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Abstract | This paper investigates the extent of polydrug use and recent polydrug trends among police detainees. Forty-one percent of detainees reported having used more than one illicit drug in the 30 days before detention. Fifty-nine percent of these used two drugs.

The most common combination of polydrug use was cannabis and methamphetamine, and the proportion of detainees reporting this combination has more than doubled since 2009.

Urinalysis data suggested that detainees under-reported polydrug use. The results indicate that more detainees may be at risk of the harms associated with polydrug use than survey data suggest.

Polydrug use among police detainees

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Polydrug use is the consumption of two or more drug types within a defined period of time. It may be limited to illicit drugs, or may include illicit drugs and legal drugs such as alcohol and tobacco. The Australian Institute of Health and Welfare (AIHW) found that in 2016 three percent of the general Australian population aged 14 years and over reported risky drinking, daily smoking and illicit drug use in the previous 12 months (AIHW 2017). Six percent of the population reported both risky drinking and recent illicit drug use (AIHW 2017). The proportion using two or more illicit drugs is currently unclear. This study aims to contribute to this under-reported area.

Polydrug use is common among young adults and widespread among specific populations, such as people who regularly inject drugs, users of ecstasy or other illicit psychoactive substances, and police detainees (Quek et al. 2013; Stafford & Breen 2017a, 2017b; Sweeney & Payne 2011). The high rate of polydrug use among police detainees is relevant to law enforcement agencies, in part because detainee surveys have found polydrug use to be linked to a higher rate of acquisitive crime and the receipt of income from drug dealing and other illegal sources (Bennett & Holloway 2005; Sweeney & Payne 2011).

The Drug Use Monitoring in Australia (DUMA) program is the nation's longest running survey of police detainees, collecting demographic information as well as information about their offending and drug use history. Recent DUMA data have shown changing patterns in drug use, such as a steady increase in methamphetamine use and a decline in heroin use. Understanding how these changes are reflected in patterns of polydrug use would assist with training, program design and policy development for health professionals and law enforcement. This study seeks to update Sweeney and Payne's 2011 examination of polydrug use among Australian police detainees, explore recent trends in illegal polydrug use among detainees and identify which combinations of drugs are used most frequently by this group.

Methodology

This study drew on data collected in 2016 as part of the DUMA program, run by the Australian Institute of Criminology (AIC). DUMA collects information on the drug use and offending habits of police detainees across Australia. Participation is voluntary, anonymous and confidential. In 2016, data were collected from 2,199 adult detainees in Adelaide, Brisbane, Perth and Sydney (Bankstown and Surry Hills) police stations and watch houses. Overall, 1,180 police detainees provided a urine sample and 918 (78%) tested positive to at least one drug. This study compared urinalysis results with reported use in the last 48 hours for all drugs, although it is acknowledged that the presence of different drugs can be detected via urinalysis for different time periods (Makkai 2000).

Results

The extent of polydrug use among detainees

The extent of polydrug use reported by police detainees was measured across three time periods: the last 12 months, last 30 days and last 48 hours. Polydrug use was defined as the use of two or more illegal drugs. The drugs could be illicit substances—cannabis, heroin, methamphetamine, ecstasy, cocaine and hallucinogens—or inhalants or prescription drugs such as benzodiazepines, opiates, antipsychotic medications and anabolic steroids obtained without a prescription. To make the data comparable with Sweeney and Payne's (2011) analysis, only detainees who had used prescription drugs non-medically were included. Alcohol was excluded from this analysis.

Sixty percent (n=1,328) of all detainees reported using two or more illegal drugs in the last year (see Table 1). Forty-one percent (n=896) reported using two or more illegal drugs in the 30 days before detention and 15 percent (n=329) reported using two or more illegal drugs in the previous 48 hours. The proportion of detainees who reported using two or more illegal drugs in the 30 days before detention increased from 30 percent in 2009 (Sweeney & Payne 2011) to 41 percent in 2016.

Of those reporting polydrug use in the 30 days before detention, 59 percent (n=532) had used two drugs, 21 percent (n=192) had used three drugs, 12 percent (n=108) had used four drugs and seven percent (n=64) had used five or more drugs (Table 1).

Table 1: Prevalence of reported polydrug use, 2016						
	Last 12 months		Last 30 days		Last 48 hours	
	n	%	n	%	n	%
Two drugs	510	38	532	59	251	76
Three drugs	325	24	192	21	57	17
Four drugs	209	16	108	12	19	6
Five or more drugs	284	21	64	7	2	1
Two or more drugs	1,328		896		329	

Note: Percentages may not total 100 due to rounding. Base is the number of detainees using two or more drugs in relevant time period
Source: AIC DUMA collection 2016 [computer file]

These results can also be expressed as proportions of the drug-using detainee population, which Sweeney and Payne (2011) note is perhaps a more relevant measure for criminal justice programs targeted at drug offenders. Among the detainees who reported using drugs:

- 74 percent (n=1,328) had used two or more different drugs in the past 12 months (up from 64% in 2009);
- 58 percent (n=896) had used two or more different drugs in the past 30 days (vs 49% in 2009); and
- 34 percent (n=329) had used multiple drugs in the past 48 hours (vs 29% in 2009).

Reported versus detected polydrug use

As these reported drug use data have shown, polydrug use is common among police detainees. However, people in a custodial setting can under-report recent drug use, despite assurances of confidentiality (Harrison 1997; Wish, Hoffman & Nemes 1997). As such, urinalysis data may more accurately measure the extent of recent polydrug use among the detainee population.

Of the 1,180 detainees who provided a urine sample in this study, 501 (42%) tested positive for two or more drugs. However, only 41 percent of this group (n=205) reported using two or more drugs in the last 48 hours. The remaining 296 detainees reported they had used one drug or no drugs in the last 48 hours, suggesting an under-reporting of recent drug use.

Table 2 shows the concordance in reported use and test positives for polydrug use. The number of detainees who tested positive to the same number of drugs they reported using is shown in the unshaded cells, the number of detainees who tested positive to more drugs than they reported using is in cells shaded green, and the number of detainees who used fewer drugs than they reported is in cells shaded grey.

Overall, 556 detainees (47%) reported using fewer drug types than were detected in their urine. Of the 580 detainees who did not report any drug use in the previous 48 hours, 34 percent (n=199) tested positive to one drug and 22 percent (n=125) tested positive for two or more drugs.

Table 2: Comparison of urinalysis results and reported drug use by adult detainees, 2016 (n)					
Urinalysis test positives[b]	Reported use (last 48 hours)[a]				
	Did not use	1 drug	2 drugs	3 or more drugs	Total
No test positives	256	11	1	1	269
1 drug	199	196	15	0	410
2 drugs	93	117	94	9	313
3 or more drugs	32	54	61	41	188
Total	580	378	171	51	1,180

a: Calculated from detainees who reported using cannabis, cocaine, benzodiazepines, heroin, prescription opiates, methamphetamine or ecstasy

b: Urinalysis screening was conducted for five classes of drugs—amphetamines, benzodiazepines, cannabis, cocaine and opiates. A secondary screening test was conducted for methadone and buprenorphine

Note: Includes sites in Adelaide, Bankstown, Surry Hills, Brisbane and Perth

Source: AIC DUMA collection 2016 [computer file]

The data show that most detainees who tested positive for cannabis (63%, n=334), heroin (56%, n=42) or methamphetamine (53%, n=321) reported having used these drugs in the last 48 hours. The urinalysis results of detainees who reported using only cannabis, only heroin or only methamphetamine in the 48 hours before detention were examined to ascertain the extent of misreported use among those reporting recent use of different drugs. Of the 177 detainees who reported using only cannabis in the 48 hours before detention and gave a urine sample, 57 percent (n=101) tested positive to cannabis and at least one other drug. On the other hand, of the 146 detainees who gave a urine sample and reported using only methamphetamine in the 48 hours before detention, about one in three (31%, n=45) tested positive to at least one other drug. Finally, all detainees who gave a urine sample and reported using only heroin tested positive to heroin and at least one other drug (n=5). These findings suggest detainees who report using only cannabis or heroin have a greater tendency to under-report their drug use than those who report using only methamphetamine. This suggests that, although users of heroin and cannabis are reporting their recent use, they may be more reluctant to identify that they are also using other drugs.

The study also compared trend data for urinalysis results and reported polydrug use. Figure 1 shows the proportion of detainees who reported polydrug use, compared with the proportion of detainees who provided a urine sample who tested positive to more than one drug. After a decline between 2007 and 2010, the proportion of detainees reporting polydrug use in the previous 48 hours has been stable. The proportion of detainees testing positive to more than one drug showed a slight upwards trend.

Figure 1: Trends in urinalysis results and reported polydrug use, 2007 to 2016 (%)

a: Self-report calculated from detainees who reported using two or more of the following drugs in the 48 hours before detention: cannabis, cocaine, benzodiazepines, heroin, prescription opiates, methamphetamine, and ecstasy. Percentages expressed as a proportion of all detainees

b: Urinalysis calculated from detainees who tested positive to two or more of: cannabis, cocaine, benzodiazepines, heroin, opiates other than heroin (eg methadone, buprenorphine), methamphetamine and ecstasy. Percentages expressed as a proportion of detainees who voluntarily provided a urine sample

Note: Includes four DUMA sites—Adelaide, Bankstown, Brisbane and Perth

Source: AIC DUMA collection 2007–16 [computer file]

Primary and secondary drug use

Findings from the DUMA program have recently identified changes in single drug use among police detainees. From 2010 to 2016, the proportion of detainees using heroin decreased from 10 percent to three percent, while those using amphetamines, including methamphetamine, increased from 19 percent to 53 percent (Patterson et al. 2018). Polydrug use data can enhance knowledge of drug use trends by identifying the primary drug—that is, the drug that users of two or more drugs consume most often. This study analysed primary and secondary drug use data for heroin, methamphetamine, cannabis and ecstasy because the DUMA program collected information on frequency of use for only these drugs.

Between 2010 and 2016, the consumption of heroin as a primary drug decreased (21% in 2010 vs 6% in 2016) while primary use of methamphetamine increased (21% in 2010 vs 38% in 2016; see Figure 2). Primary use of cannabis, which was the primary drug of choice among polydrug users, and ecstasy remained relatively stable during this period.

Figure 2: Primary drug used by polydrug users in the last 30 days, 2007 to 2016 (%)
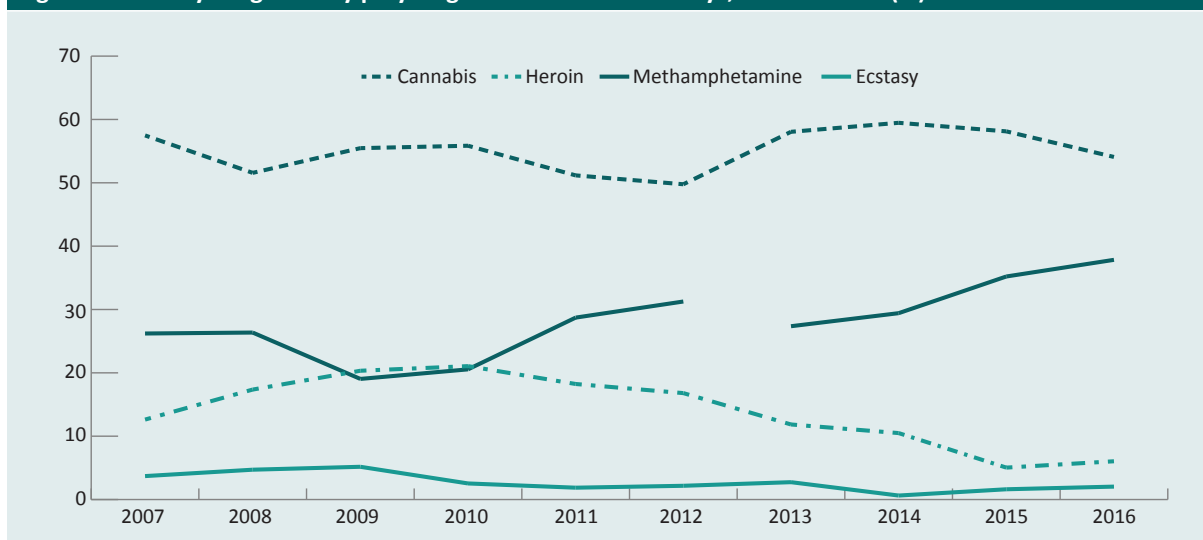
Note: Includes four DUMA sites—Adelaide, Bankstown, Brisbane and Perth. Data were collected from those who reported use in the 30 days before detention. In 2013, the self-report question changed from asking detainees whether they had used 'amphetamine/speed/methamphetamine' to whether they had used 'methamphetamine/speed/ice'. This change is represented as a break in the time series. Data were not collected in Q1 and Q2 of 2013

Source: AIC DUMA collection 2007–16 [computer file]

Primary and secondary drug use combinations

Of the 1,505 detainees who reported using cannabis, methamphetamine, heroin or ecstasy in the 30 days before detention, 756 detainees (50%) reported using two or more of these drugs. Table 3 provides a breakdown of polydrug use combinations by the detainees' primary and secondary drugs.

Cannabis was the most commonly used primary drug (54%, n=409), followed by methamphetamine (37%, n=278). The most frequent combination of drugs was cannabis and methamphetamine (78%, n=587), with cannabis being the primary drug for most detainees reporting this combination of drug use (n=361). Cannabis and methamphetamine was also the most commonly used combination among Australian police detainees in 2009 (Sweeney & Payne 2011), but the proportion of detainees who reported using these drugs together has increased substantially (30% in 2009 vs 78% in 2016). Given the proportion of detainees using cannabis has been relatively stable over this period (48% in 2009 vs 44% in 2016), the rise in methamphetamine use has driven this increase.

Much lower proportions of detainees reported use of other drug combinations. For example, nine percent (n=69) had used heroin and methamphetamine in the last 30 days, most of whom used heroin as their primary drug (n=46).

Table 3: Reported primary and secondary drug combinations, 2016			
	n	% primary drug	% overall[a]
Cannabis as a primary drug			
Cannabis/heroin	26	6	3
Cannabis/methamphetamine	361	88	48
Cannabis/ecstasy	22	5	3
Total reporting cannabis & heroin, methamphetamine or ecstasy	409		54
Total reporting cannabis only	351		
Heroin as a primary drug			
Heroin/cannabis	17	26	2
Heroin/methamphetamine	46	71	6
Heroin/ecstasy	2	3	<1
Total reporting heroin & cannabis, methamphetamine or ecstasy	65		9
Total reporting heroin only	21		
Methamphetamine as a primary drug			
Methamphetamine/cannabis	226	81	30
Methamphetamine/heroin	23	8	3
Methamphetamine/ecstasy	29	10	4
Total reporting methamphetamine & cannabis, methamphetamine or ecstasy	278		37
Total reporting methamphetamine only	350		
Ecstasy as a primary drug			
Ecstasy/cannabis	3	75	0
Ecstasy/heroin	0	0	0
Ecstasy/methamphetamine	1	25	<1
Total reporting ecstasy & cannabis, heroin or methamphetamine	4		1
Total reporting ecstasy only	23		

a: Proportions were calculated out of 756 detainees
Note: Percentages may not total 100 due to rounding
Source: AIC DUMA collection 2016 [computer file]

Frequency of primary and secondary drug use

Of the 756 detainees who reported using two or more of cannabis, methamphetamine, heroin or ecstasy in the 30 days before detention, 58 percent (n=437) reported using their primary drug almost every day (6–7 days per week), a slightly greater proportion than in 2009 (52%, n=597; Sweeney & Payne 2011; see Table 4). This was followed by detainees using their primary drug four to five times a week (18%, n=135), one to three times a week (15%, n=114) or less than once a week (9%, n=70).

Thirty percent (n=229) of recent polydrug users consumed both primary and secondary drugs four to seven times per week, a slightly higher proportion than in 2009 (24%, n=268; Sweeney & Payne 2011). Forty-five percent of polydrug users (n=343) reported using their primary drug at moderate to high levels (4–7 times per week) and their secondary drug less frequently (less than 3 times per week). One in four recent polydrug users (24%, n=184) reported using both primary and secondary drugs at low levels, a smaller proportion than in 2009 (33%, n=375; Sweeney & Payne 2011). These data suggest recent polydrug users appear to be using drugs more frequently.

Table 4: Frequency of primary and secondary drug use, 2016 (n)						
		Secondary				
		Less than once a week	1–3 times a week	4–5 times a week	6–7 times a week	Total
Primary	**Less than once a week**	70	–	–	–	70
	1–3 times a week	69	45	–	–	114
	4–5 times a week	51	67	17	–	135
	6–7 times a week	121	104	96	116	437
	Total	311	216	113	116	756

Source: AIC DUMA collection 2016 [computer file]

Discussion

This study contributes to research on polydrug use in several important ways. First, urinalysis data indicated that detainees under-reported polydrug use, suggesting that more detainees may be at risk of the harms associated with polydrug use than survey data suggest. Under-reporting may be related to social desirability, perceived consequences of reporting drug use, a lack of knowledge about the purity and composition of purchased illicit drugs, and recall issues that may be linked to drug use (Darke 1998; Miller, Donnelly & Martz 1997). These factors may help to explain the discrepancy between polydrug use reported by detainees and polydrug use detected by urinalysis.

Detainees were more likely to misreport recent drug use if they reported single drug use than if they reported using two drugs. Detainees may report using only one drug type for various reasons. For example, they may want to hide the extent of their drug use (Miller, Donnelly & Martz 1997). Individuals may also avoid reporting use of particular drugs due to the stigma attached to them, as in the case of heroin, which is among the drugs that Australians aged 14 years or over are least likely to personally approve the regular use of (AIHW 2017). The willingness of detainees to report use of particular drugs may also depend on how they obtained them (Preston et al. 1997). Additionally, individuals may report only the drug they have used most frequently or that they most prefer to use.

The study also showed that the proportion of DUMA police detainees reporting the use of two or more drugs has increased and the pattern of polydrug use has changed since 2009. Cannabis continued to be the primary drug for most detainees, but methamphetamine surpassed heroin as the second-most favoured primary drug. The most popular combination of primary and secondary drugs was cannabis and methamphetamine, with the proportion of detainees reporting use of this drug combination more than doubling in recent years. Furthermore, the frequency of use of primary and secondary drugs has increased.

It is important for frontline officers such as medical practitioners and law enforcement to understand the interactions between drugs and the effects that polydrug use can have on behaviour. Studies have found that interactions between drugs may lead to aggression and paranoia, resulting in increased hostility towards frontline officers (Dawe et al. 2009; Fuller & Goldsmid 2016; McKetin et al. 2014).

These drug interactions are also hazardous for users. For example, Darke, Kaye and Duflou (2017) found that in 83 percent of methamphetamine-related deaths in Australia between 2009 and 2015, an additional substance was also detected. There is also substantial evidence that the concurrent use of heroin and other drugs is associated with overdose and a greater severity of overdose (Coffin et al. 2007; Darke et al. 2014; Kerr et al. 2007; Roxburgh et al. 2017).

A limitation of this study is that it compared reported use of drugs in the last 48 hours with urinalysis results for all drugs, even though average detection time varies between drugs and depends on frequency of use. However, most drugs can be detected in urine samples within 48 hours. The study suggests polydrug use is a growing problem among offenders and that it may be partially hidden in self-reported drug use data. This underlines the importance of monitoring the impact of drug use trends on polydrug use and of understanding the interactions of different combinations of drugs.

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