

Methamphetamine use, forms, and routes of administration among people who regularly consume drugs in Adelaide, South Australia

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Key findings:

- Since monitoring commenced, recent (i.e., past six month) use of methamphetamine has remained high and stable amongst the Illicit Drug Reporting System (IDRS) sample of people who regularly inject drugs (83% in 2018).
- In the Ecstasy and related Drugs Reporting System (EDRS) sample who regularly use ecstasy and other illicit stimulants, recent use of methamphetamine declined from 92% in 2003 to 32% in 2013. Recent years have seen an increase in use (33% in 2015 to 45% in 2018).
- Crystal methamphetamine was the form most used by methamphetamine consumers in both the IDRS (95%) and the EDRS (89%) in 2018, with lower levels of powder and base use.
- Whilst frequency of crystal methamphetamine use remained low among the EDRS sample (median 10 days in the previous six months) in 2018, median days of use among the IDRS sample has steadily increased since 2014 (median 72 days in the previous six months in 2018).
- The main route of administration for crystal methamphetamine among the IDRS participants was injecting (73% in 2018), with one-quarter (25%) of consumers both smoking and injecting crystal methamphetamine in 2018.
- On the other hand, EDRS participants mostly reported smoking crystal methamphetamine (64% of consumers smoking only), with less than 5% of participants reporting injecting crystal methamphetamine in each year over the course of monitoring.

Background

Use of methamphetamine has been of recent public health concern in Australia (1). In Australia, methamphetamine is usually marketed in three forms: powder, paste ('base') or crystal ('ice') form. Whilst the powder and paste forms are of moderate purity and are typically locally produced, crystal methamphetamine is substantially higher in purity and readily available, though usually imported into Australia (2). According to the 2016 National Drug Strategy Household Survey (NDSHS), use of methamphetamine in Australia significantly declined in 2016 relative to previous years, from 2.1% in 2013 to 1.4% of adults aged 14 years or older in 2016. Nevertheless, a significant increase transpired nationally in the proportion of people who reported that crystal methamphetamine was their main form of methamphetamine used, from 22% in 2010 to 57% in 2016. An increase in smoking as the main route of administration (16% in 2010 to 42% in 2016) and in the frequency of use of crystal methamphetamine as the main form (from 25.3% in 2013 to 31.9% in 2016 reporting use 'once a week or more') was also observed (3).

Some research has suggested that methamphetamine consumers may consider smoking to be a safer route of administration than injecting (4, 5). This perception is of particular concern due to a number of health risks associated with smoking (6), including poor health (7, 8), the ability to safely monitor the quantity consumed (9) and high levels of associated methamphetamine dependence and psychosis (5), especially among young recreational consumers (2). In light of this, this bulletin reports on use of methamphetamine, with a specific focus on crystal methamphetamine and route of administration, amongst two samples of people from Adelaide, South Australia who regularly consume drugs.

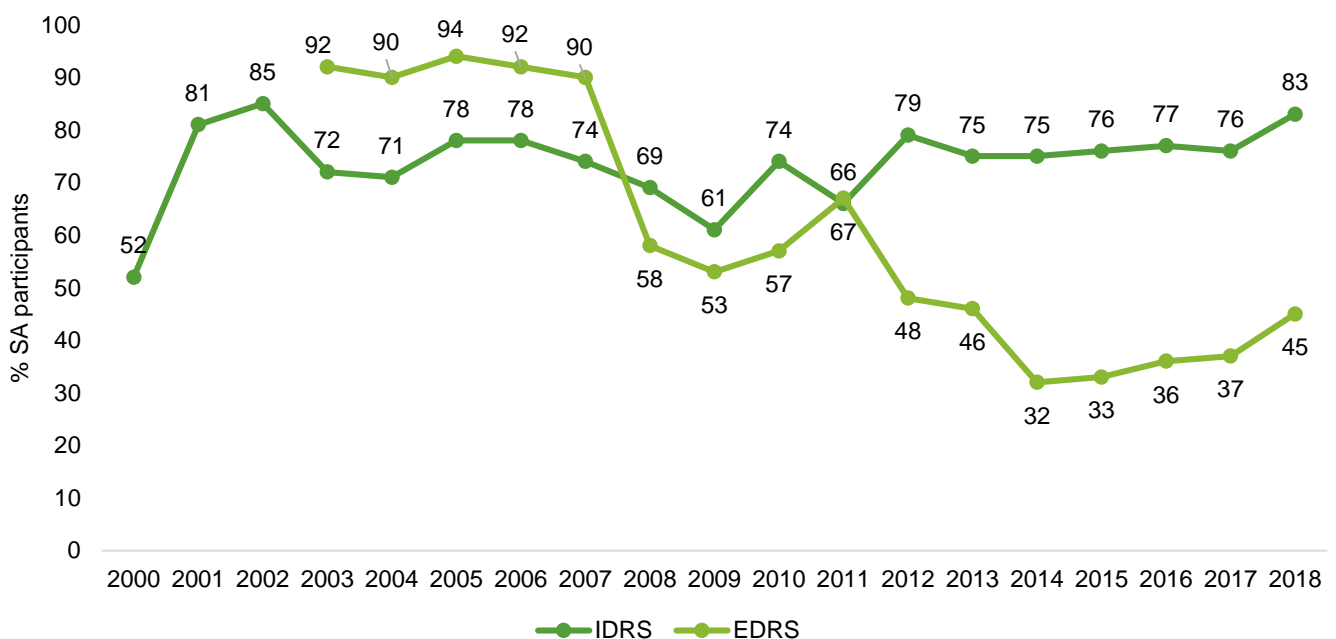
Data sources used

- Illicit Drug Reporting System (IDRS) interviews: Annual face-to-face interviews with approximately 100 people who regularly inject drugs, recruited mainly through clean needle programs and through word-of-mouth in Adelaide, South Australia; and
- Ecstasy and Related Drug Reporting System (EDRS) interviews: Annual face-to-face interviews with approximately 100 people who regularly use ecstasy and other stimulants, recruited mainly via social media advertising and through word-of-mouth in Adelaide, South Australia. Full details of the [methods for the annual interviews](#) are available for download.

Results from SA IDRS and EDRS interviews:

Reports of recent (i.e., past six month) use of any methamphetamine amongst the IDRS sample have mostly ranged between three-fifths and four-fifths of the sample each year (83% in 2018). In contrast, a decline in use has been evident amongst the EDRS sample: from 94% in 2005 to 32% in 2014, with an upwards trend since (45% in 2018; Figure 1).

Figure 1. Past six month use of any methamphetamine, SA IDRS and EDRS, 2000-2018

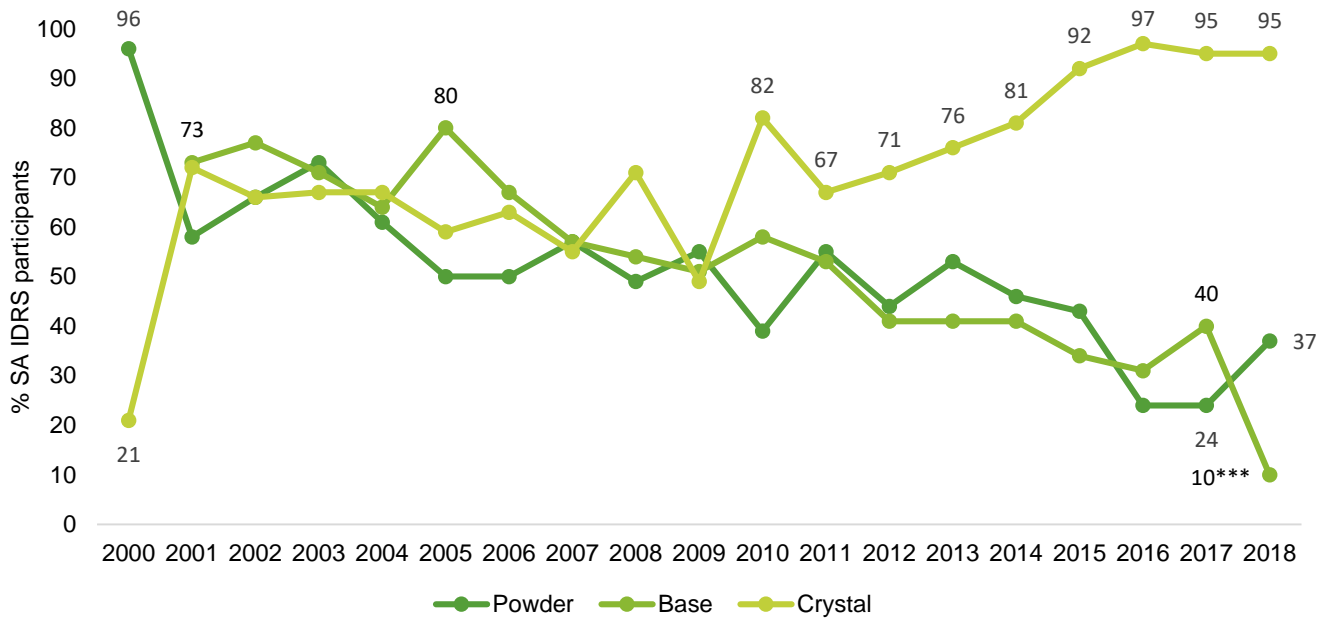


Note: National EDRS data collection commenced in 2003. * $p < 0.050$; ** $p < 0.010$; *** $p < 0.001$ for 017 versus 2018.

Use of crystal methamphetamine has steadily increased among methamphetamine consumers since 2012 in the IDRS sample, peaking at 97% of consumers in 2016 (95% in 2018; Figure 2). This has been matched by a decline in use of powder and base methamphetamine, with the latter evidencing a particular decrease in recent use among consumers from 2017 (40%) to 2018 (10%; $p < 0.001$).

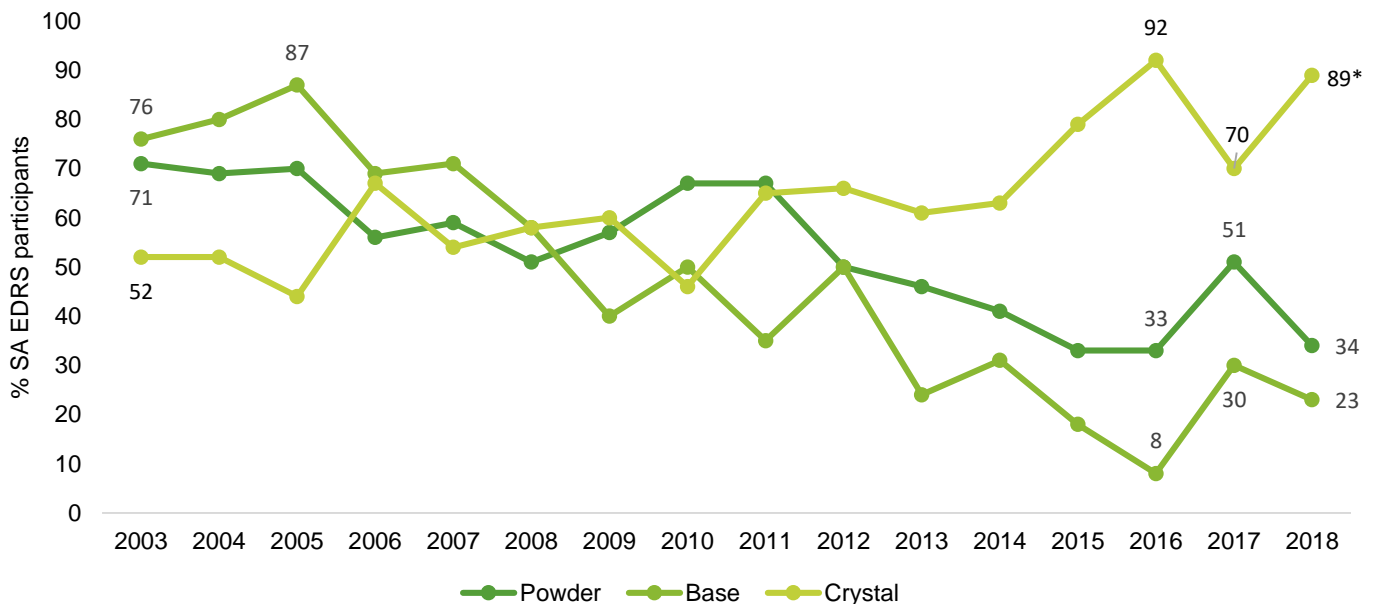
Likewise, recent use of crystal methamphetamine has shown an overall increasing trend, including a significant increase in the percentage reporting recent use in the 2018 EDRS sample relative to 2017 (89% versus 70%; $p < 0.050$). Use of both powder and base methamphetamine have declined over the years (Figure 3).

Figure 2. Past six month use of methamphetamine powder, base and crystal, of those who had used methamphetamine recently, SA IDRS, 2000-2018



Note. Methamphetamine base not included in 2000. * $p < 0.050$; ** $p < 0.010$; *** $p < 0.001$ for 017 versus 2018.

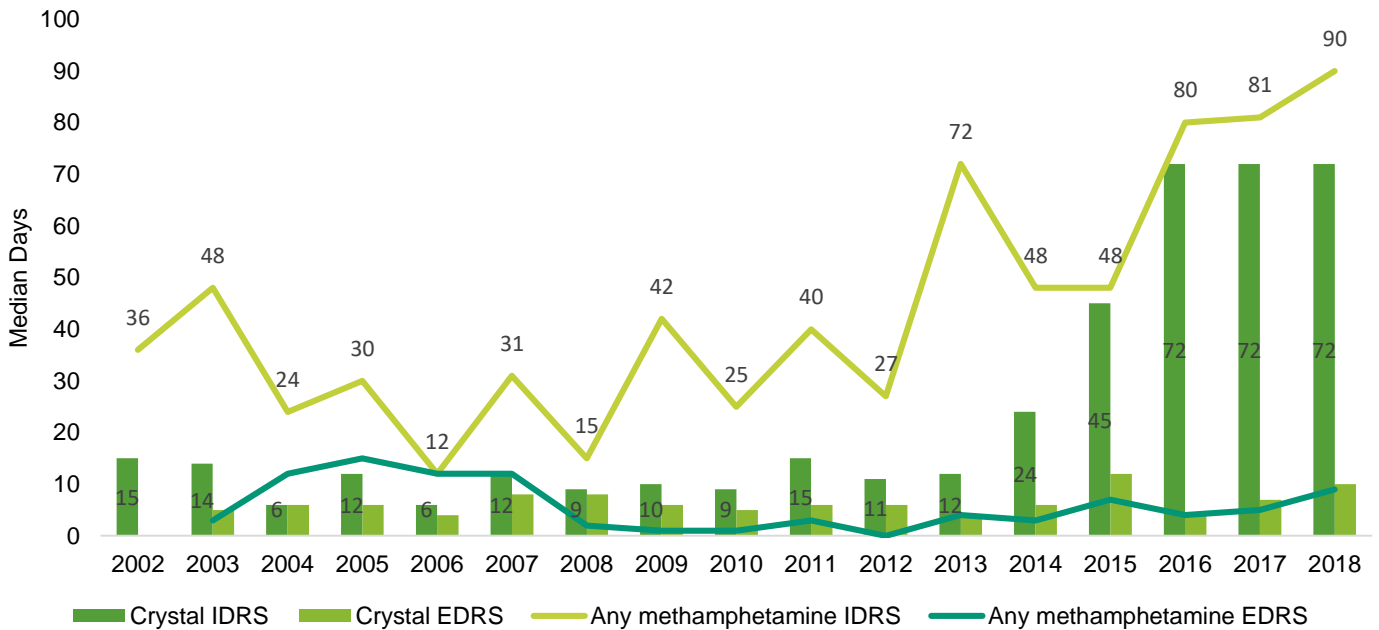
Figure 3. Past six month use of methamphetamine powder, base and crystal, of those who had used methamphetamine recently, SA EDRS, 2003-2018



Note. * $p < 0.050$; ** $p < 0.010$; *** $p < 0.001$ for 2017 versus 2018.

Frequency of use of crystal methamphetamine remained fairly low and stable among the EDRS sample, with consumers in 2018 reporting use on a median of 10 days in the past six months. This was in contrast to the IDRS sample, where consumers reported using crystal methamphetamine on a median of 72 days in the six months prior for the third year running (equating to thrice weekly use; Figure 4).

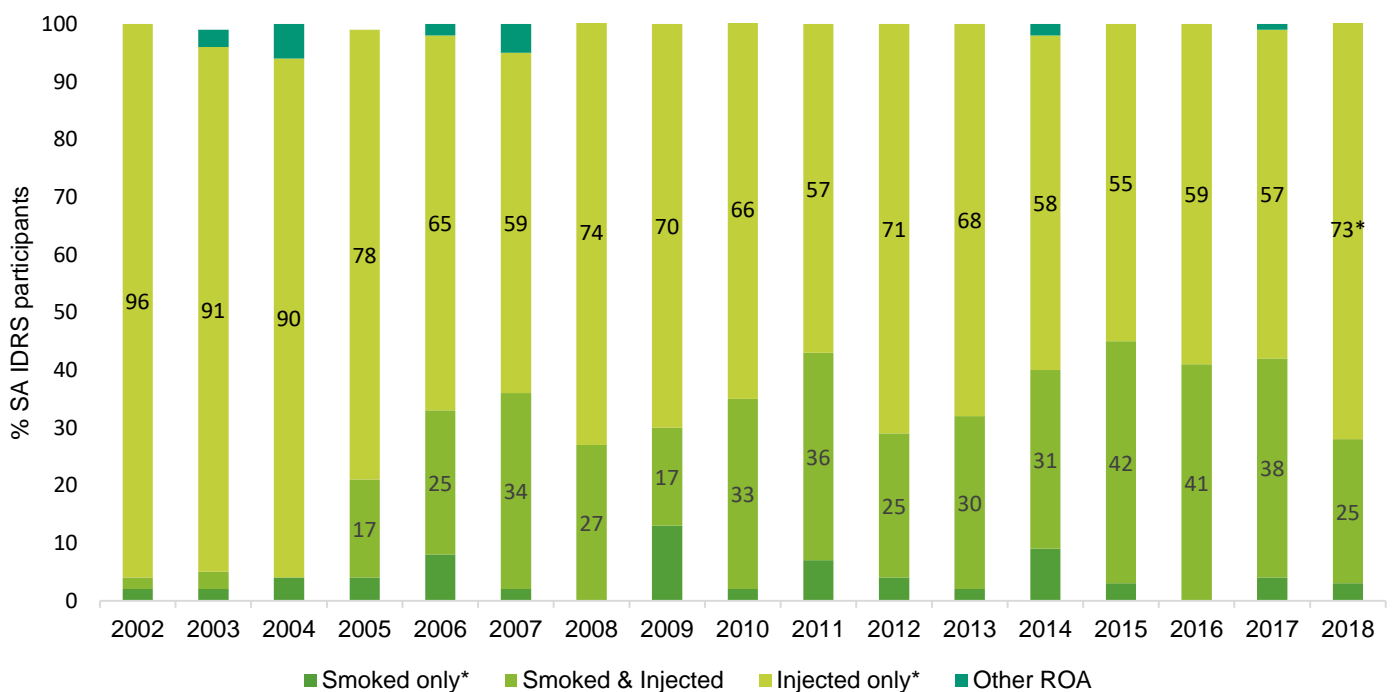
Figure 4. Frequency of use of crystal methamphetamine, SA IDRS and EDRS, 2002-2018



Note. * $p < 0.050$; ** $p < 0.010$; *** $p < 0.001$ for 2017 versus 2018.

Among IDRS participants, there has been a general trend of fewer consumers of crystal methamphetamine reporting only injecting crystal methamphetamine, and a growing percentage reporting both injecting and smoking crystal in the last six months (although the former is the more common scenario across all years; Figure 5). In saying this, findings in 2018 contradicted this statement, with an increase in the percentage of participants reporting injecting only in 2018 (73% versus 57% in 2017; $p < 0.05$). It is important to note here that the IDRS sample are recruited on the basis of regularly injecting drugs.

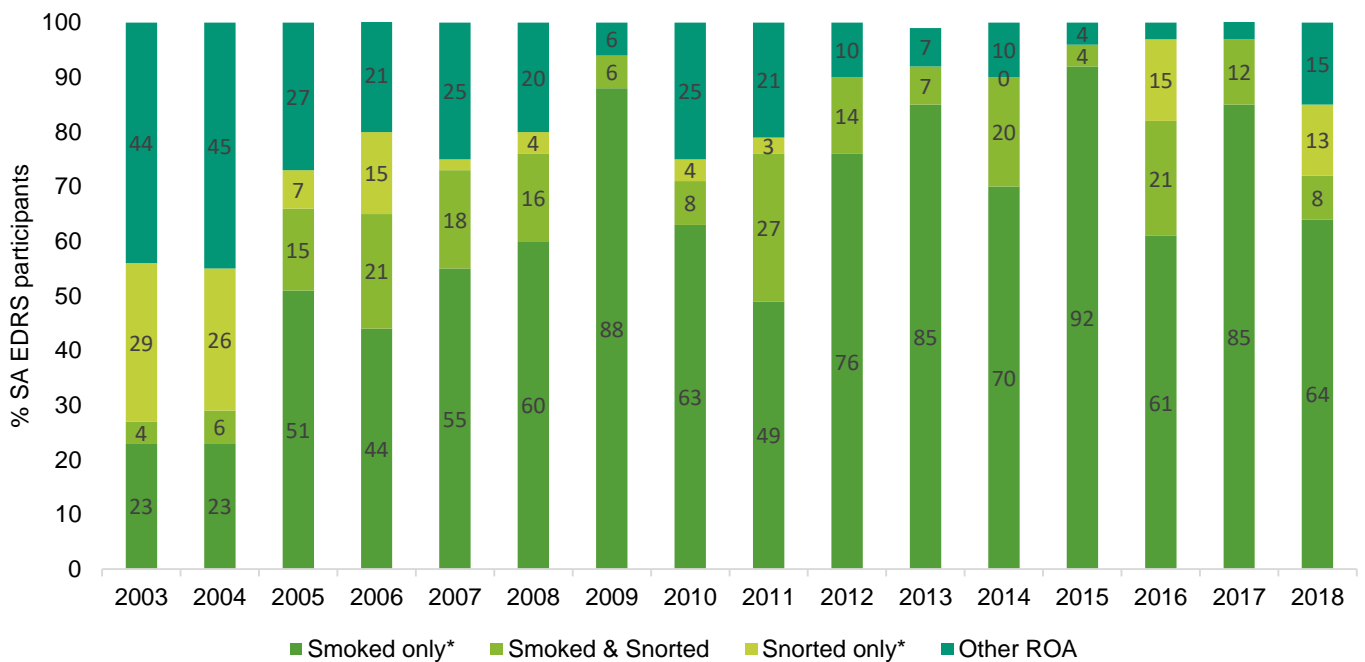
Figure 5. Participants who had recently used crystal methamphetamine who reported smoking, injecting or a combination of smoking and injecting, SA IDRS, 2002-2018



Note: *'Smoked' only and 'Injected' only may include other ROA e.g. swallowing. ROA was not asked for crystal methamphetamine 2000-2001. Other ROA includes swallowing and snorting. * $p < 0.050$; ** $p < 0.010$; *** $p < 0.001$ for 2017 versus 2018.

The percentage of consumers of crystal methamphetamine in EDRS reporting only using crystal by smoking in the last six months increased from 2003 to 2009 (23% to 88%). Since then, at least three-fifths of consumers have generally reported smoking only (64% in 2018; 72% smoking and snorting). Less than 5% of participants reported injecting crystal methamphetamine throughout the years of monitoring (Figure 6).

Figure 6. Participants who had recently used crystal methamphetamine who reported smoking, snorting or a combination of smoking and snorting, SA EDRS, 2003-2018



Note. **Smoked' only and 'Snorted' only may include other ROA e.g. swallowing. Other ROA includes swallowing, shelving and/or injecting. Less than 5% of participants reported injecting crystal methamphetamine throughout the years of monitoring. * $p < 0.050$; ** $p < 0.010$; *** $p < 0.001$ for 2017 versus 2018.

Discussion

Methamphetamine use has remained common amongst the sample of people who inject drugs (IDRS) and declined in the sample who regularly use ecstasy and other illicit stimulants (EDRS), although the latter group has evidenced a small increase in use in recent years. Despite an overall increase in recent crystal methamphetamine use and frequency of use within the SA IDRS sample, reports of smoking crystal methamphetamine remained low and stable among consumers. In contrast, smoking as a route of administration for crystal has increased in popularity over time (and is now the primary route of administration) amongst the EDRS sample. Indeed, crystal is now used by approximately nine in ten consumers of the methamphetamine in the EDRS sample.

It is important to note that these findings from this sentinel sample mostly align with other data sources with respect to peaks in methamphetamine use in early-mid 2000s and again since 2014, and increased use of the crystal form:

- The [National Drug Strategy Household Survey](#) results showed an increase of crystal methamphetamine as the main form of methamphetamine used amongst consumers in South Australia, from 38% in 2010 to 79% in 2016 (3).
- The [National Wastewater Drug Monitoring Program](#) has monitored population-level exposure to any methamphetamine since 2016, recording increased estimated average consumption in Adelaide in late 2017/early 2018 (10).
- The [Australian Needle and Syringe Program Survey](#) showed that the percentage of people attending needle and syringe programs and reporting methamphetamine as drug last injected peaked in the early-mid 2000s (40%-52% in 2001-2008), rising again from 2014 (between 49%-60% in 2014-2017; 49% in 2017) (11).
- Number of positive amphetamine urine detections among Adelaide adult male detainees as part of the [Drug Use Monitoring in Australia](#) program declined from 38% in 2005 to 12% in 2010, increasing again to 41% in 2015-16 (reportedly driven by methamphetamine; no information on form, frequency of use or route of administration reported) (12).

The distinct sociodemographic and substance use profiles of the samples likely explain differences in methamphetamine consumption patterns: the IDRS sample is typically mostly male (68% in 2018) and middle-aged (median 47 years in 2018), with very frequent drug involvement. The EDRS sample is also mostly male (70%), but much younger (median 21 years), with lower rates of disadvantage (e.g., lower rates of unemployment, poor educational attainment, incarceration; see [IDRS](#) and [EDRS](#) reports for further information). Whilst we have not presented here the specific characteristics of methamphetamine consumers in each sample, this broad characterisation of the total sample aligns with findings from McKetin et al. (13) who found that people who smoke methamphetamine were significantly younger, were more likely to report current ecstasy use, less likely to have a prison history and typically had higher levels of schooling compared to those who injected methamphetamine.

It is important to note that previous research has shown that people who smoke methamphetamine report harms arising from smoking (13). These observations coupled with the results from the present study emphasise the need to develop appropriately tailored interventions to reduce the harms associated with smoking methamphetamine and to implement strategies on how best to communicate harm-reduction messages.

References

1. Degenhardt L, Roxburgh A, Black E, Bruno R, Campbell G, Kinner S, Fetherston, J. The epidemiology of methamphetamine use and harm in Australia. *Drug and Alcohol Review*. 2008;27(3):243-52.
2. McKetin R, McLaren J, Kelly E. The Sydney methamphetamine market: patterns of supply, use, personal harms and social consequences. In: National Drug Law Enforcement Research Fund, Adelaide, Australasian Centre for Policing Studies 2005.
3. Australian Institute of Health and Welfare. National Drug Strategy Household Survey 2016: Detailed findings. Canberra, AIHW 2017.
4. Helsechober B, Miller MA. Methamphetamine abuse in California. *NIDA research monograph*. 1991;115:60-71.
5. Matsumoto T, Kamijo A, Miyakawa T, Endo K, Yabana T, Kishimoto H, et al. Methamphetamine in Japan: the consequences of methamphetamine abuse as a function of route of administration. *Addiction (Abingdon, England)*. 2002;97(7):809-17.
6. Kinner SA, Degenhardt L. Crystal methamphetamine smoking among regular ecstasy users in Australia: increases in use and associations with harm. *Drug and Alcohol Review*. 2008;27(3):292-300.
7. Shaner JW, Kimmes N, Saini T, Edwards P. "Meth mouth": rampant caries in methamphetamine abusers. *AIDS Patient Care and STDs*. 2006;20(3):146-50.
8. Klasser GD, Epstein J. Methamphetamine and its impact on dental care. *Canadian Dental Association*. 2005;71(10):759-62.
9. Harris DS, Boxenbaum H, Everhart ET, Sequeira G, Mendelson JE, Jones RT. The bioavailability of intranasal and smoked methamphetamine. *Clinical Pharmacology and Therapeutics*. 2003;74(5):475-86.
10. Australian Criminal Intelligence Commission. National Wastewater Drug Monitoring Program. 2018;Report 6, December 2018.
11. Heard S, Iversen J, Geddes L, Maher L. Australian Needle Syringe Program Survey National Data Report 2013-2017: Prevalence of HIV, HCV and injecting and sexual behaviour among NSP attendees. In: Kirby Institute. Sydney 2018.
12. Patterson E, Sullivan T, Ticehurst A, Bricknell S. Drug use monitoring in Australia: 2015 and 2016 report on drug use among police detainees. In: Australian Institute of Criminology. Canberra 2018.
13. McKetin R, Ross J, Kelly E, Baker A, Lee N, Lubman D, Mattick, R. Characteristics and harms associated with injecting versus smoking methamphetamine among methamphetamine entrants. *Drug and Alcohol Review*. 2008;27(3):277-85.

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