or visiting the dealer's residence (26%) (Mouzos et al., 2007). The 2006 DUMA report found that, irrespective of the drug purchased, detainees were more likely to have purchased their drugs from a regular source, although a higher proportion of detainees purchased ecstasy from a new source compared to other drugs (Mouzos et al., 2007). When methamphetamine is bought within the detainee's own suburb, the supplier is likely to be a regular supplier. They are also more likely to report sourcing from a house or flat for the drug in contrast to heroin which is more likely to be sourced on the street (Mouzos et al., 2007). However, detainees who had used a new source at their last time of purchasing methamphetamine were more likely to have purchased the drug from the street (Mouzos et al., 2007). A major study of the market in Sydney also found that purchasing from street dealers was uncommon among a sample of regular methamphetamine users (McKetin et al., 2005).

Among the national sample for the 2006 Illicit Drug Reporting System (IDRS), all forms of methamphetamine were most commonly purchased from 'friends' and 'known dealers', and the most common locations of purchase were 'agreed public location', 'friend's home' and 'dealer's home' (O'Brien et al., 2007). This was replicated in the 2006 Ecstasy and Related Drugs Reporting System (EDRS), with the exception of 'agreed public location' as a common location of purchase (Dunn et al., 2007).

Table 6.4: Key drug market characteristics for those who paid cash for drugs in the past 30 days, adult police detainees (%)

	Cannabis	Heroin	Methamphetamine	Cocaine	Ecstasy
Method of contacting dealer					
Mobile phone	20	42	31	36	33
Phone	12	24	20	22	14
Visit a house or flat	37	11	26	12	14
Approach them in public	14	14	10	11	19
Location of last buy					
In own suburb	48	33	34	32	32
Place of purchase					
House or flat	60	26	53	41	42
Street	22	55	29	26	28
Home delivery	11	11	10	22	14
Source					
Regular source	57	65	57	55	44
Occasional source	26	18	25	30	27
New source	17	17	18	15	29

a: For those detainees who provided urine only

Note: Excludes some categories, and therefore does not sum to 100

Source: AIC, DUMA collection 2006 [computer file]

Given the usual method of purchase from known sources in private or agreed locations, tackling street level markets will have limited impact. However, if users seeking out new sources do so in street markets, then strategies to reduce availability are important. Furthermore, research has shown that the perceived risk of law enforcement is a major factor affecting which markets users will access, how they use and entry into treatment (Weatherburn & Lind, 1999). In addition, research shows delaying the onset of initiation (and by implication access to markets for first time users) reduces the risks of long term health and criminal justice harms. Concern over the level of policing local markets was raised in the consultations:

Despite recent developments and concerns about illicit drug trafficking States and Territories have scaled down specialist units to assist with the detection and dismantling of illegal drug sources. While these may be costly and labour intensive for small States and Territories they are crucial to supply reduction.

An important consideration in tackling markets is to minimise displacement of the drug market to another location. There has been controversy over street level policing of heroin markets in terms of claims of displacement (Maher et al., 1998). However, by comparing property crime data for ACT and surrounding areas of NSW, Ratcliffe & Makkai (2004) provide evidence suggesting that intelligence-led targeted policing can have significant effects in reducing crime. When displacement does occur, the criminal activity is often of a lesser degree both in terms of volume and seriousness (Weisburd et al., 2006; Braga, 2005). Thus, Ratcliffe and Makkai (2004) concluded that:

Although there are a number of ways in which crime reduction and prevention activity can have unintended, negative consequences...the empirical evidence suggests that a general risk of total displacement is insignificant...when compared to the gains that can be accrued from a well-planned and theoretically-sound police operation. Police managers should actively consider the possibility of a diffusion of crime prevention benefits as a potential 'free policing' benefit of an operation, spreading crime prevention profit to different crime types and other geographical areas. Actively seeking out evidence of this benefit will assist law enforcement in justifying operational expense, and planning future crime-reduction strategies. However the evidence to date indicates that benefits will eventually decay over the longer term so targeted police operations should be part of a wider crime prevention policy agenda (p.6).

Thus, there can be a diffusion of benefits, where diffusion refers to benefits created from an initiative which targets a specific location also spreading into nearby locations not targeted by the initiative (Bowers & Johnson, 2003; Ratcliffe & Makkai, 2004). However, in respect to drug crimes, mixed results are shown, with evidence of both displacement and diffusion (Lawton et al., 2005; Small et al., 2006; Green, 1996). According to Weatherburn and colleagues (1999), there is some correlational and ethnographic evidence suggesting that higher drug enforcement in one area can increase the level of drug-related activity in an adjoining jurisdiction but this may not have an entirely negative effect. The authors emphasise the need to consider the context of the environments in which the crackdowns take place and the target of the crackdowns. The authors cite Lee's economic model of illicit drug markets which describe the consequences of a crackdown on dealers which had the effect of changing the way the dealers managed their dealing rather than interfering with the volume or type of drugs sold.

## 6.6 ATS and crime

Previous research into the drugs–crime nexus has demonstrated a complex relationship between drugs and crime, and especially violent crime (Wilcznski & Pigott, 2004). Criminal career research indicates that drug dependent offenders are not a homogenous group (Nurco et al., 1995; Makkai & Payne, 2003). There are essentially three models or ideal types that are used to explain the causal links between drugs and crime (see Pernanen et al., 2002):

1. Psychopharmacological – the person was intoxicated and the intoxication resulted in antisocial and criminal behaviour;
2. Economic compulsive – the person has a drug dependency problem that 'compelled' the person to commit crimes to support their drug habit; and
3. Systemic – crime results from engagement in 'drug market' activity, such as establishing and maintaining an illicit drug market or drug-defined crimes.

Model 1 is usually applied to violent and disorderly behaviour most notably in the case of alcohol and stimulants, including amphetamine and cocaine (Makkai & McGregor, 2002). Model 2 is usually applied to property crime, most notably in the case of heroin and other

illicit drugs, but not usually alcohol or cannabis. Model 3 involves two components – offending behaviour associated with an illegal drug market and drug-defined crimes such as drug trafficking.

Determining the extent to which crime is drug related is complex and requires data at such a level of specificity that it may never be possible to collect on every individual. Until data collection and measurement are advanced in the criminal justice sector, it remains necessary to rely on samples and to a large extent on self-report data by offenders of their behaviour. Relying on administrative data, or aggregated counts, can be affected by various factors including counting rules (Carcach & Makkai, 2001), under-reporting (Chaiken & Chaiken, 1990), the funnel effect of the criminal justice system (Makkai, 2001), the effect of policing activity on detection (Lough, 1997), and clearance rates (Doak, 2001).

In reviewing the evidence in the United States, Chaiken and Chaiken (1990) concluded that there were people with severe dependence who did not commit crimes and there were criminals who did not consume illicit drugs and there was no evidence to support the view that despite patterns of interrelatedness, heavy drug users were necessarily inclined towards criminal activity. Inciardi and McElrath (1995) highlight the complexity even further:

- There are many different kinds of drugs and drug users;
- The nature and patterns of drug use are constantly shifting and changing;
- The purity, potency and availability of drugs is dynamic rather than static; and
- Drug related crime and the drug using criminal are undergoing continuous change.

With regards to drug use among criminal samples, there is considerable international and Australian evidence that most male drug using offenders are involved in criminal behaviour before the onset of their use of illicit drugs (see Chaiken & Chaiken 1990; Makkai & Payne, 2003; Johnson, 2001; Dobinson & Ward, 1985; Mayer et al., 1998). The evidence also applies for females, however, more females report drug use prior to criminal offending (Johnson, 2004).

Research investigating the association between criminal activity and ATS use can either survey community drug users about their criminal involvement, or survey those in the criminal justice system about their drug use. Research into the Sydney methamphetamine market provides information on the former. It was found that 45% of regular methamphetamine users had committed an offence in the past month, 26% had been arrested in the past year, and one third had a previous prison sentence (McKetin, McLaren & Kelly, 2005). The most common types of crimes committed by the sample were drug dealing and property crime (McKetin, McLaren & Kelly, 2005).

Research on the latter includes surveying police detainees, with levels of offending found to vary according to the type and level of drug dependency. The 2006 DUMA report (see Mouzos et al., 2007) found that detainees who are drug dependent report an average of 4.4 charges in the past 12 months and those who test positive to methamphetamine report an average of 4.2 charges. This compares to 3.8 charges for heroin users, 3.5 charges for cannabis users and 1.4 charges for those detainees who have never used

illegal drugs. When incarcerated male offenders were asked about what effect alcohol or drugs had on lifetime offending career, 37% of regular amphetamine users nominated the psychopharmacological effects compared to 12% of regular heroin users, who were more likely to nominate the economic compulsive effects (see Table 6.5).

**Table 6.5: Attributions for offending career for regular amphetamine and regular heroin users, adult male offenders (%)**

	Regular amphetamine user	Regular heroin user
Lifetime causation attribution		
Psychopharmacological	37	12
Economic/ compulsive	25	49
Drugs and alcohol led to crime	26	26
Other	12	13
(Total)	(100)	(100)

Source: Australian Institute of Criminology, DUCO Male Survey, 2001

The 2006 DUMA also reported that among police detainees, the majority of users do not personally ascribe their illicit drug use as a causal factor in their offending behaviour, with approximately one third making this attribution. It found that 14% of police detainees had purposely used methamphetamine to commit a crime. The three most common reasons they gave for using the drug were:

- Be more confident or have more courage (76%);
- Be more effective or more capable (72%); and
- Get a rush of excitement or adrenalin (65%).

With regard to links to organised crime, few users (either police detainees or regular methamphetamine users) have knowledge about the upper levels of the distribution market, particularly the manufacturing and wholesale distribution. Individuals involved in the high level supply ensure there is distance between themselves and the street market (see McKetin et al., 2005). DUMA data provide a profile of the drug user and dealer operating in a highly personalised and contained manner. Mouzos and colleagues (2007) report that the most common method of contacting a dealer for methamphetamine was calling on a mobile phone (31%), followed by visiting the dealer's house or flat (26%). The authors observed that the nature of the relationship of buyer and seller is one of investment, time and effort to gain trust and ensure reliability in terms of supply, quality and price. This relationship is further described by Ritter who noted that (2005):

... the structure of the drug trade (a diversified series of networks with variety in operations and structure); and the importance of friendships and alliances (in the freelance way in which the market(s) operate). The participants in the Miceski (2001) study describe strong loyalty to their suppliers (because of the difficulties of assessing

quality). Purity and potency were crucial issues for these dealers – their reputation and income depended upon good product (p.5).

One of the developments in the amphetamine market noted particularly during the consultations was the absence of a hierarchy of dealers. The ease with which amphetamine can be manufactured in small laboratories, including car boots and motel rooms negate the need for a distribution chain of the kind deriving from the ‘Mr Bigs’ of the heroin and cocaine markets. While outlaw motorcycle gangs have previously been identified as playing an important role in the production and distribution of domestic methamphetamine (Australian Institute of Criminology, 2007b), their influence may well be reducing given the method of amphetamine production, although importation pathways involving criminal networks in other illegal activities such as heroin trafficking remain (McKetin et al (2005). However, this conclusion is not without contention, and some law enforcement services believe that new methods of production may actually increase the influence of outlaw motorcycle gangs. McKetin and colleagues (2005) also identify some of the cultural and ethnic underpinnings that characterise some of the criminal networks involved in the trade.

Concern about the impact of criminal activities on the community was raised during the consultation process. It was noted that ATS use can exacerbate behaviours that may lead to criminal acts, including property damage and violent behaviour. Such actions may then further interfere with probation and court orders. In contrast, some discussion was directed toward the routine, operational activities of police which were seen as having the potential to be counter productive. Some participants believed that police had access to medical records that were used to determine how to manage an ATS intoxicated offender. Others were concerned that ‘hotspots’ such as needle exchange clinics could be under surveillance as a means of detecting dealers. Furthermore, police surveillance of support services such as syringe and needle exchanges has a negative impact on users and can force them into unsafe needle injecting practices.

It was also suggested that key events, such as Mardi Gras, induce police to engage in unnecessarily harsh tactics using dogs and undertaking illegal searches. Police activities at these events can result in people taking drug overdoses to avoid detection. Research undertaken for the Bureau of Crime Statistics and Research (BOCSAR) in NSW concluded that there was evidence that some drug law enforcement practices, such as aggressive street policing of drugs, may be ‘inimical to public health’ (Weatherburn et al., 1999). On the other hand, as noted earlier in a study by Ratcliffe and Makkai (2004), intelligence-led targeted policing can have significant effects in reducing crime and that when displacement occurs, the criminal activity is often of a lesser degree both in terms of volume and seriousness. However, as discussed in Chapter 6, the issue of sustainability of effects or ‘slow decay of the benefits’ is a significant issue for law enforcement (Ratcliffe & Makkai, 2004).

## 6.7 Responses to drugs and crime

The criminal justice system is constantly evolving in response to changing social, economic and political pressures. One such pressure that gathered momentum during the 1980s and 1990s was community concern about increasing crime rates (particularly property and violent crime) and the perceived link with illicit drug use and drug dependence (notably

heroin) (Payne et al., 2007). In response, Australia has experienced a significant growth in criminal justice initiatives aimed specifically at addressing the drugs/crime nexus. These initiatives encompass a broad range of interventions that are commonly referred to as diversion initiatives because they aim to divert offenders from the criminal justice system.

In broad terms, diversion involves the re-direction of offenders away from conventional criminal justice processes, with the aim of minimising their level of contact with the formal system (Payne et al., 2007). In its purest form, 'diversion' applies to those processes that occur at the pre-apprehension stage prior to any formal charges being laid and are focused on diverting individuals from the criminal justice system rather than referring to an alternative form of processing (Payne et al., 2007). One example is informal police cautioning whereby individuals, instead of being apprehended and charged, are given a verbal warning with no further obligations placed on the offender and no official record kept of the contact. Over the decades, the term has acquired broader application and is now commonly used to refer to any processing option that offers what is perceived to be a different and less punitive response than what would otherwise have applied (Payne et al., 2007). In addition, there is now a much greater emphasis on diverting individuals to an alternative program rather than simply diverting them from the system (Payne et al., 2007).

Over the past decade, diversion programs have been implemented in every State and Territory, and there are currently five main types of drug-crime diversionary programs in use across Australia (Australian Institute of Criminology, 2004). Within these broad categories, there are a large number of possible interventions and each initiative can be implemented in different ways and in different combinations. The following provides a summary of the key stages and main intervention types:

- Pre-arrest: when an offence is first detected, prior to a charge being laid. Diversionary measures here can include police discretion (e.g., offence detected but no action taken); an infringement notice (e.g., fine but no record); informal warning (no record); formal caution (verbal warning with record kept, but no further action); and caution plus intervention (i.e., warning and record, plus information or referral to an intervention program);
- Pre-trial: when a charge is made but before the matter is heard at court. Measures can include treatment as a bail condition (e.g., no conviction if recorded if treatment program completed successfully); conferencing; and prosecutor discretion (e.g., treatment offered as alternative to proceeding with prosecution);
- Pre-sentence: after conviction but before sentencing. Includes measures such as delay of sentence where the offender may be assessed or treated. The process can include sanctions for non-compliance and incentives such as no conviction recorded;
- Post-conviction/sentence: as a part of sentencing. Diversionary measures here include suspended sentences of imprisonment requiring compliance with specific conditions (e.g., participation in treatment, abstinence from drugs, avoidance of specific associates, etc.); drug courts (i.e., judicially supervised or enforced treatment programs); and non-custodial sentences involving a supervised order, probation or bond requiring participation in treatment as part of a sentence; and

- Pre-release: prior to release on parole from detention or jail. Options include transfer to drug treatment (e.g., while still in custody, being transferred to a secure residential treatment program which is supervised 24 hours a day) and early release to treatment such that an inmate may be released early from detention into a structured, supervised treatment program.

Diversion initiatives can be police-based, as with police drug diversion, or court-based, as with drug courts and intermediate court programs. Initiatives under the drug-crime diversionary programs can be divided into four groups, depending on their location along the criminal justice continuum, as follows:

- Police drug diversion. At the front end sit the various police-based drug diversion programs. These offer drug education and assessment for those individuals with minor 'possession' offences pertaining to either cannabis and/or other illicit drugs. Police drug diversion programs are among the most common types of diversion. Police drug diversion is an alternative to the court system available to persons caught with illegal drugs. Instead of an offender being charged with a drug offence, they are cautioned by a police officer. Sometimes this caution also involves the offender having to attend an education or treatment session. Police diversion programs vary widely between jurisdictions. In some states and territories police can caution only first time offenders or juveniles. In other jurisdictions diversion is available for any offender caught with drugs, irrespective of age or criminal history;
- Bail-based programs. As an intermediate response at the court level are the predominantly bail-based programs designed to provide assessment and short term treatment for less serious offenders whose criminal behaviour is related to their illicit drug use;
- Drug courts. At the higher end of the court system are the intensive pre- and post-sentencing Drug Court programs. These offer long term, intensive treatment for entrenched offenders whose drug dependence is a key contributor to their offending; and
- Drug Treatment Correctional Centres. Drug Treatment Correctional Centres operate at the custodial level. To date, NSW is the only jurisdiction to have implemented this initiative. The NSW Compulsory Drug Treatment Correctional Centre specialises in abstinence-based treatment and rehabilitation for offenders with 'long term illicit drug dependency and an associated life of crime and constant imprisonment' (New South Wales Department of Corrective Services).

Some examples of diversion programs currently being conducted include:

- Magistrates Early Referral Into Treatment (MERIT) program in NSW is a local court based, pre-plea diversion program that targets adult offenders with illicit drug use problems who may be bailed to undertake treatment and rehabilitation;
- Compulsory Drug Treatment Correctional Centre in NSW provides a new judicial supervision and treatment option allowing courts to send entrenched drug offenders to a correctional facility focused on drug treatment and rehabilitation;
- Queensland Illicit Drug Diversion Initiative provides brief (2 hour) through to intensive (6 months) treatment interventions;
- Northern Territory Illicit Drug Pre Court Diversion Program is administered through the NT Police and allows police to divert first time drug offenders in possession of a non-trafficable quantity of drugs to education and treatment;
- Court Referral Evaluation and Drug Intervention Treatment program in NT is administered through the NT Department of Justice and diverts drug users arrested for drug-related offences into treatment programs; and
- Bail Support Program in Victoria aims to enhance the likelihood of a defendant being granted bail and successfully completing their bail period by providing early intervention and access to drug treatment, accommodation, material aid and support and supervision.

Most of the police and intermediate court-based programs had their origin in and/or are consistent with the National Framework for the Illicit Drug Diversion Initiative (IDDI) that was developed by the MCDS in 1999 at the request of the Council of Australian Governments (COAG). The aim of this Framework, consisting of 19 Principles, was to 'underpin the joint Commonwealth/State/Territory development of an approach to divert illicit drug users from the criminal justice system to education or assessment, with a view to treatment' while at the same time, providing states with the flexibility to respond to local requirements (Department of Health and Ageing, 1999). This Framework, with its associated Commonwealth funding has enabled jurisdictions to either establish or expand upon pre-existing police and court-based diversion programs. Consequently, by the end of 2006, Tasmania was the only state that did not offer both types of diversion for drug and drug related offending. In contrast to this nationally coordinated approach to the initiation and/or enhancement of programs at the front end of the criminal justice system, Drug Courts generally developed independently within each jurisdiction and still rely predominantly on state-based funding.

During the consultations, there was considerable support for the principles of diversion at all levels, but there was also a view that they were applied differently both across and within jurisdictions, and rigorous evaluations needed to be undertaken. Where rural and remote communities were represented, participants commented that the opportunities for diversion weren't available. Some commented that due to the behavioural issues associated with ATS, police were less likely to give the offender the option of accessing a diversion program. It was largely agreed that rehabilitation was crucial to the good management of ATS harms and prevention, but there needs to be a holistic approach across police, health professionals

and hospital workers, with consumers referred to accredited agencies. A number of consultations highlighted that custodial settings can be a first step towards intervention, prevention and rehabilitation, while some felt the police needed more power to arrest people. The submission from Drug Free Australia (DFA) suggested the need to:

Establish mandatory drug rehabilitation for problem drug users of amphetamines, particularly 'ice', as an alternative to jail sentences...divert Corrective Services funding to organisations which can provide either residential rehabilitation or intensive psychosocial counselling and support.

During the consultations some held the view that a national drug strategy did not need to differentiate between drugs (given the commonalities), while others argued that ATS have characteristic effects different from those of other drugs that require specific responses. This debate is complicated further by the fact that many ATS consumers are polydrug users.

One of the themes of the consultations was the divergence in opinion about the efficacy of drug courts and the capacity of the courts to effect change in offenders' behaviour. The MERIT program received considerable support during discussions, although it is not widely available. During consultations, the need to strengthen opportunities for the support and training of police and to make provision of alternative placements for offenders (other than watch-houses and hospitals) who need respite was also highlighted. Other recommendations focused on treatment and other supports for offenders, particularly within the criminal justice system. The emphasis of the discussions and comments focused on prevention and rehabilitation. Many statements referred to the need to assess the amount of funding provided to law enforcement and that provided for treatments. The general view was that more money was used to fund law enforcement initiatives than health, social intervention and treatment, and that funding should be based on a return on investment model.

A number of consultations referred to the need for post release support for prisoners as a critical issue. Provisions of parole, the stigma of prison, loss of goods and identity, and lack of financial support are significant in people's reintegration or re-offending. Reference was made to New Zealand initiatives for assisting prisoners to re-enter the community. There are high rates of ATS users in prisons going 'cold turkey' (i.e., having no management of their withdrawal symptoms) who are then released into the community with no support. Often their friends and acquaintances are still using and it is therefore easy to return to the previous lifestyle of drug use and crime. A need was expressed for halfway houses for ex-prisoners to go to when released. Also, there was concern over the lack of forensic mental health specialists in the drug and alcohol field.

The issue of co-morbid mental health problems and drug use among the prison population has been subjected to some research. Heffernan and colleagues (2003) investigated the prevalence of substance-use disorders and psychological morbidity among 288 police arrestees at the Brisbane City Police Watch House. The study found that 86% of arrestees had at least one substance-use disorder, over 80% were substance dependent and amphetamine was among the most predominant drugs used. The vast majority of the sample exhibited significant psychological distress, reported by 82% of males and 94% of females.

Other research has compared psychological disorders among prisoners in comparison to community samples. Butler and colleagues (2006) compared data obtained from 916 prisoners admitted into the NSW correctional system with an Australian National Survey of Mental Health and Wellbeing. After controlling for demographic differences between the samples, the 12-month prevalence of any psychiatric illness within the previous year was 80% in prisoners and 31% in the community. The most common disorders among the prisoner sample were symptoms of psychosis, substance use disorders and personality disorders. White and colleagues (2006) specifically investigated psychosis in a sample of 621 remandees at a Queensland centre and 61 screened positive for a psychotic disorder (9.8%). Of this sample, 80% were dependent on alcohol, cannabis or amphetamine, and 81% were receiving no treatment at the time of their offence.

Some examples of current initiatives that address health issues for prison populations include:

- Custodial Health and Alcohol & Drug Nurses Project (CHAD) is an alcohol and drug treatment support service for prisoners in police cells across Victoria. CHAD nurses undertake health assessments of detainees within one working day of incarceration and can offer drug treatment or substitute pharmacotherapy for those experiencing substance withdrawal while in detention;
- Adelaide City Watch House Community Nursing Service places nurses within the Adelaide City Watch House to provide a number of interventions to detainees and to support police;
- SMART Recovery, Drug and Alcohol Addictions Program and associated Relapse Prevention Program, and the Criminal Conduct and Substance Abuse Treatment Program are CBT based programs provided through the NSW Department of Corrective Services; and
- 'Sisters Inside' is an organisation providing programs and support for incarcerated women.

### Juvenile justice services

The overall incarceration rate for juveniles has declined 58% from 65 to 27 per 100,000 from 1981 to 2005 (Australian Institute of Criminology, 2006). The Drug Use Careers of Offenders (DUCO) survey was conducted with a sample of 371 young offenders aged between 11 and 17 years who were remanded in or sentenced to detention in 2004 (Prichard & Payne, 2005). In terms of drug use, almost all juvenile detainees reported lifetime use of alcohol or cannabis, and half reported amphetamine use. In the six months prior to detention, 63% reported using cannabis on a regular basis and 20% reported regular amphetamine use. The links between drugs and crime were measured in a number of ways in this study and the results suggested that the majority of juveniles did not commence drug use until after their first offence; however two thirds reported being intoxicated (either drunk on alcohol or high on drugs) at the time of committing the offence/s for which they were now in detention; and the majority of juveniles reported that drug use had a definite impact on their lifetime criminal offending behaviour.

Diversion initiatives with juvenile offenders can be traced back to the establishment in the late 19th century of the first children's court, which was designed to redirect offending

children away from punitive adult courts into a more informal and more benign system which could better meet their need for specialist guidance and treatment (Seymour, 1988). Currently, most states and territories include 'victim-offender conferencing' as part of juvenile justice, which typically involve the victim, the young offender and representatives from the criminal justice system. The aim is to develop a negotiated response to the crime with the young person taking responsibility for the offence, and for the needs of both the victim and the young person to be heard and met (Australian Institute of Health and Welfare, 2007). Conferences may be held at a number of stages of the juvenile justice process and are administered variously by the police, courts or juvenile justice department. The range of juvenile justice services is outlined in Table 6.6.

Discussions about juvenile justice issues during consultations focused on support and treatment in the case of ATS, with an emphasis on the need to determine whether offences committed had an underlying drug element. Again, as with the case of many issues around juvenile offending, access to diversion and treatment options depend on geographic location. Those in rural areas commented that offending juveniles had to be transferred away and removed from their families as there are no holding facilities available locally.

**Table 6.6: Range of juvenile justice outcomes and services available by state and territory, June 2006**

Juvenile justice outcomes and services	NSW	VIC	QLD	WA	SA	TAS	NT	ACT
Pre-court pre-sentence diversionary outcomes								
Informal caution/warning	✓	✓	✓	✓	✓	✓	✓	✓
Formal caution	✓	✓	✓	✓	✓	✓	✓	✓
Conferencing	✓	✓	✓	✓	✓	✓	✓	✓
Does not involve juvenile justice department								
Discharge	✓	✓	✓	✓	✓	✓	✓	✓
Fine	✓	✓	✓	✓	✓	✓	✓	✓
Obligation without supervision	✓	✓	✓	✓	✓	✓	✓	✓
May involve juvenile justice department								
Good behaviour bond	✓	✓	✓	✓	–	–	✓	✓
Bail/pre-sentence support and supervision	✓	✓	✓	✓	✓	–	✓	✓
Conferencing	✓	–	✓	✓		✓	✓	✓
Community-based supervision (probation)	✓	✓	✓	✓	✓	✓	✓	✓
Community service	✓	✓	✓	✓	✓	✓	✓	✓
Suspended detention	✓	–	✓	✓	✓	✓	✓	–
Home detention	–	–	–	–	✓*	–	✓	–
Custodial remand	✓	✓	✓	✓	✓	✓	✓	✓
Detention	✓	✓	✓	✓	✓	✓	✓	✓
Supervised release from detention	✓	✓	✓	✓	✓	✓	✓	–

Note: Shaded cells indicate items that are within NMDS scope and for which data are collected in the NMDS. Other ticked cells indicate juvenile justice outcomes and services that the states and territories offer, but which are outside the scope of the NMDS.

\* Indicates items which are within NMDS scope but for which data are unavailable for the NMDS.

Source: Australian Institute of Health and Welfare (2007) Juvenile justice in Australia 2005-06, Canberra: Australian Institute of Health and Welfare

## Rehabilitation in Corrections

The adult prison population in Australia is increasing. Data from the Australian Bureau of Statistics – 2006 Prisoners in Australia (Trewin, 2006b), show an increase of 42% from 18,193 in 1996 to 25,790 in 2006. According to the Australian Institute of Criminology (2007a), 60% of prisoners in 2006 were known to be in prison previously. The median age of prisoners is 33, with most prisoners (70%) aged between 20-39 years.

According to the 2006 Prisoners in Australia (Trewin, 2006b), of those sentenced for illicit drug offences in 2006, 5% were sentenced to fewer than 12 months, 12% to between two and five years and 14% between five and ten years. The New South Wales Justice Health Service (2005) reports that about 80% of people in custody have committed drug related crimes. By comparison with the other purposes of prison such as acting as a deterrent to further offending or as punishment, the capacity of corrections to effect rehabilitation is very dependent on the lengths of prison sentences and the rehabilitation programs available to them.

Black, Dolan and Wodak (2004) undertook a study of supply, demand and reduction strategies in Australian prisons. The authors commented on the absence of information about the effectiveness of some strategies, the long term consequences of these strategies in terms of benefits and adverse consequences, and their costs. The study found, for example, that supply reduction strategies which include drug detection dogs and urinalysis are yet to be evaluated in terms of overall benefits, value and cost. The study identified favourable outcomes for some demand reduction strategies including detoxification, methadone treatment, inmate programs and counselling, and drug-free units but found that the availability of these services was insufficient. There was also evidence of insufficient implementation of relatively inexpensive harm reduction strategies such as education, peer education, blood-borne viral infection (BBVI) testing, hepatitis B vaccination, condom provision, bleach/detergent provision, naloxone provision and needle and syringe programs despite favourable evaluations and their relatively low cost of implementation.

In 2006, a draft National Corrections Drug Strategy 2006-2009 was developed to complement the National Drug Strategy. It identified six principles for consideration by jurisdictions. These include:

- Achieve an appropriate balance between the priority areas of supply reduction, demand reduction and harm reduction;
- Provide services to a level equal to those provided in the wider community;
- Support the specific needs of Indigenous people;
- Use evidence based good practice examples;
- Establish partnerships across relevant agencies and support organisations; and
- Provide a continuity of care throughout the period of sentencing and beyond.

## 6.8 Multilateral approaches

In recent years, a focus on policing the supply of precursor chemicals has shifted towards a pluralised approach, whereby the responsibility for chemical diversion is dispersed among many different agencies and community groups (McKetin et al., 2005). Support for partnerships was expressed in the consultations, with a view that states and territories are developing good linkages, and effective strategic and operational initiatives. The National Precursor Working Group was seen as an important body for legislation and strategic planning involving precursors, pill presses and other apparatus, and the application of the model criminal code. Project Stop was recognised as a good example of how coordinating policy across the country and in consultation with the pharmaceutical industry can effect change.

In most discussions at consultations on best practice for ATS precursor diversion, it was noted that there are limitations to intervening on ATS proliferation via precursor strategies alone. Given the resourcefulness of organised crime groups, some research has argued that the effects of interrupting the supply of precursors (such as an escalation of street price, a reduction in violent crime and drug arrests) were only temporary and lacked any lasting deterrence (Cunningham & Liu, 2005).

A key focus of reducing supply is that of the cross-section between criminalising illicit precursors, and regulating the legitimate market of drugs and equipment in which precursors are found (Cherney et al., 2005). This double supply side presents a unique challenge to law enforcement. Increasingly, criminal markets have turned to other outlets, whereby legal drugs and equipment are obtained through pharmacies and other outlets (such as 'pseudo runs') (McKetin et al., 2005). There has been a focus on enhancing industry partnership approaches to respond to the threat of precursor chemicals. Such partnerships yield several benefits and advantages in the pursuit of the control of licit and illicit ATS precursor chemicals, including:

- The ongoing monitoring and supervision of licit chemical sales, frees police and law enforcement to undertake investigations into larger illicit operations and known 'pseudo-runners';
- Police resources can be better targeted to known problem areas, with less time taken to having a street-level presence;
- A more streamlined approach across the private sector (from supermarkets, to pharmacies, to production plants) can be maintained with set industry standards which has legislative backing; and
- Partnerships with local companies and those in the industry are better fostered and involved in the process of regulating precursor chemicals and can also assist in the investigation and prosecution of illicit precursor trade (Ministerial Council on Drug Strategy Joint Communiqué 2007).

National activities have been enhanced with new funding for a range of law enforcement responses to ATS (see Table 6.7). Key initiatives include:

- The ACC's Response to the Production and Distribution of Amphetamines and Other

Synthetic Drugs measure will improve illicit drugs information and intelligence, and investigate organised crime drug distribution networks and methodologies to assist in mitigating the risk of emerging illicit drug trends;

- The ACC's National Illicit Drug Strategy: Enhanced Technical Capability (Additional Funding) measure will enhance capacity for telecommunication and data interception capacity, which will assist the targeting and disruption of serious and organised criminal groups and individuals involved in the manufacture, importation and distribution of illicit drugs;
- The AFP's Amphetamine-Type Stimulants Enhanced Investigative Capacity measure will enhance the Australian Federal Police's capacity to pursue amphetamine-type stimulants investigation work by establishing a team with the skills, training, capacity and equipment to be rapidly deployed anywhere in Australia or the Asia Pacific region at short notice to investigate significant amphetamine-type stimulant-related offences;
- The AFP's Expansion of the International Liaison Officer Network measure will increase the flow of criminal intelligence and the number of joint operations with foreign police agencies concerning the production and trafficking of amphetamine-type stimulants;
- Customs' Expansion of Reference Spectral Libraries, Upgrade of Spectroscopic Detection Fleet, and Installation of Portable Fumehoods at Container Examination Facilities measure will enhance detection of methamphetamine, other synthetic drugs and their precursors at the Australian border; and
- The Australian Institute of Criminology's DUMA Expansion measure will add two new sites to collect data from police detainees in Melbourne and Darwin to further improve the Government's evidence base and understanding of ATS markets, offenders' use and treatment needs.

State and Territories have also implemented a range of initiatives; some examples are shown in Table 6.7.

Many of the initiatives identified above address some of the concerns raised during the consultations about the capacity of law enforcement agencies to deal with issues of supply and distribution effectively using proactive and reactive law enforcement strategies. The consultations also emphasised the need for State and Territory law enforcement agencies to know which strategies (or combination of strategies), are likely to be most effective in reducing supply and distribution.

The \$18.8 million anti-drug strategy announced by the Premier of New South Wales (NSW) in March 2001 is one of a number of examples of Australian State and Territory jurisdictions tackling drugs and drug related crime that go beyond interdiction and precursor controls at a national level. The strategy was a whole-of- government response incorporating proactive and reactive interventions through legislative change, targeted street and frontline policing and other initiatives around prevention, intervention, enforcement and treatment. Although other areas of the state received funding from the strategy, Cabramatta, within the NSW police statistical division of Fairfield-Liverpool, was the focus for the main thrusts of the strategy.

Table 6.7: Examples of State and Territory law enforcement initiatives

NSW
<p>The NSW Government's dedicated Drug Budget for 2003/04-2006/07 includes specific funding for the Bureau of Crime Statistics and Research to conduct special research into drug crime trends including those emerging such as crystal methamphetamine and methamphetamines.</p> <p>Illicit Drug Monitoring Group – an expert group established to monitor and advise the NSW Government on emerging drug trends.</p>
South Australia
<p>Designer Drug Early Warning System (D2EWS) - The system monitors the incidence and clinical effects of intoxicating substances at Royal Adelaide Hospital Emergency Departments. The primary objective of the D2EWS is to determine the range of drug use patterns that result in admission to Emergency Departments. The initiative is used to inform operational police of local illicit drug trends and will enable the development and implementation of timely prevention and intervention strategies in line with the changing picture of substance misuse that have potentially fatal consequences. This is a collaborative project between the Royal Adelaide Hospital Emergency Department, the Drug and Alcohol Service of South Australia and Forensic Science South Australia.</p> <p>In 2005, DUMA's Amphetamine Bulletin was disseminated across Adelaide POL and government. The Bulletin highlighted the prevalence of methamphetamine use amongst detainees in the two South Australian DUMA sites. DUMA information is also used for policy development.</p>
QLD
<p>The joint Crime and Misconduct Commission and Queensland Health Amphetamines in Queensland Research Project is being replicated. The first research study was undertaken in 2002. The study details findings about amphetamine users and their health problems and will guide the development and delivery of Queensland Health programs.</p>
NT
<p>The Northern Territory Police facilitated the Drug Use Monitoring Australia (DUMA) data collection conducted by the Australian Institute of Criminology during 2006. The Data will be used to assist in policy development and a possible change in legislation to reschedule amphetamines.</p>
Tasmania
<p>Tasmania Police has established partnerships with transport operators to raise awareness, detect and disrupt the importation of precursors and controlled drugs into Tasmania.</p>

Source: Ministerial Council on Drug Strategy Joint Communiqué 16th May 2007 'NATIONAL LEADERSHIP FORUM ON ICE – COMPENDIUM OF JURISDICTIONAL ACHIEVEMENTS' <http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/publishing.nsf/Content/mcdis-16may07-communicue>

Frontline reactive strategies concurrent with the development of inter-agency partnerships and legislative change included the establishment of strike forces to tackle gang crime; boosting police numbers to increase detection and the visible presence of police on the streets; coordinating frontline intelligence; improving recruitment strategies and training opportunities; strengthening information technology, including data base capacity and activities; and implementing initiatives to strengthen relationships with community groups and young people. Early reports were encouraging. According to the NSW Bureau of Crime Statistics and Research (Chilvers et al., 2002), there was a reduction in the following crimes thought to be drug related in Cabramatta between January 2000 and December 2001:

- Motor vehicle theft decreased by 37%;

- Stealing from motor vehicle decreased by 24.8%;
- Robbery with a weapon other than a firearm decreased by 7.1%;
- Robbery without a weapon decreased by 4.9%; and,
- Weapons offences in general decreased by 19.2%.

Data from the NSW Recorded Crime Statistics for the years 2000-2006 in narcotics and cocaine possession/use and dealing/trafficking, and over the period 2002-2006 for amphetamine and MDMA possession/use and dealing/trafficking within fourteen Sydney NSW police statistical divisions, identify considerable variations across these divisions in terms of history of drug use and prevalence. However, trends and patterns emerging for the Fairfield-Liverpool statistical divisions in which Cabramatta is located, suggest in the absence of other evidence, that the interventions of the anti-drug strategy influenced patterns and trends in supply, distribution and use with regard to narcotics, cocaine and MDMA. The success of the interventions over time is less evident with regard to criminal incidents recorded for amphetamine.

### International collaborations

The AFP has an extensive network of out-posted AFP Liaison Officers in 28 countries and collaborates with international partners through a range of mechanisms. This includes the activities of the Law Enforcement Co-operation Program (LECP), which focuses on building partnerships with overseas law enforcement agencies and the provision of precursor and clandestine laboratory investigative assistance to international police agencies. The AFP has also signed Memoranda of Understanding (MoUs) on Combating Transnational Crime and Enhancing Cooperation with various international law enforcement agencies.

Australian Customs uses its network of international representatives to progress policy and operational initiatives in relation to ATS and their precursors. Australia has bilateral agreements with a number of overseas Customs administrations to enhance the exchange of information related to Customs activities including ATS-related matters. Customs provided illicit drug and explosive precursor detection and handling training to Indonesia Customs in 2005 and other law enforcement agencies in Malaysia and Philippines during 2006.

Project PRISM is an international project aimed at preventing the diversion of chemical precursors used in the manufacture of ATS. The International Narcotics Control Board of the United Nations coordinates the project and Customs is the central national authority for Australia's participation. Customs is also a member of the Project PRISM Task Force, the governing body of the Project. In this capacity, Customs acts as the regional focal point for Oceania.

The South Pacific Precursor Control Forum (SPPCF) was initiated by Australia in 2007. It aims to contribute to preventing the manufacture of ATS and the diversion of precursor chemicals into illicit drug manufacture in the Pacific region. An agreement was reached between members to examine their existing precursor regulations as well as investigate their capacity for information sharing, forensic capability, technical assistance, public awareness and education. In the long term, it was agreed that the SPPCF should develop

a Regional Strategic Plan to respond to ATS and precursor control. The Asian Collaborative Group on Local Precursor Control (ACoG) was established in 2006. It aims to complement existing law enforcement initiatives in the region by focusing on best practice regulatory, administrative and legislative policies to prevent precursor diversion within national borders.

## 6.9 Priorities in law enforcement

The issues of law enforcement form a substantive part of this background paper as they are fundamental to the principal aspects of ATS management in reducing supply, reducing demand, and minimising and ameliorating harmful effects. Major themes emerging from the consultations and submissions concerned legislation (Commonwealth, State and Territories), policy and policy implementation, and operational procedures as they apply to the day-to-day routine activities of law enforcement officers. The evidence of the information gathering process suggested a need for an inter-jurisdictional and coordinated response in these matters. There is also a need to ensure community understanding about the type of responses adopted by law enforcement in targeting ATS.

The role of law enforcement has traditionally been viewed as reducing the supply of illicit drugs. Though supply reduction remains the principal focus for law enforcement, these agencies also play an important role in the development and delivery of demand and harm reduction strategies. As confirmed during the consultations, police have increasingly become involved in early intervention programs through the referral of illicit drug users to health and welfare agencies under the Illicit Drug Diversion Initiative. They have also moved towards the implementation of non-criminal justice related outcomes for minor drug offenders.

In 2007, Australian law enforcement agencies developed a national policy framework to assist in promoting a coordinated and integrated response to the harms and challenges presented by ATS. The resulting strategy represents a holistic law enforcement approach to ATS, emphasising, for example, the important role played by law enforcement officers in supporting the development and delivery of education programs, dealing with drug affected individuals, and facilitating the entry of drug users into treatment plans and diversion schemes. The aim of the strategy is to improve social, economic and health outcomes by preventing the production, consumption and trafficking of ATS, and reducing the harmful effects of ATS on the Australian community. The strategy aims to realise three outcomes:

- Reduced availability of ATS in Australia;
- Reduced demand for ATS in Australia; and
- Reduced impact of ATS on individuals, families, and communities.

Throughout the consultations with law enforcement agencies, strong support was given to the framework. As a result, the framework was wholly adopted in this background paper which is consistent with the Ministerial Council on Drug Strategy (MCDS) decision in 2006. The priority areas identified in the Law Enforcement Component of the National ATS Strategy 2006-2009 as approved by the MCDS are as follows.

Priority Area 1: Community Understanding of ATS manner of manufacture and

## criminal offences

There continue to be community misconceptions about the use of ATS. The use of terms such as ‘party drugs,’ ‘recreational drugs’ and ecstasy provides an implicit message of fun, pleasure and, in the case of ‘ice,’ purity of methamphetamine. There is a lack of awareness of the true manner in which ATS is manufactured and the significant harms that may arise from the manufacturing process and use of ATS.

The community’s perception of the criminality of possession, use and trafficking in ATS needs to be enhanced. There is also a need to ensure the community understands the type of responses being adopted by law enforcement in response to the threat of ATS – including the use of diversion from the criminal justice system to treatment and education, controls on precursor chemicals and equipment, successes in seizing drugs and proceeds of crime.

The objective of this priority area is to increase awareness among the Australian public about ATS, its manner of production, its harms and the enforcement of its illegal status. Recommended activities are:

- i. In partnership with other sectors of Federal, State, Territory and local Government, the non-government sector, the media and the community, support the development and delivery of public awareness campaigns. The content of campaigns should include:
  - the physical, psychological and social harms of ATS use;
  - the nature of ATS manufacture, including clandestine drug laboratories;
  - the types of substances often found in illicit drugs and the conditions under which they are produced;
  - the criminal penalties for ATS possession, use and trafficking; the availability and success of treatment options, and;
  - law enforcement approaches to ATS, including how the community can assist in the achievement of law enforcement successes, such as through involvement in community cooperation programs; and
- ii. Consider the appropriateness of a nationally consistent policy among Australian police about how to report on ATS seizures and other law enforcement successes.

In addition, recommendations from the consultations suggest a need to ensure that media reports reflect the realities of supply, demand and harmful effects of ATS. They also suggest the importance of law enforcement agencies publicising their achievements.

## Priority Area 2: Preventing the supply and use of ATS

The Strategy seeks to promote innovative and targeted responses to prevent the supply and use of ATS in the community. It focuses on promoting informed and intelligence-led law enforcement strategies and exploiting inter-jurisdictional and inter sectoral partnerships and synergies. Furthermore, the Strategy recognises that the breadth of supply reduction activities has a greater cumulative effect than simply reducing the availability of ATS in the community—there are a number of flow-on benefits, such as:

- reinforcing the message that illicit drug use is not condoned by the community;
- raising awareness amongst the community that use and manufacture of illicit drugs is illegal and carries significant penalties;
- increasing the likelihood of people seeking treatment;
- reducing the funds available for illicit drug purchase by prosecuting associated crime; and
- the deterrent effect of successful law enforcement operations involving commitment, cooperation and sophisticated capabilities, on those involved in illicit drug supply.

This Priority Area includes measures that seek to prevent or delay the onset of ATS use. Drug use is but one of a number of health outcomes that may share common determinants which can cluster in vulnerable individuals and population groups. Wide-ranging and broad-based interventions need to be considered to address drug problems in an integrated way across the whole community.

Prevention reflects the need to build community resilience and cohesion through broad based programs and activities. Such programs should focus on addressing identified social and structural determinants of community health and drug use, including risk and protective factors that affect individual probabilities of drug use. There is a need to consider a wider range of interventions that acknowledge and address the social origins of poor health and health risk behaviours at all levels – individual, family, community and across the population. As well as influencing drug use in the community, such interventions would positively influence education, employment, health and crime outcomes.

Law enforcement plays a significant role in the prevention of ATS use. Law enforcement agencies implement programs to reduce the amount of drugs in Australia and raise public awareness through involvement in community-based ATS education programs. The following objectives and related activities are recommended:

- i. Disrupt and dismantle the production and trafficking of ATS into and within Australia through the following activities:
  - Continue intelligence-led law enforcement activities to disrupt criminal activity, including dismantling organised crime syndicates engaged in ATS related activities, with particular emphasis on facilitators, importers, manufacturers, distributors and ‘cooks’;
  - Review the effectiveness and efficiency of the current proceeds of crime arrangements nationally from a law enforcement perspective;

- Increase international collaboration with overseas agencies to identify and respond to ATS manufacture and trafficking operations, emerging products, precursors and technologies of concern;
  - Increase State and Federal cooperation and collaboration among law enforcement on joint precursor, ATS and clandestine laboratory seizure operations;
  - Increased efforts to engage with overseas agencies to enhance local enforcement capacity in the control of key chemicals and equipment and operational responses;
  - Increased effort in the monitoring of the importation of key chemicals and equipment at the border from a regulatory and intelligence perspective;
  - Continue Australia's participation in international activities such as the International Narcotics Control Board's project PRISM, and enhance the impact within Oceania of Australia's commitment to reducing the diversion of ATS precursors into illicit manufacture in the region;
  - Investigate new technologies for detecting ATS and their precursors at the border;
  - Investigate internet facilitation of ATS and their precursors, and increased investigations targeting online sites;
  - Continued support of State and Territory Chemical Diversion Desks or similar;
  - Continue close monitoring of domestic diversion of key chemicals and equipment; and
  - Continue State and Territory led investigations and activities to detect and dismantle clan labs within Australia.
- ii. Prevent the illicit supply of precursor chemicals and equipment through the following activities:
- Continued support for the activities of the National Working Group on Preventing the Diversion of Precursor Chemicals. This will include development and implementation of the National Clandestine Laboratory Database; identifying and responding to emerging trends and threats in the diversion of chemicals and equipment and ATS manufacture; assessing the continued adequacy of controls on precursor chemicals and related equipment used in the manufacture of ATS, with a view to developing more effective controls; development of a national regulatory approach to the control of essential precursor chemicals and equipment which draws on the National Code of Practice; development of awareness raising activities for the community, industry and government of the risks and signs of ATS manufacture and the diversion of chemicals and equipment; devising a national regulatory framework; supporting the development and delivery of law enforcement training initiatives, such as extending the Customs Precursor Training Program to law enforcement agencies; enhancement to information and intelligence databases for law enforcement, such as the National Industrial Chemicals Notification and Assessment Scheme;

- Support the national roll-out of Project STOP to provide pharmacists, law enforcement and health agencies with information on the purchase of pseudoephedrine based medicines; and
  - Support industry development of alternative products to pseudoephedrine which are not susceptible to diversion to ATS manufacture.
- iii. Improve intelligence and information-sharing capabilities of Australian law enforcement agencies and related sectors through the following activities:
- Continue to improve and increase intelligence-led law enforcement practices, with particular emphasis on the use of the ACC's Australian Criminal Intelligence Database and the National Clandestine Laboratory Database. This will involve ensuring the timely provision of ATS related information and intelligence between jurisdictions; ensuring timely release and widest appropriate distribution of intelligence products; continuation of national forums which bring together investigators and intelligence experts from all jurisdictions;
  - Continued support for, and networking of Chemical Diversion Desks in each jurisdiction, including the coordination and exchange of information and intelligence;
  - Enhance existing intelligence arrangements for law enforcement to access corrective services intelligence, and prisoner information on ATS production and trafficking on a national basis, including visitation programs;
  - Continued use of ACC coercive powers and dissemination of intelligence on a national basis;
  - Continued support for the operation of the National Chemical Diversion Congress;
  - Continued support for the further development and refinement of the ATS Signature Program under AIDIP and improve exchange of timely and quality information between law enforcement and forensic officers on seized chemicals and substances; and
  - Develop awareness campaigns to improve provision of information to community, industry and other government sectors, by highlighting risks and dangers associated with ATS manufacture, including increased risks to children, the environment and emergency responders; signs of illicit activity and importance of community, industry and local government assistance to police; law enforcement responses and successes in the detection and prosecution of ATS offences; and the seriousness of ATS-related offences, including their impact on the community and the range of penalties available for ATS offences.
- iv. Adequate laws are in place to respond to ATS related activities. This includes:
- Ensuring national legislation is implemented in respect to remediation of clandestine drug laboratory sites;

- Ensuring offence and penalty provisions remain appropriate in light of emerging ATS trends and threats, including appropriate coverage of possession and use of precursor chemicals and equipment for the purpose of manufacturing ATS; exposure of children to clandestine laboratories; use of children for trafficking ATS; and sale of ATS to children;
  - Review the regulations surrounding the sale of devices used for ATS consumption;
  - Support the work of the National Scheduling Committee; and
  - Ensure law enforcement has appropriate powers to respond to the ongoing and evolving ATS threat.
- v. Stronger focus on the need to strengthen community resilience and resistance to ATS manufacture, use and its harms:
- In partnership with other sectors of government and the community, support the development and, where appropriate, the delivery of community prevention/intervention measures that acknowledge and address origins of poor health and risk health behaviours at all levels (individual, family, community and across the population). This includes neighbourhood building/community regeneration strategies and projects; crime prevention through environmental design projects; school-based drug education and social influence programs; at-risk youth, early intervention and mentoring programs; and parenting skills programs;
  - Ensure, wherever possible, that law enforcement policies, programs and activities effectively link with health, education and other government policies and programs;
  - Ensure partnership with correctional and juvenile justice authorities and other sectors of government and the community, support the development and delivery of education programs for prisoners and juvenile detainees about the dangers and risks of ATS use and programs that build resilience and life skills/opportunities; and
  - Ensure police and corrective services are aware of particular prevention/early intervention programs available to local communities and individuals and that, wherever possible, appropriate linkages and protocols are in place to facilitate referral to relevant agencies.

### Priority Area 3: Preventing harms associated with ATS

Law enforcement agencies are continuing to play a greater role in the implementation of harm reduction initiatives. This may take the form of providing access to drug diversion programs for minor offenders, drug driving responses, and responding to violence and property offences which arise from the use of ATS. The priority area promotes responses consistent with the role of police as first responders to the results of ATS use, trafficking and manufacture on individuals and the community. Within this there is a need to prevent adverse health impacts of clandestine laboratories both to first responders and the community. The following objectives and related activities are recommended:

- i. Support for the use of the Illicit Drug Diversion Initiative (IDDI):
  - Support a review of the effectiveness of the IDDI in terms of the criteria adopted for participation, the availability of treatment and education responses, the participation rate and outcomes for participants;
  - Ensure adequate training of police in the use and benefits of the IDDI;
  - Support a review of the level of integration of IDDI with existing drug and alcohol programs; and
  - Educate offenders and the community about the benefits of IDDI.
- ii. Reduce personal and social disruption leading to an increased quality of life, reduced loss of life, reduced loss of productivity and other economic costs associated with ATS use:
  - Train police and other emergency responders to deal with individuals exhibiting violent and erratic behaviour—who may be affected by ATS—in a way that limits harm to themselves and others;
  - As appropriate, establish effective mechanisms to enable the dissemination of information about emerging ATS issues and associated risks;
  - Continued evaluation of drug driving initiatives with a view to national adoption; and
  - Ensure training for law enforcement officers is adequate to safely identify and handle precursor chemicals and ATS.
- iii. Improve the national response to seized clandestine laboratories to prevent harms:
  - Implement as appropriate, the national guidelines to assist Jurisdictional responses to clandestine drug laboratories, and review as necessary;
  - Ensure training for law enforcement and other emergency responders is adequate to safely respond to ATS risks including entering and dismantling clandestine laboratories, identification and proper handling of precursor chemicals;
  - Provide input and leadership into the development a national framework for remediating clandestine laboratory sites; and
  - Establish effective collaborative linkages or protocols with child protection agencies for the provision of medical checks and care for children found at seized clandestine laboratories.

#### Priority Area 4: Responding to harms associated with ATS

Evidence continues to grow about the serious physical and mental harms associated with ATS consumption and manufacture. The availability of treatment services for users of illicit drugs is essential to meeting this challenge. While preventing the uptake of harmful drug use is vital, it is also essential to provide treatment services for people who experience drug-related problems or who are drug dependent.

Law enforcement agencies are playing an increasingly important role in the harm reduction and demand reduction strategic areas of the National Drug Strategy, including responding to drug users and drug affected individuals. Law enforcement agencies are in regular contact with at-risk individuals or individuals already suffering from drug related harms. Consequently, law enforcement is able to aid the diversion of individuals to timely and appropriate treatment plans and/or early education programs. The following objectives and related activities are recommended:

- i. Improve understanding among law enforcement personnel about interventions, treatments and support for ATS users:
  - Ensure training for law enforcement officers is adequate to assist with awareness of benefits and availability of referral to treatment, education or early intervention for individuals with ATS related problems, including mental health and drug comorbidity; police officers ability to able to deal with people exhibiting violent and erratic behaviour, which may result from ATS intoxication; and
  - Ensure effective coordination arrangements exist between law enforcement and health, mental health, and social welfare agencies.
- ii. Improve access for ATS users to high-quality treatment services:
  - Support the accelerated implementation provision of effective broad ranging treatment options for dependent users of ATS.

## 6.10 Summary

It has been estimated that Australia expends between \$1.3 and \$2 billion annually on drug law enforcement activity (Hemel & Willis, 2007). This chapter has provided an overview of policy and strategies which go far beyond interdicting and disrupting supply or noting the number of drug seizure and arrest as measures of successful interventions. The model of law enforcement tackling illicit drugs reflected in this chapter is multi-layered increasingly incorporating proactive and partnership interventions. Relationships between international agencies, the Commonwealth, States and Territories and between policing, the criminal justice system, human services, corrections and health are increasingly cooperative and collaborative. These interventions include international provisions and domestic legislative responses acknowledging the drug trade as a borderless activity in preventing supply, responses to crime through diversion and juvenile justice services, collaboration with the community through awareness campaigns and engaging the cooperation of the pharmaceutical and transport industries.

The developing role of drug law enforcement requires a concomitant development in evaluating these interventions and measuring outcomes. A framework for measuring the effectiveness of the work performance of drug law enforcement agencies has recently been developed (Hemel & Willis, 2007). The framework recognises that such measures must move away from those traditionally used to consider the broader impacts of law enforcement work and identifies outcomes related to the principles of the National Drug Strategy, (many of which are referred to in this and other chapters), designed to reduce drug

crime and drug-related crime (measured by drug price, purity and availability, as well as measures concerned with drug trafficking practices). Other measures are those designed to reduce organised crime (measured by elements concerned with trafficking); those designed to improve public health (measured by trends in illicit drug-related deaths and morbidity and the health services underpinning these), and those designed to improve public amenity (measured by trends in community safety and wellbeing and incorporating measures of the initiative in the management of offenders) (Homel & Willis, 2007).

# Appendix 1

## National consultation forums

Jurisdiction	Place	Date	No. of participants
NSW	Sydney	5th March	25
WA	Bunbury	6th March	14
WA	Perth	8th March	22
ACT	Canberra	13th March	27
NSW	Albury-Wodonga	16th March	14
QLD	Brisbane	4th April	48
QLD	Cairns	3rd April	12
SA	Adelaide	16th Apr	41
SA	Whyalla	17th Apr	12
VIC	Melbourne	1st May	37
VIC	Bendigo	2nd May	10
TAS	Hobart	3rd May	21
NT	Alice Springs	22nd May	9
NT	Darwin	23rd May	25
QLD	Weipa	20th June	7
NSW/ACT	Consumer groups		27
VIC	Youth		3
WA	Indigenous		105
Various	Key organisations/ individuals		56
Total			515

## Consultations with key organisations

Alcohol, Tobacco and Other Drugs Services (ATODS) Queensland

Australian Attorney-General's Department

Australian Customs

Australian Federal Police (AFP)

Australian National Council on Drugs (ANCD)

Australian Institute of Criminology (AIC)

Alcohol and Other Drugs Council of Australia (ADCA)

Commonwealth Director of Public Prosecutions

National Drug and Alcohol Research Centre (NDARC)

New South Wales Police Service

Queensland Drug Squad

Queensland Ice-Breaker Taskforce

Western Australian Drug and Alcohol Office

## Appendix 2

### Written submissions

AIDS Council of New South Wales (ACON)

Australian Drug Foundation (ADF)

Australian Government Attorney-General's Department

Australian Injecting and Illicit Drug Users League

Australian Psychological Society

Convenience Advertising (CONADS)

Drug Free Australia

Drug Arm

Headspace

National Drug and Alcohol Research Centre (NDARC)

National Indigenous Drug and Alcohol Committee

Northern Territory AIDS and Hepatitis Council

Turning Point

Victorian Alcohol and Drug Association

Western Australia Attorney-General's Department

Western Australia Department of Corrective Services

Youth Substance Abuse Service

Submissions were also received from 5 members of the community

## References

- AIDS Council of New South Wales. (2006). *Crystal*. [http://www.acon.org.au/health/index.cfm?cat\\_id=103](http://www.acon.org.au/health/index.cfm?cat_id=103). AIDS Council of New South Wales.
- Ali, R., Baigent, M., Marsden, J., Montiero, M., Srisurapanont, M., Sunga, A., Vial, R., & Wada, K. (2006). *WHO Multi-Site Project on Methamphetamine-induced Psychosis: A descriptive report of findings from participating countries*. DASSA Research Monograph No. 20. South Australia: Drug & Alcohol Services South Australia.
- Allen, B. & Tresidder, J. (2003). Amphetamine type stimulants: An update on the Australian experience. *Of Substance*, 1 (1), 8-10.
- Allsop, S., Addy, D., Ask, A., Vincent, N., & Saunders, C. (1999). *From Go to Whoa: The Amphetamine Trainers Package for Health Professionals. A National Dissemination Project*. Report submitted to the Commonwealth Department of Health and Ageing. Adelaide: National Centre for Education and Training on Addiction (NCETA).
- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Psychiatric Disorders* (4<sup>th</sup> ed., text revision). Washington DC: American Psychiatric Association.
- Australian Crime Commission. (2006). *Illicit Drug Data Report 2004-05*. Canberra: Commonwealth of Australia.
- Australian Crime Commission. (2007). *Illicit Drug Data Report 2005-06*. Canberra: Commonwealth of Australia.
- Australian Federal Police. (2007). *Annual Report 2005-06*. Canberra: Commonwealth of Australia.
- Australian Institute of Criminology. (2004). Australian approaches to drug-crime diversion. *Crime Reduction Matters*, No. 23. Canberra: Australian Institute of Criminology.
- Australian Institute of Criminology. (2006). *Australian Crime: Facts and Figures*. Canberra: Australian Institute of Criminology.
- Australian Institute of Criminology. (2007a). *Facts and Figures 2006*. Canberra: Australian Institute of Criminology.
- Australian Institute of Criminology. (2007b). Global seizures of amphetamine-type stimulants. *Crime Facts Info*, No. 155. Canberra: Australian Institute of Criminology.
- Australian Institute of Health and Welfare. (2003). *Statistics on drug use in Australia 2002*. Drug Statistics Series. Canberra: Australian Institute of Health and Welfare.
- Australian Institute of Health and Welfare. (2005a). *2004 National Drug Strategy Household Survey: Detailed Findings*. Canberra, Australian Institute of Health and Welfare cat. no. PHE 66. (Drug Statistics Series No. 16).
- Australian Institute of Health and Welfare. (2005b). *Principal Diagnosis Data Cubes, Separation Statistics by Principal Diagnosis in ICD-10-AM, Australia, 1998-99 to 2003-04, Interactive National Hospital Morbidity Data*. Canberra, Australian Institute of Health and Welfare.

- Australian Institute of Health and Welfare. (2006a). *Alcohol and Other Drug Treatment Services in Australia 2004-05: Report on the National Minimum Data Set*. Drug Treatment Series no. 5. Australian Institute of Health and Welfare cat. no. HSE 43. Canberra: Australian Institute of Health and Welfare.
- Australian Institute of Health and Welfare. (2006b). *Drug use among Aboriginal and Torres Strait Islander peoples: An assessment of data sources*. Drug Statistics Series No. 17., cat no. PHE 76. Canberra: Australian Institute of Health and Welfare.
- Australian Institute of Health and Welfare. (2007). *Statistics on drug use in Australia 2006*. Drug Statistics Series. Canberra: Australian Institute of Health and Welfare.
- Australian Injecting and Illicit Drug Users League. (2006). *A Framework for Peer Education by Drug-User Organisations*.
- Australian National Council on Drugs. (2006). *Drug Use in the Family: Impacts and Implications for Children*. Australian National Council on Drugs Research Paper 13. Canberra: Australian National Council on Drugs.
- Australian National Council on Drugs (2007). *Methamphetamines: Position Paper*. Canberra: Commonwealth of Australia.
- Baker, A., Boggs, T.G., & Lewin, T.J. (2001a). Characteristics of regular amphetamine users and implications for treatment. *Drug and Alcohol Review*, 20, 49-56.
- Baker, A., Boggs, T.G., & Lewin, T.J. (2001b). Randomized controlled trial of brief cognitive-behavioural interventions among regular users of amphetamine. *Addiction*, 96, 1279-1287.
- Baker, A., & Dawe, S. (2005). Amphetamine use and co-occurring psychological problems: Review of the literature and implications for treatment. *Australian Psychologist*, 40 (2), 87-94.
- Baker, A., & Lee, N.K. (2003). A review of psychosocial interventions for amphetamine use. *Drug and Alcohol Review*, 22, 323-335.
- Baker, A., Lee, N.K., Claire, M., Lewin, T.J., Grant, T., Pohlman, S., Saunders, J.B., Kay-Lambkin, F., Constable, P., Jenner, L., Carr, V.J. (2004). Drug use patterns and mental health of regular amphetamine users during a reported 'heroin drought'. *Addiction*, 99 (7), 875-884.
- Baker, A., Lee, N.K., Claire, M., Lewin, T.J., Grant, T., Pohlman, S., Saunders, J.B., Kay-Lambkin, F., Constable, P., Jenner, L., & Carr, V.J. (2005). Brief cognitive behavioural interventions for regular amphetamine users: A step in the right direction. *Addiction*, 100, 367-278.
- Baker, A., Lee, N.K., & Jenner, L. (Eds). (2004). *Models of intervention and care for psychostimulant users* (2<sup>nd</sup> Edition). National Drug Strategy Monograph Series No. 51. Canberra: Australian Government Department of Health and Ageing.
- Baker, A., Kay-Lambkin, F., Lee, N.K., Claire, M. & Jenner, L.. (2003). *A Brief Cognitive Behavioural Intervention for Regular Amphetamine Users*. Canberra: Australian Government Department of Health and Ageing.
- Bakken, K., Landheim, A.S., & Vaglum, P. (2003). Primary and secondary substance misusers:

Do they differ in substance-induced and substance independent mental disorders?  
*Alcohol & Alcoholism*, 38, 54-59.

- Barr, A.M., Panenka, W.J., MacEwan, W., Thornton, A.E., Lang, D.J., Honer, W.G., & Lecomte, T. (2006). The need for speed: An update on methamphetamine addiction. *Journal of Psychiatry and Neuroscience*, 31 (5), 301-313.
- Battjes, R.J., Leukefeld, C.G. & Pickens, R.W. (1992). Age at first injection and HIV risk among intravenous drug users. *American Journal of Drug and Alcohol Abuse*, 18 (3), 263-273.
- Baumann, M.H., Wang, X. & Rothman, R.B. (2007). 3,4 Methylenedioxymethamphetamine (MDMA) neurotoxicity in rats: A reappraisal of past and present findings. *Psychopharmacology*, 189, 407-424.
- Beck, A.T., Steer, R.A., & Brown, G.K. (1996). *Beck Depression Inventory* (2<sup>nd</sup> Ed). New York: Psychological Corporation.
- Bell, J. (2006). The facts behind amphetamines. *InPharmation*, 7 (1), 6-11.
- Bellis, M.A., Hughes, K., & Lowey, H. (2002). Healthy nightclubs and recreational substance use: From a harm minimisation to a healthy settings approach. *Addictive Behaviors*, 27, 1025-1035.
- Benschop, A., Rabes, M., & Korf, D. J. (2002). *Pill testing, ecstasy and prevention. A scientific evaluation in three European cities*. Amsterdam: Rozenberg Publishers.
- Berg, R. (1994). *Impact Evaluation of the "Speed Wise Speed Safe" Campaign*. Paper prepared for the Drug and Alcohol Directorate, New South Wales Department of Health.
- Bertram, S., Barbir, N., Ball, J. & Carroll, T. (2003). National Illicit Drugs Campaign: Evaluation of Phase One. <http://health.gov.au/pubhlth/nidc/campaign/research.htm#evalreport>
- Black, E., Degenhardt, L. & Stafford, J. (2005). *NSW Drug Trends 2005: Findings from the Illicit Drug Reporting System*. National Drug and Alcohol Research Centre. Sydney, University of New South Wales.
- Black, E., Dolan, K. & Wodak, A. (2004). *Supply, demand and harm reduction strategies in Australian prisons*. Report prepared for the Australian National Council; on Drugs. National Drug and Alcohol centre Sydney: New South Wales.
- Boddiger, D. (2005). Methamphetamine use linked to rising HIV transmission. *Lancet*, 365, 1217-1218.
- Boot, B.P., McGregor, I.S., & Hall, W. (2000). MDMA (Ecstasy) neurotoxicity: Assessing and communicating the risks. *Lancet*, 355, 1818-1821.
- Borzyck, M. (2005). *Interventions for Prisoners Returning to the Community*. Canberra: Attorney General's Department.
- Botvin, G. J. & Griffin, K. W. (2003). Drug abuse prevention curricula in schools. In Z. Sloboda & W. J. Bukoski (Eds), *Handbook of Drug Abuse Prevention. Theory Science and Practice* (pp. 45-74). Kluwer Academic/Plenum Publishers: New York.

- Bowers, J. & Johnson, S. (2003). Measuring the geographical displacement and diffusion of benefit effects of crime prevention activity. *Journal of Quantitative Criminology*, 19 (3), 275-301.
- Boys, A., Marsden, J., Griffiths, P., Fountain, J., Stilwell, G. & Strang, J. (1999). Substance uses among young people: The relationship between perceived functions and intentions. *Addiction*, 94 (7), 1042-1050.
- Bradbeer, T.M., Fleming, P.M., Charlton, P., & Crichton, J.S. (1998). Survey of amphetamine prescribing in England and Wales. *Drug and Alcohol Review*, 17, 299-304.
- Braga A. (2005). Hot spots policing and crime prevention: a systematic review of randomized controlled trials. *Journal of Experimental Criminology*, 1 (3), 317-342.
- Brauer, L.H. & De Wit, H. (1997). High dose pimozide does not block amphetamine-induced euphoria in normal volunteers. *Pharmacology Biochemistry and Behavior*, 56 (2), 265-272.
- Brookhuis, K.A., de Waard, D., & Samyn, N. (2004). Effects of MDMA (ecstasy), and multiple drug use on (simulated) driving performance and traffic safety. *Psychopharmacology*, 173 (3-4), 440-445.
- Brown, P., Wise, R., & Kiyatkin, E. (2003). Brain hyperthermia is induced by methamphetamine and exacerbated by social interaction. *Journal of Neuroscience*, 23, 3924-3929.
- Burns, L., Mattick, R. & Cooke, M. (2006). Use of record linkage to examine illicit drug use in pregnancy. *Addiction*, 10 (6), 873-882.
- Burns, L., & Teesson, M. (2002). Alcohol use disorders comorbid with anxiety, depression and drug use disorders. Findings from the Australian National Survey of Mental Health and Well Being. *Drug and Alcohol Dependence*, 68, 299-307.
- Butler, T., Andrews, G., Allnutt, S., Sakashita, C., Smith, N.E., & Basson, J. (2006). Mental disorders in Australian prisoners: A comparison with a community sample. *Australian and New Zealand Journal of Psychiatry*, 40, 272-276.
- Buxton, N. & McConachie, N.S. (2000). Amphetamine abuse and intracranial haemorrhage. *Journal of the Royal Society of Medicine*, 93 (9), 472-477.
- Bywood, P., Pidd, K. & Roche, A. (2006). *Information and Data Sheet 5: Illicit drugs in the Australian workforce: Prevalence and patterns of use, Workplace Drug and Alcohol Use Information and Data Series*. Adelaide, South Australia: National Centre for Education and Training on Addiction, Flinders University.
- Caldicott, D.G.E., Beattie, R., & Edwards, J.W. (2005). Clandestine drug laboratories in Australia and the potential for harm. *Australian and New Zealand Journal of Public Health*, 29, 155-162.
- Camilleri, A. M., & Caldicott, D. (2005). Underground pill testing, down under. *Forensic Science International*, 151(1), 53-58.
- Cantwell, B. & McBride, A.J. (1998). Self detoxification by amphetamine dependent patients: A pilot study. *Drug and Alcohol Dependence*, 49 (2), 157-163.

- Carcach, C & Makkai, T. (2001). *Review of Victoria Police Statistics, Research and Public Policy Series*. Canberra: Australian Institute of Criminology.
- Carnwath, T., Garvey, T. & Holland, J.J. (2002). The prescription of dexamphetamine to patients with schizophrenia and amphetamine dependence. *Journal of Psychopharmacology*, 16(4), 373-377.
- Chaiken J., & Chaiken, M. (1990). Drugs and predatory crime. I M. Tonry & J. Wilson (Eds), *Drugs and Crime*. Chicago: University of Chicago Press.
- Chang, L., Cloak, C., Patterson, K. Grob, C., Miller, E.N. & Ernst, T. (2005). Enlarged striatum in abstinent methamphetamine abusers: A possible compensatory response. *Biological Psychiatry*, 57, 967-974.
- Chawla, S. (1998). 'They're synthetic. They're clandestine. They can heal. They can kill.' *UN Chronicle*, 25 (2), 34-36.
- Chen, C.K., Lin, S.K., Sham, P.C., Ball, S.D., Loh, E.W., Hsiao, C.C., Chiang, Y.L., Ree, S.C., Lee, C.H., & Murray, R.M. (2003). Pre-morbid characteristics and co-morbidity of methamphetamine users with and without psychosis. *Psychological Medicine*, 33, 1407-1414.
- Cherney, A., Juani O'Reilly, J., & Grabosky, P. (2006). The multilateralization of policing: The case of illicit synthetic drug control. *Police Practice and Research*, 7 (3), 17 -194.
- Chilvers, M., Korabelnikoff, V. & Ramsay, M. (2002). Recent trends in recorded crime and police activity in Cabramatta. *Crime and Justice Bulletin*, 7 May 2002.
- Cohen, R.S. (1998). *The Love Drug: Marching to the Beat of Ecstasy*. New York: Haworth Medical Press.
- Clemens, K.J., van Nieuwenhuyzen, P.S., Li, K.M., Cornish, J.L., Hunt, G.E., & McGregor, I.S. (2004). MDMA ("Ecstasy"), methamphetamine and their combination: Long-term changes in social interaction and neurochemistry in the rat. *Psychopharmacology*, 173, 318-325.
- Clemens, K.J., McGregor, I.S., Hunt, G.E. & Cornish, J.L. (2007). MDMA, methamphetamine and their combination: Possible lessons for party drug users from recent preclinical research. *Drug and Alcohol Review*, 26, 9-15.
- Collins, M., Dyer, K., & Fox, A. (unpublished). *Neurocognitive profiles of amphetamine and alcohol dependent patients in an outpatient clinic*.
- Conroy, A. (2006). *An overview of mental health issues in a large community sample of amphetamine users in Queensland*. Paper presented at the Australasian Amphetamines Conference; Sydney: Australia.
- Coupland, H., Ball, K., Costello, M., Harvey, B., & Maher, L. (2005). *"Something is Going to Get Us: A Consultation and Development project for a National Campaign Addressing Injecting Drug Use in Indigenous Communities*. AIVL.

- Crits-Christoph, P., Siqueland, L., Blaine, J., Frank, A., Lubursky, L., Onken, L.S., Muenz, L.R., Thase, M.E., Weiss, R.D., Gastfriend, D.R., Woody, G.E., Barber, J.P., Butler, S.F., Daley, D., Salloum, I., Bishop, S., Najavits, L.M., Lis, J., Mercer, D., Griffin, M.L., Moras, K. & Beck, A. (1999). Psychosocial treatments for cocaine dependence. *Archives of General Psychiatry*, 56(6), 493-502.
- Croft, R.J., Mackay, A.J., Mills, A.T., & Gruzelier, J.G. (2001). The relative contributions of ecstasy and cannabis to cognitive impairment. *Psychopharmacology Bulletin*, 153 (3).
- Cruickshank, C.C., Montebello, M.E., Dyer, K.R., Quigley, A., Blaszczyk, J., Tomkins, S., & Shand, D. (unpublished). *A placebo-controlled trial of mirtazepine and narrative therapy for the management of methamphetamine withdrawal*.
- Cunningham, J.K. & Liu, Lon-Mu. (2005). Impacts of federal precursor chemical regulations on methamphetamine arrests. *Addiction*, 100, 479-488.
- Curran, H.V. (2000). Is MDMA ('Ecstasy') neurotoxic in humans? An overview of evidence and of methodological problems in research. *Neuropsychobiology*, 42: 34-41.
- Darke, S., Cohen, J., Ross, J., Hando, J., & Hall, W. (1994). Transitions between routes of administration of regular amphetamine users. *Addiction*, 89, 1077-1083.
- Darke, S., Ross, J., Hando, J., Hall, W., & Degenhardt, L. (2000). *Illicit Drug Use in Australia: Epidemiology, Use Patterns and Associated Harm*. National Drug Strategy Monograph Series No. 43. Canberra: Commonwealth Department of Health and Aged Care.
- Davey, J., Davies, A., French, N., Williams, C.K. & Lang, C.P. (2005). Drug driving from a user's perspective. *Drugs: Education, Prevention and Policy*, 12, 61-70.
- Davidson, C., Gow, A.J., Lee, T.H., & Ellinwood, E.H. (2001). Methamphetamine neurotoxicity: Necrotic and apoptotic mechanisms and relevance to human abuse and treatment. *Brain Research Reviews*, 36 (1), 1-22.
- Dawe, S., & McKetin, R. (2004). The psychiatric comorbidity of psychostimulant use. In A. Baker, N.K. Lee, & L. Jenner (Eds.), *Towards Better Interventions and Care for Psychostimulant Users* (2<sup>nd</sup> ed., pp. 154-168). Canberra: Commonwealth of Australia.
- Dean, A. (2004). Pharmacology of psychostimulants. In A. Baker, N.K. Lee, & L. Jenner (Eds), *Models of Intervention and Care for Psychostimulant Users* (2<sup>nd</sup> Edition). National Drug Strategy Monograph Series No. 51. Canberra: Australian Government Department of Health and Ageing.
- Dean, A., & McGuire, T. (2004). Psychostimulant use in pregnancy and lactation. In A. Baker, N.K. Lee, & L. Jenner (Eds), *Models of Intervention and Care for Psychostimulant Users* (2<sup>nd</sup> Edition). National Drug Strategy Monograph Series No. 51. Canberra: Australian Government Department of Health and Ageing.
- Degenhardt, L. (2005). Drug use and risk behaviour among regular ecstasy users: Does sexuality make a difference? *Culture, Health & Sexuality*, 7 (6), 599-614.
- Degenhardt, L., Coffey, C., Carlin, J.B., Moran, P., & Patton, G.C. (2007a). Who are the new amphetamine users? A 10-year prospective study of young Australians. *Addiction*, 102, 1269-1279.

- Degenhardt, L., Coffey, C., Moran, P., Carlin, J.B., & Patton, G.C. (2007b). The predictors and consequences of adolescent amphetamine use: Findings from the Victoria Adolescent Health Cohort Study. *Addiction*, *102*, 1076-1084.
- Degenhardt, L., McGuigan, D., & Clayton, S. (2005). *Rapid assessment of crystal methamphetamine and GHB use in the gay, lesbian and transgender community in New South Wales*. Technical Report No. 235. Sydney: National Drug and Alcohol Research Centre.
- Degenhardt, L. & Roxburgh, A. (2007). *2005 Cocaine and Methamphetamine Related Drug-induced Deaths in Australia*. Sydney: National Drug and Alcohol Research Centre.
- Degenhardt, L., Roxburgh, A., & McKetin, R. (2007). Hospital separations for cannabis- and methamphetamine-related psychotic episodes in Australia. *Medical Journal of Australia*, *186* (7), 342-345.
- Degenhardt, L. & Topp, L. (2003). Crystal methamphetamine use among polydrug users in Sydney's dance party subculture: Characteristics, use patterns and associated harms. *International Journal of Drug Policy*, *14*, 1. 17.
- Delahunty, B. & Putt, J. (2006). The policing implications of cannabis, amphetamine and other illicit drug use in Aboriginal and Torres Strait Islander communities. *National Drug Law Enforcement Research Fund Monograph Series No. 15*. Canberra: Commonwealth of Australia.
- Department of Health and Ageing. (1999). *Illicit Drug Diversion Initiative—National Principles*. Commonwealth Government of Australia.
- Dewey, S., Schiffer, W., Lee, D., Kothari, S., Aquilina, S., Mullapudi, U. (2006). S-(+)-Gamma vinyl-GABA (S-GVG) blocks methamphetamine-induced increases in brain dopamine and 18FDG uptake in adolescent animals as well as the metabolic response to methamphetamine as adults. *Journal of Nuclear Medicine*, *47*, 11P.
- Dillon, P. (2000). 10 years of ecstasy and other party drug use in Australia: What have we done and what is there left to do? [http://www.clubhealth.org.uk/pages/2000/p2\\_p4.htm](http://www.clubhealth.org.uk/pages/2000/p2_p4.htm).
- Doak, P. (2001). *New South Wales Recorded Crime Statistics 2000*. Sydney: NSW BOCSAR.
- Dobinson, I. & Ward P. (1985). *Drugs and Crime: A survey of NSW Prison Property Offenders*. Sydney: NSW BOCSAR.
- Donovan, D.M., & Wells, E.A. (2007). 'Tweaking 12-Step': The potential role of 12-Step self-help group involvement in methamphetamine recovery. *Addiction*, *102* (Suppl 1), 121-129.
- Donovan, S.J. & Nunes, E.V. (1998). Treatment of comorbid affective and substance use disorders: Therapeutic potential of anticonvulsants. *American Journal on Addictions*, *7* (3), 210-220.
- Dowsett, G.W., Turney, L., Woodcock, G., Rance, A., & Thomson, N. (1999). *Hepatitis C prevention education for injecting drug users in Australia*. Melbourne: Australian Research Centre in Sex, Health and Society, La Trobe University.

- Drug & Alcohol Services South Australia and South Australia Police. (2006). *Guidelines for Safer Dance Parties*. Adelaide: Government of South Australia.
- Drugs and Crime Prevention Committee. (2004). *Inquiry into Amphetamine and 'Party Drug' Use in Victoria: Final Report*. Melbourne: Drugs and Crime Prevention Committee.
- Drummer, O.H., Gerostamoulos, J., Batziris, H., Chu, M., Caplehorn, J.R.M., Robertson, M.D., & Swann, P. (2003). The incidence of drugs in drivers killed in Australian road traffic crashes. *Forensic Science International*, 134, 154-162.
- Duff, C., Johnston, J., Moore, D., & Goren, N. (2007). *Dropping, Connecting, Playing and Partying: Exploring the Social and Cultural Contexts of Ecstasy and Related Drug Use in Victoria*. Melbourne: Department of Human Services, Victoria.
- Dundes, L. (2003). DanceSafe and ecstasy: protection or promotion? *Journal of Health and Social Policy*, 17, 19-37
- Dunlop, A. & Tulloch. (2007). *Stimulant treatment program: Newcastle update*. Presentation at Winter School, Brisbane.
- Dunn, M., Degenhardt, L., Campbell, G., George, J., Johnston, J., Kinner, S., Matthews, A., Newman, J., & White, N. (2007). *Australian Trends in Ecstasy and Related Drug Markets 2006: Findings from the Ecstasy and Related Drugs Reporting System (EDRS)*. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Dyer, K.R., & Cruickshank, C.C. (2005). Depression and other psychological health problems among methamphetamine dependent patients in treatment: Implications for assessment and treatment outcome. *Australian Psychologist*, 40 (2), 96-108.
- Eggert, L., Thompson, E., Herting, J., Nicholas, L. & Dicker, B. (1994). Preventing adolescent drug abuse and high school dropout through an intensive school-based social network development program. *American Journal of Health Promotion*, 8(3), 202-215.
- European Monitoring Centre for Drugs and Drug Addiction. (2001). *On-site pill testing interventions in the European Union*. Lisbon: European Monitoring Centre for Drugs and Drug Addiction.
- Enlighten. (2005). <http://www.enlighten-hr.org/testingkits.php>. Retrieved 13 December 2005.
- Feeney, G.F.X., Connor, J.P., Young, R.McD., Tucker, J., & McPherson, A. (2006). Improvement in measures of psychological distress amongst amphetamine misusers treated with brief cognitive-behavioural therapy (CBT). *Addictive Behaviors*, 31 (10), 1833-1843.
- Fennema, J.S.A., van Ameijden, E.J.C., van den Hoek, A. & Coutinho, R.A. (1997). Young and recent-onset injecting drug users are at higher risk for HIV. *Addiction*, 92 (11), 1457-1465.
- Fetherston, J & Lenton, S. (2007). *WA Drug Trends 2006: Findings from the Illicit Drug Reporting System (IDRS)*. NDARC Technical Report No. 268. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Fleming, P.M. (1998). Prescribing amphetamine to amphetamine users as a harm reduction measure. *International Journal of Drug Policy*, 9, 339-344.

- Foerster, A., Lewis, S., Owen, M., & Murray, R. (1991). Pre-morbid adjustment and personality in psychosis. Effects of sex and diagnosis. *British Journal of Psychiatry*, 158, 171-176.
- Fowler, G., Kinner, S.A., & Krenske, L. (in press). Containing ecstasy: Analytical tools for profiling an illegal drug market. NDLERF Monograph.
- Furr, C.D., Delva, J., & Anthony, J.C. (2000). The suspected association between methamphetamine ("ice") smoking and frequent episodes of alcohol intoxication: Data from the 1993 National Household Survey on Drug Abuse. *Drug and Alcohol Dependence*, 59, 89-93.
- Gonsalves, V.M., Sapp, J.L., & Huss, M.T. (2007). A comparison of methamphetamine and nonmethamphetamine users in a dual diagnosis facility. *Addiction Research and Theory*, 15 (3), 277-284.
- Gossop, M., Griffiths, P., & Strang, J. (1988). Chasing the dragon: Characteristics of heroin chasers. *British Journal of Addiction*, 83, 1159-1162.
- Gowing, L., Henry-Edwards, S., Irving, R., & Ali, R. (2001). *Ecstasy: MDMA and other ring-substituted amphetamines*. Produced for the World Health Organisation by Drugs and Alcohol Services Council (DASC); Adelaide: South Australia.
- Gowing, L.R., Henry-Edwards, S.M., Irvine, R.J., & Ali, R.L. (2002). The health effects of ecstasy: A literature review. *Drug and Alcohol Review*, 21 (1), 53-63.
- Grabowski, J., Shearer, J., Merrill, S., & Negus, S. (2004). Agonist-like, replacement and pharmacotherapy for stimulant abuse and dependence. *Addictive Behaviours*, 29, 1439-1464.
- Gray, S.D., Fatovich, D.M., McCoubrie, D.L., Daly, F.F. (2007). Amphetamine related presentations to an inner-city tertiary emergency department: A prospective evaluation. *Medical Journal of Australia*, 186, 336-339.
- Green, L (1996). *Policing Places with Drug Problems*. Thousand Oaks: Sage Publications.
- Griggs, W., Caldicott, D., Pfeiffer, J., Edwards, N., Pearce, A. & Davey, M. (2007). *The impact of drugs on road crashes, assaults and other trauma – a prospective trauma toxicology study*. National Drug Law Enforcement Research Fund (NDLERF) Monograph Series No. 20. Commonwealth of Australia.
- Gruenert, S., Ratnam, S., & Tsantefski, M. (2004). *The Nobody's Clients Project: Identifying and Addressing the Needs of Children with Substance Dependent Parents*. Victoria: Odyssey Institute of Studies, Odyssey House.
- Guillot, C., & Greenway, D. (2006). Recreational ecstasy use and depression. *Journal of Psychopharmacology*, 20 (3), 411-416.
- Gutchewsky, C. (2003). *Methamphetamine and Child Welfare*. Council Bluffs, IA: Iowa Department of Human Services.

- Halkitis, P.N., Parsons, J.T., & Stirratt, M.J. (2001). A double epidemic: Crystal methamphetamine drug use in relation to HIV transmission among gay men. *Journal of Homosexuality*, 41, 17-35.
- Hall, W., Darke, S., Ross, M. & Wodak, A. (1993). Patterns of drug use and risk-taking among injecting amphetamine and opioid users in Sydney, Australia. *Addiction*, 88(4), 509-516.
- Hall, W., Hando, J., Darke, S., & Ross, J. (1996). Psychological morbidity and route of administration among amphetamine users in Sydney, Australia. *Addiction*, 91, 81-87.
- Haller, J., Makara, G.B., & Kruk, M.R. (1998). Catecholaminergic involvement in the control of aggression: Hormones, the peripheral sympathetic, and central noradrenergic systems. *Neurosciences and Biobehavioral Reviews*, 22, 85-97.
- Hammersley, R., Khan, F., & Ditton, J. (2002). *Ecstasy and the Rise of the Chemical Generation*. London and New York: Routledge.
- Hando, J. & Hall, W. (1997). Patterns of amphetamine use in Australia. In H. Klee (Ed.), *Amphetamine Misuse: International Perspectives on Current Trends*. The Netherlands: Harwood Academic Publishers.
- Hando, J., Hall, W., Rutter, S. & Dolan, K. (1999). *Current State of Research on Illicit Drugs in Australia*. Canberra: NH&MRC.
- Hando, J., Topp, L. & Dillon, P. (1998). Ecstasy use in Sydney II: Associated harms and risk taking behaviour. In P.Dillon, L.Topp & W.Swift (Eds.), *Illicit Drugs: Current Issues and Responses. Proceedings from the Eleventh National Drug and Alcohol Research Centre Annual Symposium*. Sydney: National Drug and Alcohol Research Centre.
- Hando, J., Topp, L. & Hall, W. (1997). Amphetamine-related harms and treatment preferences of regular amphetamine users in Sydney, Australia. *Drug and Alcohol Dependence*, 46, 105-113.
- Harris, C. (2007). *Drugs and Alcohol in the Workplace*. Australian Chamber of Commerce and Industry. Issues Paper.
- Hatzipetros, T., Raudensky, J.G., Soghomonian, J., & Yamamoto, B.K. (2007). Haloperidol treatment after high-dose methamphetamine administration is excitotoxic to GABA cells in the substantia nigra pars reticulata. *Journal of Neuroscience*, 27 (22), 5895-5902.
- Hawke, J.M., Jainchill, N. & de Leon, G. (2000). Adolescent amphetamine users in treatment: Client profiles and treatment outcomes. *Journal of Psychoactive Drugs*, 32 (1), 95-105.
- Heffernan, E.B. (2006). *Methamphetamines and mental illness*. Presentation at Australasian Amphetamine Conference: Sydney, Australia.
- Heffernan, E.B., Finn, J., Saunders, J.B., & Byrne, G. (2003). Substance-use disorders and psychological distress among police detainees. *Medical Journal of Australia*, 179, 408-411.

- Hegadoren, K.M., Baker, G.B., & Bourin, M. (1999). 3,4-Methylenedioxy analogues of amphetamine: Defining the risks to humans. *Neuroscience Biobehavioural Review*, 23, 539-553.
- Henry-Edwards, S. (2001). *Psychostimulants in Australia*. Unpublished paper prepared on behalf of the National Expert Advisory Committee on Illicit Drugs.
- Herman-Stahl, M.A., Krebs, C.P., Kroutil, L.A. & Heller, D.C. (2007). Risk and protective factors for methamphetamine use and nonmedical use of prescription stimulants among young adults aged 18 to 25. *Addictive Behaviors*, 32, 1003-1015.
- Hillhouse, M.P., Marinelli-Casey, P., Gonzales, R., Ang, A., Rawson, R.A. and the Methamphetamine Treatment Project Corporate Authors. (2007). Predicting in-treatment performance and post-treatment outcomes in methamphetamine users. *Addiction*, 102 (Suppl. 1), 84-95.
- Hillier, L., de Visser, R., Kavanagh, A. & McNair, R. (2003). The association between licit and illicit drug use and sexuality in young Australian women. *Medical Journal of Australia*, 179(6), 326-327.
- Hillier, L., Turner, A. & Mitchell, A. (2005). *Writing themselves in again - six years on: the second national report on the sexuality, health and well-being of same sex attracted young people*. Melbourne: Australian Research Centre in Sex Health and Society, La Trobe University.
- Hamel, P. & Willis, K. (2007) A framework for measuring the performance of drug law enforcement. *Trends and Issues in Crime and Criminal Justice*, No. 332. Canberra: Australian Institute of Criminology.
- Horton, D.K., Berkowitz, Z., & Kaye, W.E. (2003). The acute health consequences to children exposed to hazardous substances used in illicit methamphetamine production. 1996-2001. *Journal of Child Health*, 1, 99-108.
- Hser, Y., Evans, E., Huang, Y.C. (2005). Treatment outcomes among women and men methamphetamine abusers in California. *Journal Substance Abuse Treatment*, 28, 77-85.
- Hull, P., Brown, G., Rawstorne, P., Prestage, G., Kippax, S. & Langdon, T. (2005). *Gay community Periodic Survey Perth 2004*. National Centre in HIV Social Research, National Centre in HIV Epidemiology and Clinical Research, Western Australian Centre for Health Promotion Research and Western Australia AIDS Council, National Centre in HIV Social Research.
- Hull, P., Prestage, G., Rawstorne, P., Kippax, S., Horn, G., Kennedy, M., Hussey, G. & Batrouney, C. (2006). *Gay community Periodic Survey Melbourne 2005*. National Centre in HIV Social Research, National Centre in HIV Epidemiology and Clinical Research and Victorian AIDS Council/Gay Men's Health Centre, National Centre in HIV Social Research.
- Hull, P., Rawstorne, P., Prestage, G., Crawford, J., Kippax, S., Sutherland, R., McGuigan, D. & Honnor, G. (2006a). *Sydney Gay Community Periodic Survey February 1996 to August 2005*. National Centre in HIV Social Research, National Centre in HIV Epidemiology and Clinical Research and The University of New South Wales, National Centre in HIV Social Research.

- Hull, P., Rawstorne, P., Zablotzka, I., Prestage, G., Kippax, S., Staunton, S., Harrison, G., Hakala, T., Martin, P. & O'Connor, S. (2006b). *Gay Community Periodic Survey Queensland 2005*. National Centre in HIV Social Research, National Centre in HIV Epidemiology and Clinical Research, Queensland AIDS Council and Queensland Positive People, National Centre in HIV Social Research.
- Hung, M.J., Kuo, L.T. & Cherng, W.J. (2003). Amphetamine-related acute myocardial infarction due to coronary artery spasm. *International Journal of Clinical Practice*, 57 (1), 62-64.
- Inciardi, J. & McElgrath, K. (1995). *The American Drug Scene: An Anthology*. Los Angeles CA: Roxbury Publishing Co.
- International Union of Pure and Applied Chemistry. (1993). *A Guide to IUPAC Nomenclature of Organic Compounds*. New York: Blackwell Scientific Publication.
- Irvine, G.D. & Chin, L. (1991). The environmental impact and adverse effects of the clandestine manufacture of methamphetamine. *Methamphetamine Abuse, Epidemiological Issues and Implications, Research Monograph 115*. National Institute on Drug Abuse.
- Iversen, J., Topp, L., Maher, L., Degenhardt, L., O'Brien, S. & Black, E. (2006). Drug use trends among injecting drug users: Findings from the Australian Needle and Syringe Program Survey, 2001–2005. *IDRS Drug Trends Bulletin, October 2006*. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Jenner, L., Baker, A., Whyte, I., & Carr, V. (2004a). *Management of patients with psychostimulant use problems - guidelines for general practitioners*. Canberra: Australian Government Department of Health and Ageing.
- Jenner, L., Baker, A., Whyte, I., & Carr, V. (2004b). *Psychostimulants –Management of acute behavioural disturbances. Guidelines for police services*. Canberra: Australian Government Department of Health and Ageing.
- Jenner, L., Spain, D., Whyte, I., Baker, A., Carr, V.J., & Crilly, J. (2006a). *Management of patients with psychostimulant toxicity: guidelines for ambulance services*. Canberra: Australian Government Department of Health and Ageing.
- Jenner, L., Spain, D., Whyte, I., Baker, A., Carr, V.J., & Crilly, J. (2006b). *Management of patients with psychostimulant toxicity: guidelines for emergency departments*. Canberra: Australian Government Department of Health and Ageing.
- Johnson, D. (2001). Age of illicit drug initiation. *Trends and Issues in Crime and Criminal Justice, No 201*. Canberra: Australian Institute of Criminology.
- Johnson, H. (2004). Key findings from the drug use careers of female offenders study. *Trends & Issues in Crime and Criminal Justice, No. 289*. Canberra: Australian Institute of Criminology.
- Johnston, J., Barratt, M.J., Fry, C.L., Kinner, S., Stoove, M., Degenhardt, L., George, J., Jenkinson, R., Dunn, M, & Bruno, R. (2006). A survey of regular 'ecstasy' users' knowledge and practices around determining pill content and purity: Implications for policy and practice. *International Journal of Drug Policy*, 17 (6), 464 – 472.

- Kalant, H. (2001). The pharmacology and toxicology of 'ecstasy' (MDMA) and related drugs. *Canadian Medical Association Journal*, 165 (7), 917-928.
- Kalechstein, A., Newton, T., & Green, M. (2003). Methamphetamine dependence is associated with neurocognitive impairment in the initial phases of abstinence. *Journal of Neuropsychiatry and Clinical Neuroscience*, 15, 215-220.
- Kamieniecki, G., Vincent, N., Allsop, S., & Lintzeris, N. (1998). *Models of Intervention and Care for Psychostimulant Users*. Monograph Series No. 32. NCETA.
- Kelly, E., McKetin, R., & McLaren, J. (2005). *Health service utilisation among regular amphetamine users*. Sydney: National Drug and Alcohol Research Centre.
- Kema, I.P., de Vries, E.G., & Muskiet, F.A. (2000). Clinical chemistry of serotonin and metabolites. *Journal of Chromatography B-Biomedical Applications*, 747 (1-2), 33-48.
- Kessler, R.C., Andrews, G., Colpe, L.J., Hiripi, E., Mroczek, D.K., Normand, S-L.T., Walters, E.E., & Zaslavsky, A.M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*, 32, 959-976.
- Kingswell, B. (2007). *Amphetamine Psychosis*. Presentation at Australian Winter School. Brisbane, Queensland.
- Klee, H. (1997). *Amphetamine Misuse: International Perspectives on Current Trends*. The Netherlands: Harwood Academic Publishers.
- Klee, H., Wright, S., Carnwath, T. & Merrill, J. (2001). The role of substitute therapy in the treatment of problem amphetamine use. *Drug and Alcohol Review*, 20(4), 417-429.
- Kirby, K.C., Benishek, L.A., Dugosh, K.L. & Kerwin, M.B. (2006). Substance abuse treatment providers' beliefs and objections regarding contingency management: Implications for dissemination. *Drug and Alcohol Dependence*, 85, 19-27.
- Kolecki, P. (1998). Inadvertent methamphetamine poisoning in pediatric patients. *Pediatric Emergency Care*, 14, 385-387.
- Krawczyk, C.S., Molitor, F., Ruiz, J., Facer, M., Allen, B., Green-Ajufo, B., Lynch, M., Klausner, C.S., McFarland, W., Bell-Sanford, G., Ferrero, D.V., Morrow, S., Page-Shafer, K. & Lemp, G. (2006). Methamphetamine use and HIV risk behaviors among heterosexual men – preliminary results from five northern California counties, December 2001-November 2003. *Morbidity and Mortality Weekly Report*, March 17 2006.
- Lawton, BA, Taylor, R.B. & Luongo A.J. (2005). Police officers on drug corners in Philadelphia, drug crime, and violent crime: intended, diffusion, and displacement impacts. *JQ: justice quarterly* 22:4. 427-451.
- Lee, N., Johns, L., Jenkinson, R., Johnston, J., Connolly, K., Hall, K. & Cash, R. (2007). *Clinical Treatment Guidelines for Alcohol and Drug Clinicians. No 14: Methamphetamine dependence and treatment*. Fitzroy, Victoria: Turning Point Alcohol and Drug Centre Inc.

- Leek, L., Seneque, D., & Ward, K. (2004). *Parental drug and alcohol use as a contributing factor in care and protection applications 2003*. Perth: Department for Community Development, Government of Western Australia.
- Lenne, M.G. (2007). Roadside drug testing: Unanswered questions and future challenges. *Drug and Alcohol Review*, 26, 107-108 (Editorial).
- Lineberry, T., & Bostwick, M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings*, 81, 77-84.
- London, E.D., Berman, S.M., Voytek, B., et al. (2005). Cerebral metabolic dysfunction and impaired vigilance in recently abstinent methamphetamine abusers. *Biological Psychiatry*, 57, 967-974.
- Lough, G. (1997). Law Enforcement and harm reduction: mutually exclusive or mutually compatible? *International Journal of Drug Policy*. 9. 167-75.
- Loxley, W., Toumbourou, J.W., Stockwell, T., Haines, B., Scott, K., Godfrey, C., Waters, E., Patton, G., Fordham, R., Gray, D., Marshall, J., Ryder, D., Siggers, S., Sanci, L. & Williams, J. (2004). *The Prevention of Substance Use, Risk and Harm in Australia: A Review of the Evidence*. Canberra: Commonwealth of Australia.
- Luchansky, B., Krupski, A., & Stark, K. (2007). Treatment response by primary drug of abuse: Does methamphetamine make a difference? *Journal of Substance Abuse Treatment*, 32, 89-96.
- Maglione, M., Chao, B. & Anglin, M.D. (2000). Correlates of outpatient drug treatment drop-out among methamphetamine users. *Journal of Psychoactive Drugs*, 32 (2), 221-228.
- Maher, L., Dixon, D., Lynske, M. & Hall, W. (1998). *Running the risks: Heroin, health and harm in South West Sydney*. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Makkai, T. (1999). Drug Use Monitoring in Australia (DUMA): A brief description. *Research and Public Policy Series, no. 21*. Canberra: Australian Institute of Criminology.
- Makkai, T. (2001). Statistical systems, crime statistics. In D. Featherman (Ed.), *International Encyclopedia of the Social and Behavioural Sciences: Institutions and Infrastructure*. Oxford: Pergamon.
- Makkai, T. & McGregor, K. (2002). Drugs and crime: Calculating attributable fractions from the DUMA project. In D. Collins & H. Lapsley (Eds.), *Counting the Cost: Estimates of the Social Costs of Drug Abuse in Australia in 1989-9*. Canberra: Commonwealth Department of Health and Ageing.
- Makkai, T. & McGregor, K. (2003). Drug Use Monitoring in Australia (DUMA): 2002 Annual Report on Drug Use Among Police Detainees. Canberra: Australian Institute of Criminology.
- Makkai T. & Payne J (2003). Key findings from the Drug Use Careers of Offenders (DUCO) Study. *Trends and Issues in Crime and Criminal Justice, No. 267*.

- Mattick, R. & Darke, S. (1995). Drug replacement treatments: Is amphetamine substitution a horse of a different colour? *Drug and Alcohol Review*, 14, 389-394.
- Mausbach, B.T., Semple, S.J., Strathdee, S.A., Zians, J., & Patterson, T.L. (2007). Efficacy of a behavioural intervention for increasing safer sex behaviors in HIV-positive MSM methamphetamine users: Results from the EDGE study. *Drug and Alcohol Dependence*, 87, 249-257.
- Maxwell, J.C. (2005). Emerging research on methamphetamine. *Current Opinion in Psychiatry*, 18, 235-242.
- Mayer L, Dixon, D, Lynskey, M & Hall, W. (1998). *Running the Risks: Heroin, Health and Harm in South West Sydney. Monograph No. 38*. Sydney: National Drug and Alcohol research Centre, UNSW.
- McCann, U.D., Mertl, M., Eligulashvili, V., & Ricaurte, G.A. (1999). Cognitive performance in (+/-)3,4-methylenedioxymethamphetamine (MDMA, "Ecstasy") users: A controlled study. *Psychopharmacology*, 143, 417-425.
- McDonald, J. (2003). *Peer Education: From Evidence to Practice – An Alcohol and Other Drugs Primer*. Adelaide: National Centre for Education on Training and Addiction.
- McGregor, C., Srisurapanont, M., Jittiwutikan, J., Laobhripatr, S., Wonttan, T., & White, J.M. (2005). The nature, time course and severity of methamphetamine withdrawal. *Addiction*, 100, 1320-1329.
- McIver, C., McGregor, C., Baigent, M., Spain, D., Newcombe, D., & Ali, R. (2006). *Guidelines for the Medical Management of Patients With Methamphetamine-Induced Psychosis*. South Australia: Drug and Alcohol Services South Australia.
- McKetin, R., & Kelly, E. (2007). Socio-demographic factors associated with methamphetamine treatment contact among dependent methamphetamine users in Sydney, Australia. *Drug and Alcohol Review*, 26, 161-168.
- McKetin, R., Kelly, E., Indig, D., & McLaren, J. (2004). *Characteristics of treatment provided for amphetamine use in NSW, 2002-03*. NDARC Technical Report No. 207. Sydney, NSW: National Drug and Alcohol Research Centre.
- McKetin, R., Kelly, E., & McLaren, J. (2006). The relationship between crystalline methamphetamine use and methamphetamine dependence. *Drug and Alcohol Dependence*, 85, 198-204.
- McKetin, R., & Mattick, R.P. (1997). Attention and memory in illicit amphetamine users. *Drug and Alcohol Dependence*, 48 (3), 235-242.
- McKetin, R., McLaren, J. & Kelly, E. (2005). *The Sydney Methamphetamine Market: Patterns supply, use personal harms and social consequences*. National Drug Law Enforcement Research Fund. Monograph Series no. 13, Commonwealth of Australia.

- McKetin, R., McLaren, J., Kelly, E., Hall, W., & Hickman, M. (2005). *Estimating the number of regular and dependent methamphetamine users in Australia*. National Drug and Alcohol Research Centre Technical Report no. 230, National Drug and Alcohol Research Centre, Sydney.
- McKetin, R., McLaren, J., Lubman, D.I., & Hides, L. (2006a). The prevalence of psychotic symptoms among methamphetamine users. *Addiction*, *101*, 1473-1478.
- McKetin, R., McLaren, J., Riddell, S., & Robins, L. (2006b). The relationship between methamphetamine use and violent behaviour. *Crime and Justice Bulletin*, *97*, 1-15.
- Meyer, L., & Cahill, H. (2004). *Principles for School Drug Education*. Canberra: Australian Government Department of Education, Science and Training.
- Midford, R., & Munro, G. (2006). *Drug Education in Schools: Searching for the Silver Bullet*. Melbourne: IP Communications.
- Ministerial Council on Drug Strategy. (2004). *The National Drug Strategy: Australia's Integrated Framework 2004–2009*. Commonwealth of Australia.
- Ministerial Council on Drug Strategy Joint Communique (2007). *National Leadership Forum on Ice – Compendium of Jurisdictional Achievements*. <http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/publishing.nsf/Content/mcnds-16may07-communique>
- Minnesota Department of Health. (2002). *Response to Clandestine Drug Labs*. St. Paul, MN: Minnesota Department of Health, Division of Environmental Health, Site Assessment and Consultation Unit.
- Molitor, F., Ruiz, J.D., Flynn, N., Mikanda, J.N., Sun, R.K., & Anderson, R. (1999). Methamphetamine use and sexual and injection risk behaviors among out-of-treatment injection drug users. *American Journal of Drug and Alcohol Abuse*, *25* (3), 475-493.
- Moore, D. (1992). *Recreational Drug Use, with Particular Reference to Amphetamines, Ecstasy and LSD, Amongst a Social Network of Young People in Perth, Western Australia*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology.
- Mundy, J. (2001). Methamphetamines a growing epidemic? *Connexions*, *April/May*, 2-6.
- Morgan, M.J. (2000). Ecstasy (MDMA): A review of its possible persistent psychological effects. *Psychopharmacology*, *15*, 230-248.
- Mouzos, J., Hind, H., Smith, L. & Adams, K. (2007). *Drug use monitoring in Australia 2006: Annual report on drug use among police detainees*. Canberra: Australian Institute of Criminology.
- Mouzos, J., Smith, L., & Hind, H. (2006). *Drug use monitoring in Australia: 2005 Annual report on drug use among police detainees*. Canberra: Australian Institute of Criminology.
- Murray, R. A., Doering, P. L., Boothby, L. A., Merves, M. L., McCusker, R. R., Chronister, C. W. & Goldberger, B.A. (2003). Putting an ecstasy test kit to the test: Harm reduction or harm induction? *Pharmacotherapy*, *23*(10), 1238-1244.

- National Centre for Education and Training on Addiction. (2006). *Factsheet 3 – Amphetamines and Work*. South Australia: NCETA, Flinders University.
- National Centre in HIV Epidemiology and Clinical Research. (2007). *Australian NSP Survey National Data Report 2002-2006*. Sydney: National Centre in HIV Epidemiology and Clinical Research, University of New South Wales.
- National Drug and Alcohol Research Centre. (2003). *Fact Sheet – Amphetamines*. <http://ndarc.med.unsw.edu.au/ndarc.nsf>
- National Drug Intelligence Centre. (2002). *Children At Risk: Information Bulletin*. Department of Justice, Washington, DC: National Drug Intelligence Center.
- National Institute on Drug Abuse. (1998). *Methamphetamine abuse and addiction* (Research Report Series). <http://165.112.78.61/ResearchReports/Methamph/methamph4.html>.
- National Institute on Drug Abuse. (2002). Drug abuse prevention research update. *NIDA Notes*, 16(6). [http://www.drugabuse.gov?NIDA\\_Notes?NNVol16N16/Conference.htm](http://www.drugabuse.gov?NIDA_Notes?NNVol16N16/Conference.htm)
- National Leadership Forum on Ice. (2006). International and national trends, prevalence and impacts – who uses ice – what are its effects – the evidence base. *Paper prepared for National Leadership Forum on Ice*. Sydney: Radison Hotel.
- Neaigus, A., Miller, M., Friedman, S.R., Hagen, D.L., Sifaneck, S.J., Ildefonso, G., et al. (2001). Potential risk factors for the transition to injecting among non-injecting heroin users: A comparison of former injectors and never injectors. *Addiction*, 96 (6), 847-860.
- New South Wales Department of Corrective Services. Compulsory Drug Treatment Correctional Centre. [http://www.dcs.nsw.gov.au/offender\\_management/offender\\_management\\_in\\_custody/correctional\\_centres/compdrug.asp](http://www.dcs.nsw.gov.au/offender_management/offender_management_in_custody/correctional_centres/compdrug.asp) (accessed 12 September 2007).
- New South Wales Justice Health Service (2005). *Our services: Drug and alcohol*. [http://www.justicehealth.nsw.gov.au/services/drug\\_and\\_alcohol.html](http://www.justicehealth.nsw.gov.au/services/drug_and_alcohol.html) (accessed 12 September 2007).
- Newton, T.F, Kalechstein, A.D, Duran, S., Vansluis, N. & Ling, W. (2004). Methamphetamine abstinence syndrome: Preliminary findings. *American Journal of Addiction*, 13, 248-255.
- Newton, T.F., Roache, J.D., De La Garza, R., Fong, T., Wallace, C.L., Li, S.H. et al. (2006). Bupropion reduces methamphetamine-induced subjective effects and cue-induced craving. *Neuropsychopharmacology*, 31, 1537-1544.
- Nicholas, R., & Shoobridge, J. (2005). *Alcohol and other drug issues facing policing in Australia*. Adelaide: Australasian Centre for Policing Research. Report produced on behalf of the Commissioners' Drugs Committee.
- Nordahl, T.E., Salo, R., & Leamon, M. (2003). Neuropsychological effects of chronic methamphetamine use on neurotransmitters and cognition: A review. *Journal of Neuropsychiatry and Clinical Neurosciences*, 15, 317-325.
- NSW Health. (2005). *Amphetamine, 'Ecstasy' and Cocaine: A Prevention and Treatment Plan 2005-2009*. North Sydney, NSW: NSW Department of Health.

- NSW Health (2006). *Psychostimulant Users – Clinical Guidelines for Assessment and Management*. North Sydney, NSW: NSW Department of Health.
- Nicholas, R. (2003). *The use of amphetamine type stimulants by offenders involved in high speed pursuits*. A discussion paper prepared for the Commissioners' Drugs Committee of the Conference of Police Commissioners of Australasia and the South West Pacific Region by the Australasian Centre for Policing Research.
- Nicholas, R., & Shoobridge, J. (2005). *Alcohol and other drug issues facing policing in Australia*. Report produced on behalf of the Commissioners' Drugs Committee, Adelaide: Australasian Centre for Policing Research.
- Nurco, D., Kinlock, T. & Hanlon T. (1995). The drugs-crime connection. In J. Inciardi & K. McElgrath (Eds.), *The American Drug Scene: An Anthology*. Los Angeles CA: Roxbury Publishing Co.
- Nutting, A., Lee, N.K., Jenner, L. & Davies, J. (unpublished). The prevalence of mental health disorders among clients in substance use treatment. Cited in 2004 Drugs and Crime Prevention Committee (DCPC; Eds), *Inquiry into Amphetamine and 'Party Drug' Use in Victoria: Final Report*. Melbourne, Victoria: DCPC.
- O'Brien, S., Black, E., Degenhardt, L., Roxburgh, A., Campbell, G., de Graaff, B., Fetherston, J., Jenkinson, R., Kinner, S., Moon, C., & White, N. (2007). *Australian Drug Trends 2006: Findings from the Illicit Drug Reporting System (IDRS)*. NDARC Monograph No. 60. Sydney: University of New South Wales.
- Palmgreen, P. & Donohew, L. (2003). Effective mass media strategies for drug abuse prevention campaigns. In Z. Sloboda & W. J. Bukoski (Eds.), *Handbook of Drug Abuse Prevention: Theory, Science and Practice* (p. 27-43). New York: Kluwer Academic/Plenum Publishers.
- Parker, H., Bakx, K., & Newcombe, R. (1988). *Living With Heroin*. Milton Keynes: Open University Press.
- Parliamentary Joint Committee on the Australian Crime Commission. (2007). *Inquiry into the Manufacture, Importation and use of Amphetamines and Other Synthetic Drugs (AOSD)*. Commonwealth of Australia.
- Parrott, A.C., Lees, A., Garnham, N.J., Jones, M., & Wesnes, K. (1998). Cognitive performance in recreational users of MDMA or Ecstasy – evidence for memory deficits. *Journal of Psychopharmacology*, 12, 79-83.
- Parrott, A.C. (2006). MDMA in humans: Factors which affect the neuropsychobiological profiles of recreational ecstasy users, the integrative role of bioenergetic stress. *Journal of Psychopharmacology*, 20, 147-163.
- Patton, N. (2003). *Parental Drug Use – The Bigger Picture: A Review of the Literature*. Melbourne: The Mirabel Foundation.
- Payne, J., Kwiatkowski, M. & Wundersitz, J. (2007). *Police drug diversion: a study of criminal offending outcomes*. Unpublished report to the Australian Government Department of Health and Welfare (DoHA), June 2007. Canberra: Australian Institute of Criminology.

- Pead, J., Lintzeris, N. & Churchill, A. (1996). *From go to whoa: Amphetamines and analogues, the trainer's package for health professionals*. Canberra: Commonwealth Department of Health and Human Services, AGPS.
- Penrose-Wall, J., Baume, P. & Martin, G. (1999). *Achieving the Balance: A Resource Kit for Australian Media Professionals for the Reporting and Portrayal of Suicide and Mental Illnesses*. Canberra: Commonwealth of Australia.
- Pernanen, K., Cousineau, M., Brochu, S. & Sun, F. (2002). *Proportions of crimes associated with alcohol and other drugs in Canada*. Toronto: Canadian Centre on Substance Abuse.
- Peroutka, S.J., Newman, H. & Harris, H. (1988). Subjective effects of 3,4-methylenedioxymethamphetamine in recreational users. *Neuropsychopharmacology*, 1(4), 273-277.
- Plessinger, M.A. (1998). Prenatal exposure to amphetamines. Risks and adverse outcomes in pregnancy. *Obstet Gynecol Clin North America*, 25, 119-138.
- Prichard, J. & Payne, J. (2005). Alcohol, drugs and crime : A study of juveniles in detention. *Research and Public Policy Series, no. 67*. Canberra: Australian Institute of Criminology:
- Pubill, D., Canudas, A.M., Pallas, M., Camins, A., Camarasa, J. & Escubedo, E. (2003). Different glial response to methamphetamine- and methylenedioxymethamphetamine-induced neurotoxicity. *Naunyn Schmiedebergs Archives Pharmacology*, 367, 490-499.
- Putt, J., Payne J. & Milner, L. (2005). Indigenous male offending and substance abuse. *Trends & Issues in Crime and Criminal Justice, No. 293*. Canberra: Australian Institute of Criminology.
- Quinlan, M. (2001). *Report of Inquiry into Safety in the Long Haul Trucking Industry*. Sydney, NSW: Motor Accidents Authority of New South Wales.
- Ratcliffe, J. & Makkai, T. (2004): Diffusion of benefits: Evaluating a policing operation. *Trends & Issues in Crime and Criminal Justice, No. 278*. Canberra: Australian Institute of Criminology.
- Rawson, R.A. (1999). *Treatment for Stimulant Use Disorders* (Treatment Improvement Protocol (TIP) Series No.33). Rockville, Maryland: US Department of Health and Human Services.
- Rawson, R.A., Gonzales, R., McCann, M. & Ling, W. (2007). Use of methamphetamine by young people: Is there reason for concern? *Addiction*, 102 (7), 1021-1022.
- Rawson, R.A., Marinelli-Casey, P., Anglin, M.D., Dickow, A., Frazier, Y., Gallagher, C., Galloway, G.P., Herrell, J., Huber, A., McCann, M.J., Obert, J., Pennell, S., Reiber, C., Vandersloot, D., Zweben, J. & the Methamphetamine Treatment Project Corporate Authors. (2004). A multi-site comparison of psychosocial approaches for the treatment of methamphetamine dependence. *Addiction*, 99. 708-717.
- Reback, C.J. (1997). *The Social Construction of a Gay Drug: Methamphetamine use Among Gay and Bisexual Males in Los Angeles*. Los Angeles: City of Los Angeles.

- Ressler, K.J., & Nemeroff, C.B. (1999). Role of norepinephrine in the pathophysiology and treatment of mood disorders. *Biological Psychiatry*, 46 (9), 1219-1233.
- Riley, S.C.E., James, C., Gregory, D., Dingle, H., & Cadger, M. (2001). Patterns of recreational drug use at dance events in Edinburgh, Scotland. *Addiction*, 96 (7), 1035-1047.
- Ritter, A. (2005). A review of approaches to studying illicit drug markets. Drug policy modelling project. *Monograph 08*. Melbourne: Turning Point Alcohol and Drug Centre.
- Roche, A.M. (2007). AOD use by Australian workers: A risky mix. *Of Substance*, 5 (2).
- Rogers, R.D., Everitt, B.J., Baldacchino, A., Blackshaw, A.J., Swainson, R., Wynne, K., Baker, N.B., Hunter, J., Carthy, T., Booker, E., London, M., Deakin, J.F., Sahakian, B.J. & Robbins, T.W. (1999). Dissociable deficits in the decision-making cognition of chronic amphetamine abusers, opiate abusers, patients with focal damage to prefrontal cortex, and tryptophan-depleted normal volunteers: Evidence for monoaminergic mechanisms. *Neuropsychopharmacology*, 20 (4), 322-339.
- Roiser, J.P., & Sahakian, B.J. (2004). Relationship between ecstasy use and depression: A study controlling for poly-drug use. *Psychopharmacology*, 173 (3-4), 411-417.
- Roll, J.M. (2007). Contingency management: An evidence-based component of methamphetamine use disorder treatments. *Addiction*, 102 (Suppl 1), 114-120.
- Roll, J.M., Petry, N.M., Stitzer, M.L., Brecht, M.L., Peirce, J.M., McCann, M.J., & Blaine, J. (2006). Contingency management for the treatment of methamphetamine use disorders. *American Journal of Psychiatry*, 163 (11), 1993-1999.
- Ross, J. (2007). *Illicit Drug Use in Australia: Epidemiology, Use Patterns and Associated Harm* (2<sup>nd</sup> edition). Sydney: National Drug & Alcohol Research Centre, University of New South Wales.
- Roth, L. (2006). Law and order legislation in the Australian States and Territories: 2003–2006. Briefing Paper 12/2006. NSW: Parliamentary Library Research Service.
- Rothman, R.B. & Baumann, M.H. (2003). Monoamine transporters and psychostimulant drugs. *European Journal of Pharmacology*, 479, 23-40.
- Salo, R., Nordahl, T.E., Possin, K., Leamon, M., Gibson, D.R., Galloway, G.P., Flynn, N.M., Henik, A., Pfefferbaum, A. & Sullivan, E.V. (2002). Preliminary evidence of reduced cognitive inhibition in methamphetamine-dependent individuals. *Psychiatry Research*, 111, 65-74.
- Sansom, D. (2001). *Education and Training, National Hepatitis C Resource Manual*. Melbourne: Department of Health and Aged Care and Australian Institute of Primary Care, La Trobe University.
- Schifano, F. (2003). A bitter pill. Overview of ecstasy (MDMA, MDA) related fatalities. *Psychopharmacology*, 173 (3-4), 242-248.

- Schifano, F., Oyefeso, A., Corkery, J., Cobain, R., Jambert-Gray, R., Martinotti, G., & Ghodes, A.H. (2003). Death rates from ecstasy (MDMA, MDA) and polydrug use in England and Wales 1996-2002. *Human Psychopharmacology*, 18 (7), 519-524.
- Schloenhardt, A. (2007). The market for amphetamine-type stimulants and their precursors in Oceania. *Research in Public Policy Series* no 81 Canberra: Australian Institute of Criminology.
- Sekine, Y., Ouchi, Y., Takei, N., Yoshikawa, E., Nakamura, K., Futatsubashi, M., Okada, H., Minabe, Y., Suzuki, K., Iwata, Y., Tsuchiya, K.J., Tsukada, H., Iyo, M. & Mori, N. (2006). Brain serotonin transporter density and aggression in abstinent methamphetamine abusers. *Archives of General Psychiatry*, 63, 90-100.
- Semple, S.J., Patterson, T.L., & Grant, I. (2004). The context of sexual risk behaviour among heterosexual methamphetamine users. *Addictive Behaviors*, 29, 807-810.
- Seymour, J. (1988). *Dealing With Young Offenders*. Law Book Company, North Ryde, 1988.
- Shearer, J. (2007). Psychosocial approaches to psychostimulant dependence: A systematic review. *Journal of Substance Abuse Treatment*, 32, 41-52.
- Shearer, J., & Gowing, L.R. (2004). Pharmacotherapies for problematic psychostimulant use: A review of current research. *Drug and Alcohol Review*, 23, 203-211.
- Shearer, J., Sherman, J., Wodak, A., & van Beek, I. (2002). Substitution therapy for amphetamine users. *Drug and Alcohol Review*, 21, 179-185.
- Shearer, J., Wodak, A., Mattick, R.P., et al. (2001). Pilot randomised controlled study of dexamphetamine for amphetamine dependence. *Addiction*, 96, 1289-1296.
- Sheridan, J., Bennett, S., Coggan, C., Wheeler, A., & McMillan, K. (2006). Injury associated with methamphetamine use: A review of the literature. *Harm Reduction Journal*, 3.
- Shewan, D., Dalgarno, P., & Reith, G. (2000). Perceived risk and risk reduction among ecstasy users: The role of drug, set, and setting. *International Journal of Drug Policy*, 10, 431-453.
- Shoptaw, S., Huber, A., Peck, J., Yang, X., Liu, J., Dang, J., Roll, J., Shapiro, B., Rotheram-Fuller, E. & Ling, W. (2006). Randomised, placebo-controlled trial of sertraline and contingency management for the treatment of methamphetamine dependence. *Drug and Alcohol Dependence*, 85, 12-18.
- Shoptaw, S., & Reback, C.J. (2007). Methamphetamine use and infectious disease related behaviors in men who have sex with men: Implications for interventions. *Addiction*, Vol. 102 (Suppl 1), 130-135.
- Shoptaw, S., Reback, C.J., Peck, J.A., Yang, X., Rotheram-Fuller, E., Larkins, S. Veniegas, R.C., Freese, T.E. & Hucks-Ortiz, C. (2005). Behavioral treatment approaches for methamphetamine dependence and HIV-related sexual risk behaviors among urban gay and bisexual men. *Drug and Alcohol Dependence*, 78, 125-134.

- Small, W., Kerr, T., Charette, J., Schechter, M.T. & Spittal, P.M. (2006). Impacts of intensified police activity on injection drug users: evidence from an ethnographic investigation. *International Journal of Drug Policy*, 17 (2), 85-95.
- Smith, H.G. (1993). Intervention strategies for children vulnerable for school failure due to exposure to drugs and alcohol. *International Journal of Addiction*, 28, 1435-1470.
- Smith, L. (forthcoming). Amphetamine-type stimulants and violent crime. *Trends & Issues in Crime and Criminal Justice*. Canberra: Australian Institute of Criminology.
- Smith, L., Yonekura, M.L., Wallace, T., Berman, N., Kuo, J. & Berkowitz, C. (2003). Effects of prenatal methamphetamine exposure on fetal growth and drug withdrawal symptoms in infants born at term. *Journal of Developmental Behavioural Paediatrics*, 24, 17-23.
- Spoth, R. L., Clair, S., Shin, C., & Redmond, C. (2006). Long-term effects of universal preventive interventions on methamphetamine use among adolescents. *Archives of Pediatric and Adolescent Medicine*, 160, 876-882.
- Spruit, I. P. (2001). Monitoring synthetic drug markets, trends, and public health. *Substance Use and Misuse*, 36(1-2), 23-47.
- Soar, K., Turner, J.J., & Parrott, A.C. (2006). Problematic versus non-problematic ecstasy/MDMA use: The influence of drug usage patterns and pre-existing psychiatric factors. *Journal of Psychopharmacology*, 20 (3), 417-424.
- Sommers, I., & Baskin, D. (2006). Methamphetamine use and violence. *Journal of Drug Issues*, 36, 77-96.
- Srisurapanont, M., Ali, R., Marsden, J., Sunga, A., Wada, K., & Monteiro, M. (2003). Psychotic symptoms in methamphetamine psychotic in-patients. *International Journal of Neuropsychopharmacology*, 6, 347-352.
- Srisurapanont, M., Jarusuraisin, N., & Kittirattanapaiboon, P. (2001). Treatment for amphetamine dependence and abuse. In: *The Cochrane Library, Issue 4*. Oxford: Update Software.
- Srisurapanont, M., Sombatmai, S., & Boripuntakul, T. (2007). Brief Intervention for students with methamphetamine use disorders: A randomized controlled trial. *American Journal on Addictions*, 16, 111-116.
- Steering Committee for the Review of Government Service Provision. (2006). *Report on Government Services*. Melbourne: Productivity Commission.
- Strang, J., Des Jarlais, D.C., Griffiths, P., & Gossop, M. (1992). The study of transitions in the route of drug use: The route from one route to another. *British Journal of Addiction*, 87, 473-483.
- Stubbs, M., Hides, L., Howard, J., & Arcuri, A. (2004). Psychostimulants and young people. In A. Baker, N.K. Lee, & L. Jenner (Eds), *Models of Intervention and Care for Psychostimulant Users* (2<sup>nd</sup> Edition). National Drug Strategy Monograph Series No. 51. Canberra: Australian Government Department of Health and Ageing.

- Substance Abuse and Mental Health Services Administration. (2003). *Substance abuse prevention programs reduce high-risk youth drug use*. [http://www.stopgettingsick.com/templates/news\\_templates.cfm?id=4906](http://www.stopgettingsick.com/templates/news_templates.cfm?id=4906)
- Sumnall, H.R., & Cole, J.C. (2005). Self-reported depressive symptomatology in community samples of polysubstance misusers who report ecstasy use: A meta-analysis. *Journal of Psychopharmacology*, 19 (1), 84-92.
- Tancer, M.E. & Johanson, C.E. (2001). The subjective effects of MDMA and mCPP in moderate MDMA users. *Drug and Alcohol Dependence*, 65(1), 97-101.
- Taylor, W.A., & Gold, M.S. (1990). Pharmacologic approaches to the treatment of cocaine dependence. *Western Journal of Medicine*, 152, 573-577.
- Ted Noffs Foundation. PALM Program. <http://www.noffs.org.au/programs/palm.shtm>.
- Thomasius, R., Zapletalova, P., Petersen, K. et al. (2006). Mood, cognition and serotonin transporter availability in current and former ecstasy (MDMA) users: The longitudinal perspective. *Journal of Psychopharmacology*, 20, 211-225.
- Thompson, P.M., Hayashi, K.M., Simon, S.L. et al. (2004). Structural abnormalities in the brains of human subjects who use methamphetamine. *Journal of Neuroscience*, 24, 6028-6036.
- Tiihonen, J., Kuoppasalmi, K., Fohr, J., Tuomola, P., Kuikanmaki, O., Vormaa, H., Sokero, P., Haukka, J., & Meririnne, E. (2007). A comparison of aripiprazole, methylphenidate, and placebo for amphetamine dependence. *The American Journal of Psychiatry*, 164 (1), 160-162.
- Topp, L., Degenhardt, L., Kaye, S. & Darke, S. (2002). The emergence of potent forms of methamphetamine in Sydney, Australia: A case study of the IDRS as a strategic early warning system. *Drug and Alcohol Review*, 21 (4), 341-348.
- Trewin, D. (2006a). *National Aboriginal and Torres Strait Islander Health Survey 2004-05*. ABS Catalogue No. 4715.0. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- Trewin, D. (2006b). *2006 Prisoners in Australia*. Australian Bureau of Statistics, Catalogue No. 5417.0. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- Turner, J.J.D & Parrot, A.C. (2000). 'Is MDMA a human neurotoxin: Diverse views from the discussants. *Neuropsychobiology*, 42, 42-48.
- Turnipseed, S., Richards, J., Kirk, J, et al. (2003). Frequency of acute coronary syndrome in patients presenting to the emergency department with chest pain after methamphetamine use. *Journal of Emergency Medicine*, 24, 369-373.
- Tyler, A. (1986). *Street Drugs*. Great Britain: Hodder & Stoughton.
- Tzschentke, T.M. (2001). Pharmacology and behavioural pharmacology of the mesocortical dopamine system. *Progress in Neurobiology*, 63 (3), 241-320.
- United Nations Drug Control Programme. (1996). *Amphetamine-Type Stimulants: A Global Review*. Vienna: UNDCP/TS6.

- United Nations Office for Drug Control and Crime Prevention. (2001). *World Drug Report 2000*. Oxford: Oxford University Press.
- United Nations Office on Drugs and Crime. (2006). *2006 World Drug Report*. Vienna: United Nations Office on Drugs and Crime.
- United Nations Office on Drugs and Crime. (2007). *2007 World Drug Report*. Vienna: United Nations Office on Drugs and Crime.
- van de Wijngaart, G. F., Braam, R., de Bruin, D., Fris, M., Maalste, N. J. M., & Verbraeck, H. T. (1999). Ecstasy use at large-scale dance events in the Netherlands. *Journal of Drug Issues*, 29(3), 679-702.
- Vincent, N., Shoobridge, J., Ask, A., Allsop, S. & Ali, R. (1999). *Characteristics of amphetamine users seeking information, help and treatment in Adelaide*. South Australia: South Australia National Centre for Education and Training on Addiction, Flinders University.
- VIVAIDS. (2005). *RaveSafe Survey*. In collaboration with the Centre for Youth Drug Studies. Melbourne, Victoria.
- Vocci, F.J. & Appel, N.M. (2007). Approaches to the development of medications for the treatment of methamphetamine dependence. *Addiction*, 102 (Suppl 1), 96-106.
- Volkow, N.D., Chang, L., Wang, G.J., Fowler, J.S., Franceschi, D., Sedler, M., et al. (2001). Loss of dopamine transporters in methamphetamine abusers recovers with protracted abstinence. *Journal of Neuroscience*, 21, 9414-9418.
- Weatherburn, D. & Lind, B. (1999). Heroin harm minimisation: Do we really have to choose between law enforcement and treatment? *Crime and Justice Bulletin*, No. 46. Sydney: NSW Bureau of Crime Statistics and Research.
- Weatherburn, D., Lind, B. & Forsythe L. (1999). *Drug Law Enforcement: Its effect on Treatment and Injection Practices*. Sydney: NSW Bureau of Crime Statistics and Research.
- Weatherburn, D., Jones, C., Freeman, K. & Makkai, T. (2003). Supply control and harm reduction: Lessons from the Australian heroin 'drought'. *Addiction*, 98, 83-91.
- Weisburd, D., Wyckoff, L.A., Ready, J., Eck, J.E., Hinkle, J.C. & Gajewski, F. (2006). Does crime just move around the corner? A controlled study of spatial displacement and diffusion of crime control benefits. *Criminology*, 44 (3), 549-591.
- White, P., Chant, D., Whiteford, H. (2006). A comparison of Australian men with psychotic disorders remanded for criminal offences and a community group of psychotic men who have not offended. *Australian and New Zealand Journal of Psychiatry*, 40, 260-265.
- White, R. (2000). Dexamphetamine substitution in the treatment of amphetamine abuse: An initial investigation. *Addiction*, 95 (2), 229-238.
- White, V., & Hayman, J. (2006). *Australian secondary school students' use of over the-counter and illicit substances in 2005*. National Drug Strategy.
- Wilczynski, A. & Pigott, R. (2004). *The relationship between drugs and crime. Australia*. Attorney-General's Department.

- Wilkins, C., Pledger, M., Lee, A., Adams, R. & Rose, E. (2004). *A local pilot of the New Zealand Arrestee Drug Abuse Monitoring (NZ-ADAM) System*. Auckland: Massey University.
- Willens, T.E., Biederman, J., Kiely, K., Bredin, E., Lic, S.W., & Spencer, T.J. (1995). Pilot study of behavioural and emotional disturbances in the high-risk children of parents with opioid dependence. *Journal of American Academy of Child Adolescent Psychiatry*, 34, 779-785.
- Williamson, A., Colley, M., Hayes, L. & O'Neill, L. (2006). *Final report of stimulant use by long distance road transport drivers project*. NSW Injury Risk Management Research Centre, University of New South Wales, Injury Risk Management Research Centre.
- Winstock, A.R., Wolff, K., & Ramsey, J. (2001). Ecstasy pill testing: Harm minimisation gone too far? *Addiction*, 96 (8), 1139-1148.
- World Health Organisation. (1997). *Amphetamine-Type Stimulants: A report from the WHO Meeting on Amphetamines, MDMA and other Psychostimulants*. Geneva, 12-15 November 1996. Geneva: Division of Mental Health and Prevention of Substance Abuse, World Health Organisation.
- Worth, H. & Rawstone, P. (2005). Crystallising the HIV epidemic: Methamphetamine, unsafe sex, and gay diseases of the will. *Archives of Sexual Behaviour*, 34, 483-486.
- Wright, S., & Klee, H. (2001). Violent crime, aggression and amphetamine: What are the implications for drug treatment services? *Drugs: Education, Prevention and Policy*, 8, 73-90.
- Wright, S., Klee, H., & Reid, P. (1999). Attitudes of amphetamine users towards treatment services. *Drugs: Education, Prevention, and Policy*, 6, 71-86.
- Zablotska, I., Prestage, G., Hull, P., Crawford, J., Kippax, S., Sutherland, R., Corrigan, N. & Honnor, G. (2006). *Sydney Gay Community Periodic Survey, February 1996 to February 2006*. National Centre in HIV Social Research, National Centre in HIV Epidemiology and Clinical Research and The University of New South Wales, National Centre in HIV Social Research.
- Zule, W. & Desmond, D. (1999). An ethnographic comparison of HIV risk behaviours among heroin and methamphetamine injectors. *American Journal of Drug and Alcohol Abuse*, 25(1), 1-22.
- Zweben, J.E., Cohen, J.B., Christian, D., Galloway, G.P., Salinardi, M., Parent, D. & Iguchi, M for the Methamphetamine Treatment Project. (2004). Methamphetamine Treatment Project. Psychiatric symptoms in methamphetamine users. *American Journal on Addictions*, 13, 181-190.







