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**Suggested citation: Quinn, C., Black, E., Dunn, M. & Degenhardt, L. (2008). *Methylamphetamine in Victoria 2004-2007: Forms and purity. Ecstasy and Related Drug Trends Bulletin, April 2008. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.***

**The Ecstasy and Related Drugs Reporting System is funded by the Australian Government Department of Health and Ageing**

## Key findings

- Data from the Chemical Drugs Intelligence Database indicate that methylamphetamine powder (speed) predominates in the Victorian methylamphetamine market, accounting for an overall average 55% of all seizures between 2004 and 2007.
- Other forms of this drug in Victoria include methylamphetamine base (base), crystalline methylamphetamine (ice/crystal) and methylamphetamine tablets, the latter typically being sold as ecstasy.
- In 2007, tablets remained the lowest purity form, with an average purity of less than 10% between 2004 and 2007. The proportion of methylamphetamine seizures accounted for by the ice/crystal form increased between 2004 and 2007; the average purity of this form decreased from 52% in 2004 to 32% in 2007.
- Between 2004 and 2007, there appeared to be no association between methylamphetamine forms and cutting agents used. Adulterants included sugars, caffeine, MSM and pharmaceuticals such as paracetamol and ephedrine; substantial proportions were unidentified.
- There are risks associated with the use of a substance with unproven content and purity. Clarification and dissemination of these findings, including the different forms and purities, is recommended to ensure that public health and education messages are credible and effective.
- The situation in Victoria is unique in that all seizures are analysed. This provides a more comprehensive evidence base that can be used to inform policy than is currently available in other states and territories. Wider implementation of this approach across all jurisdictions is recommended.

## Methylamphetamine in Victoria 2004–2007: Forms and purity

### Introduction

Data collected from the Australian general population suggest that, in 2004, almost one in ten (9.1%) Australians reported having ever used methylamphetamine<sup>1</sup>, with use in the past year reported by 3.2% of the Australian general population<sup>[1]</sup>. Trends in the prevalence of use among secondary school students have followed a similar pattern<sup>[2]</sup>. Among sentinel groups of drug users, interviewed as part of the IDRS and EDRS (people who regularly inject drugs and regular ecstasy users, respectively), data suggest that the overall proportion reporting any methylamphetamine use has remained stable across time<sup>[3,4]</sup>.

There have been several notable changes in the illicit market for methylamphetamine in Australia in recent years. Firstly, methylamphetamine (also known as methamphetamine) has replaced amphetamine as the predominant form of this drug. Amphetamine sulphate was the most available form of illicit amphetamine in Australia in the 1980s<sup>[5]</sup>; however, throughout the 1990s the proportion of seizures of amphetamines that were methylamphetamine increased, such that methylamphetamine began to dominate the market<sup>[6]</sup> and has continued to do so<sup>[7]</sup>.

Secondly, there has been the emergence of the more potent forms of methylamphetamine, in particular the higher purity crystalline form ('crystal' or 'ice'). Australia's drug monitoring systems have documented the emergence and subsequent trends in the use of these potent forms of methylamphetamine at a national level since 1998 (IDRS<sup>[8]</sup>) and 2003 (EDRS<sup>[9]</sup>), respectively.

Distinction is made between different forms of methylamphetamine, typically based on the appearance and perceived purity. Previous work has identified three main forms of methylamphetamine: powder ('speed'), base ('base', 'paste', 'pure'), and crystalline methylamphetamine ('crystal', 'ice', 'shabu'), in addition to a tablet form typically sold as ecstasy<sup>[10,11]</sup>. Street terminology used to distinguish the different forms has been found to be reasonably accurate, in particular for ice/crystal<sup>[11]</sup>.

The distinction between these forms appears to be important. Key experts (KE) interviewed as part of the 2007 NSW EDRS suggest that there is stigma attached to the more potent base and ice/crystal forms, but not the powdered speed form of methylamphetamine. These KE suggested that, while users were aware that speed and ice/crystal are different forms of the same drug, the lower purity meant

that there was more social acceptance of speed use than of the more potent forms<sup>[12]</sup>. However, some KE from the 2007 Victorian EDRS suggested that reports of ice/crystal use in that state may be overestimated, with one KE suggesting that many users were unable to distinguish between the forms of methylamphetamine and were inclined to report ice/crystal use due to increased media focus<sup>[13]</sup>.

The forms and purity of methylamphetamine are of particular importance when considering harms associated with use. For example, route of administration is important – some forms lend themselves to intranasal use, others to smoking and/or injecting. Among sentinel groups of regular ecstasy users, crystalline methylamphetamine smoking has increased markedly and has been found to be associated with significant harms<sup>[14]</sup>. In addition, harms associated with methylamphetamine (such as greater injection risk behaviours and more extensive criminal activity) have been found to be particularly prevalent among people who regularly injecting drugs<sup>[15]</sup>. Other issues which need to be considered include increased tolerance, which may lead some users of the drug to graduate to using either more potent forms or using routes of administration that may place them at an increased risk of blood-borne viral transmission<sup>[see 16 for discussion]</sup>. Increased use of the more potent form may also lead to increased problems such as dependence<sup>[17]</sup>. Given possible changes in the market over time, the aim of the current bulletin was to update previous work investigating methylamphetamine forms and purity using Victorian seizure data.

## Methylamphetamine in Victoria

Data taken from the Victoria Police Forensic Services' Chemical Drugs Intelligence Database demonstrate that methylamphetamine accounted for an average of one third of illicit powder or tablet seizures made in Victoria (excludes no drug powders) between 2004 and 2007 (Table 1).

**Table 1: Comparison drug types from powder/tablet seizures by percentage weight of seizures, 2004-2007**

	2004	2005	2006	2007
% MDMA (ecstasy)	26	60	45	47
% methylamphetamine (speed)	53	26	27	26
% heroin	15	10	23	7
% cocaine	1	1	1	11
% ketamine	4	3	4	9

*Note: 2007 data complete to approximately August 2007*

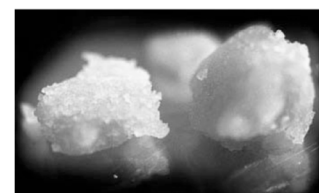
## Appearance

As discussed earlier, several forms of methylamphetamine have been identified in Australia and are reflected in the Chemical Drugs Intelligence Database. However, even within these classifications, there may be wide variation. For example, 'powder' seizures may range from a fine free flowing powder through to a more coarse or granulated powder form. Pictures commonly identified as being of speed powder, base and ice/crystal are shown<sup>[11, 16]</sup>.

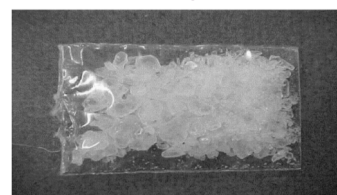
**Speed powder**



**Base**



**Ice/crystal**

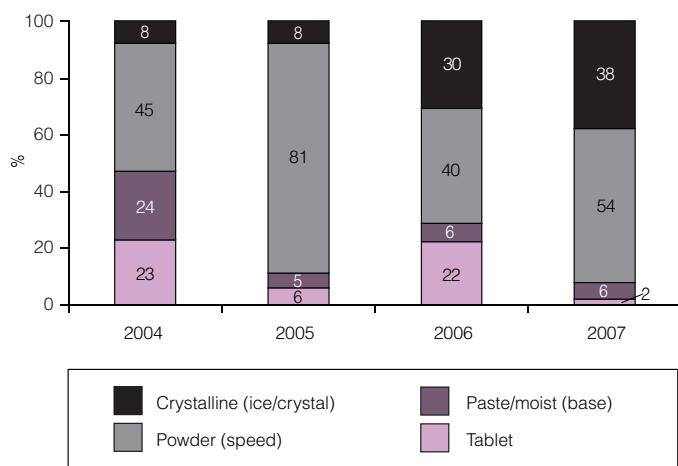


The illicit manufacture of methylamphetamine aims to achieve a dry powder product or form. The traditional form, commonly referred to by users as 'speed', can be easily diluted, packaged and distributed and is also amenable to several routes of administration, including via snorting, injecting or swallowing. The emergence of the tablet form was an easy extension of the powder presentation and occurred as the illicit market evolved in the context of a dance culture in which orally consumed tablets became the preferred form and route of administration. These tablets are not typically considered by users to be a form of methylamphetamine, and are therefore considered to be sold as ecstasy<sup>[11]</sup>.

The paste substance, known by street terms including 'base' and 'pure', is likely to be the result of poor quality illicit production. It has not been sufficiently refined to achieve the powder form, leaving the substance with a moist or often sticky texture. The appearance of paste may have resulted from the rapid growth in illicit production where an increased number of less experienced illicit 'cooks' were producing a poor product. Nonetheless, the moist nature of this product makes it difficult to dilute (or cut) often resulting in the paste having a higher purity level (not to be confused with higher quality) and may account for its popularity and use by some user groups. The crystalline or 'ice' form of methylamphetamine is the newest presentation within the illicit market. Its manufacture involves an additional step which aims to achieve a more highly refined (purity and quality) product. Despite these attempts, as with other illicit drugs, significant variation exists in the quality and purity of this drug form.

Figure 1 shows the proportion of methylamphetamine seizures accounted for by each of the various forms between 2004 and 2007. It is evident that the powder form of this drug has remained the dominant presentation, accounting for an overall average 55% of total methylamphetamine seizures over the four year period. The data also suggest an increase in the proportion of crystalline methylamphetamine, from 8% in 2004 and 2005 to 38% in 2007.

**Figure 1: Forms of methylamphetamine, Victoria, 2004-2007**

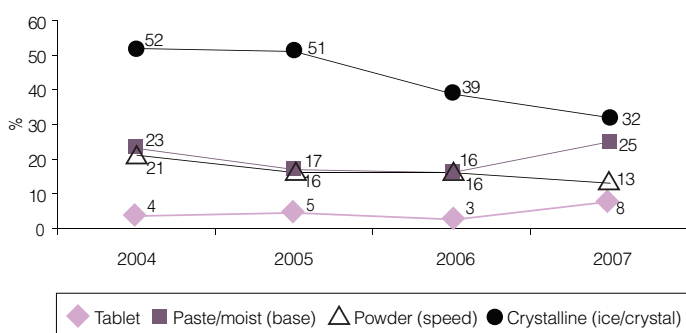


*Note: 2007 data complete to approximately August 2007*

## Purity

While it is not possible to infer the purity of methylamphetamine based on its appearance, some generalities and differences are reflected in the average purity data for the years 2004-2007 (Table 2). Again, it is important to emphasise that average purity is only a guide, demonstrating an overall general trend with respect to the drug level of these various forms. However, it is interesting to note that in 2007, the tablet form remained the lowest purity form and that, as the prevalence of ice/crystal increased (Figure 1), the average purity of this form has markedly decreased (Figure 2).

**Figure 2: Average purity by drug form, Victoria, 2004-2007**



*Note: 2007 data complete to approximately August 2007*

Tables 2 provides a more detailed breakdown of the frequency by weight purity distribution for the various forms in 2004 and 2007. The purity distribution of the tablet form was similar in both years, with over 95% of seizures found to have a purity of between 0-10%. Purity of the paste form was less variable in 2007 compared to 2004, with a larger proportion of seizures found to be 0-10% pure in 2007. Methylamphetamine powder was of relatively low purity in both years at 30% or less, with a smaller proportion of higher purity seizures in 2007. As previously shown in Figure 2, the most marked change can be seen in ice/crystal; 85% of seizures made in 2004 had a purity of 50% or greater, while in 2007 only 17% had a purity of 50% or greater (Table 2).

**Table 2: Purity distribution within samples, percentage by weight, Victoria, 2004 and 2007**

		0-10%	10-30%	30-50%	50-70%	>70%
% tablet	2004	96	4	-	-	-
	2007	98	2	-	-	-
% paste/moist (base)	2004	53	11	16	20	<0.5
	2007	83	13	4	-	-
% powder (speed)	2004	14	62	11	12	1
	2007	22	77	0.5	-	0.5
% crystalline (ice/crystal)	2004	4	7	4	60	25
	2007	15	61	7	15	2

*Note: 2007 data complete to approximately August 2007*

The nature and type of adulterants (cutting agents, or diluents) should also be considered. For the 2004-2007 period there was no obvious association between drug form and cutting agents. In general the types of substances identified included a variety of sugars (e.g. glucose, lactose, sucrose, mannitol), caffeine, dimethyl sulphone (MSM) and various other pharmaceuticals (e.g. paracetamol, ephedrine). A significant proportion of cutting agents were identified as 'unknown'; these occur when the chemical analysis indicates the presence of another substance but where it is not identified by the routine forensic examination.

## Conclusions and Implications

This bulletin updates previous work examining the main forms of methylamphetamine (also referred to as methamphetamine) in the Australian illicit drug market<sup>[8, 11]</sup>. The continued presence of the powder, paste and crystalline forms was noted in Victoria over the period 2004-2007. Seizures of a fourth, tablet, form, were also made over this period; however these tablets are largely sold as 'ecstasy' rather than as methylamphetamine per se<sup>[11]</sup> and have been discussed in further detail elsewhere<sup>[19]</sup>.



While crystalline methylamphetamine is typically thought to be of higher purity, the current results show that 61% of presentations with a crystalline appearance in Victoria during 2007 had a purity of between 10-30%, with a small proportion having either a lower or higher purity. Previous research conducted on seizures made in Victoria also indicated that the purity of ice/crystal was bimodal at an average of 19% and 80%<sup>[11]</sup>, with the majority of seizures falling into the former category. As such, the current data continue to suggest that appearance alone does not provide a reliable indication of purity.

The crystalline form, ice/crystal, followed by base, continued to have the highest average purity compared to other forms of methylamphetamine and the proportion of methylamphetamine seizures accounted for by the crystalline form increased between 2004 and 2007. However, ice/crystal purity decreased over this time to an average of 32% (52% in 2004). The average purity of speed powder also decreased over this period, while base has fluctuated. This may be a reflection of changes in domestic production vs. importation.

As in previous years, speed accounted for the largest proportion of seizures in Victoria. Interviews with regular drug users conducted during the 2007 EDRS and IDRS indicate that speed is also more commonly used than other forms of methylamphetamine in many jurisdictions<sup>[20, 21]</sup>. When considering data relating to methylamphetamine, then, caution should be taken to avoid inferring that 'methylamphetamine' or 'methamphetamine' is synonymous with 'ice' or 'crystal', as may be construed from the popular media in recent times. Clarification of these issues is recommended to ensure that public health and education messages are credible and effective.

In addition to varying appearance and purity of methylamphetamine, a wide variety of adulterants, or cutting agents, have also been detected. As with all illicit drugs, there are risks associated with the use of substances of unknown content and purity. Data from analysed seizures give a more objective picture of purity and content than user perceptions which are subjective in nature, affected by factors such as tolerance and environment. The unique situation in Victoria, where all seizures are analysed, is useful not only for the law enforcement responses it is designed to inform, but also can be used to inform demand reduction (including prevention and treatment) and harm reduction efforts. Wider implementation of this approach across all jurisdictions, including regular and timely release of this information, would be of benefit.

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