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Cannabis use and mental health: Findings from a sample of offenders in police custody

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Key Points

- Cannabis is typically the illegal drug most commonly used among police detainees, and offenders in the criminal justice system are generally found to have a high rate of comorbidity
- Recent research has linked cannabis use with the development of psychosis as well as the earlier onset of psychotic illness
- Efforts to divert offenders with cannabis use and other drug use problems into treatment programs have increased in recent times. When working with drug dependent offenders research suggests that a multi-faceted approach is required to ensure both mental health and cannabis use problems are addressed
- Drug Use Monitoring in Australia (DUMA) data indicate that cannabis use is a statistically significant and independent predictor of the likelihood that a police detainee will be assessed as having a probable mental health-related disorder requiring further psychological assessment
- Diverting offenders into drug treatment with little or no regard to the presence of other mental health-related issues may limit program effectiveness.
- The current findings suggest that for frequent cannabis users, the effectiveness of drug diversion programs could be enhanced by the inclusion of mental health assessment and treatment conducted in conjunction with drug abstinence and other drug treatment programs

Introduction

The link between cannabis use and mental illness has received considerable attention in the academic literature in recent years, much of which points to a high degree of co-morbidity. For those in the law enforcement and criminal justice sectors, this relationship and its consequences for criminal activity is significant, due in part to the high prevalence of both cannabis use and mental illness (Farrell et al. 2002) within the offender population. Yet, disentangling the relationship between them can be complex insofar as cannabis is often just one of a number of drugs being used by offenders and mental illness is just one of a number of other personal, environmental and situational factors that are likely to influence offending.

In this context, Australia has seen a significant growth and investment in diversion and related intervention programs such as drug courts, intermediate diversion courts and police diversion schemes whose primary aim is to divert drug using offenders into treatment and rehabilitation services as an alternative to formal criminal justice processing (Wundersitz 2007). At the more intensive end, drug courts aim to divert heavily dependent offenders into community-based detoxification and drug abstinence programs as an alternative to incarceration. In contrast, police drug diversion schemes operate at the gateway of the criminal justice system for first time offenders. Cautions and referrals are used to divert drug users (primarily those who use cannabis) away from formal criminal justice sanctions and into brief intervention programs that target drug use. Exploring the links between mental health and cannabis use will provide health and criminal justice practitioners with valuable information about the complex needs of their clients and serve as a timely reminder about the need for a multi-faceted approach when working with drug dependent offenders within a detainee population.

In this paper, data collected through the Australian Institute of Criminology's (AIC) Drug Use Monitoring in Australia (DUMA) program are examined. The focus of analysis is on data collected in 2010, when for two data collection periods an addendum of pilot questions taken from the Corrections Mental Health Screening (CMHS) tool was incorporated into interviews with detainees. DUMA is Australia's largest and longest running survey of police detainees (offenders who are in police custody) across Australia, involving almost 4000 interviews each year (Sweeney & Payne forthcoming). The CMHS is an instrument comprising 12 questions for males and eight questions for females that is designed to identify individuals likely to be experiencing a probable mental health-related disorder as defined by the DSM-IV (Ford et al. 2007). The CHMS in not an alternative to thorough psychological assessment by a trained mental health practitioner, but instead, it is a short set of questions aimed at identifying individuals with a 'probable' mental health disorder who are in need of a more comprehensive psychological assessment. The CMHS has been recommended by the National Institute of Justice as an appropriate mental health screening tool for correctional settings in the United States (Ford et al. 2007).

Prior research linking cannabis use and mental health

A sizable amount of research including systematic reviews of multiple studies supports the hypothesis that cannabis is a contributing factor for the development of psychosis (Arseneault et al. 2004, Semple et al. 2005, Moore et al. 2007, Large et al. 2011) even after adjusting for pre-existing symptoms of psychosis and other social and contextual factors (Fergusson et al. 2003). Findings from a meta-analysis of more than 20,000 patients linked cannabis use with the earlier onset of psychotic illness, suggesting it can precipitate or hasten the onset of psychotic disorders such as schizophrenia (Large et al. 2011). However, not all such research has been conclusive, with some systematic reviews having mixed results (Minozzi et al. 2009, Zammit et al. 2008).

While there remains some debate over whether low frequency cannabis use can precipitate mental illness, there is stronger evidence to suggest that high frequency or heavy cannabis use is associated with a range of psychological disorders. For example, Arendt & Munk-Jorgensen (2004) found that heavy cannabis users entering treatment had previously been diagnosed with depression, personality disorders and schizophrenia at psychiatric hospitals significantly more frequently than heavy users of other drugs, while others have found that heavy cannabis use (Fergusson et al. 2003) or severe cannabis dependence (Farrel et al. 2002) increases the risk of psychosis.

In Australia there are few population-based surveys that collect information on the prevalence of both cannabis use and mental illness. Data such as those from the National Drug Strategy Household Survey (NDSHS), managed by the Australian Institute of Health and Welfare (AIHW), although often lacking the capacity to include comprehensive psychological measures of mental illness, can nevertheless provide a useful insight into the association between substance use and potential psychological disorders at the national population level.

According to the 2010 NDSHS, approximately 16 per cent of Australians aged 18 years and over who had used cannabis in the past 12 months were found to have high or very high levels of psychological distress as identified by the Kessler 10 (K10) Scale of Psychological Distress (AIHW 2011). This was higher than those who had not used cannabis in the past month (7%). While the 2010 NDSHS report did not include mental health information on heroin users, the 2007 report revealed much higher levels of psychological distress among heroin users when compared to cannabis users. For instance, 65 per cent of respondents who had used heroin in the month preceding the survey were found to have high or very high levels of psychological distress compared with only 10 per cent who had not used heroin and 22 per cent who had used cannabis in the past month (AIHW 2008). These population-based studies and systematic reviews are largely based on samples of the general population, but are limited in that they may exclude certain populations (such as offenders and regular drug users) who are not easily contacted but for whom issues such as these are more highly prevalent (Farrell et al. 2002).

In another study conducted by AIHW it was found that seven per cent (N=5,749) of substance use hospitalisations recorded between July 2006 to June 2008 were for “mental and behavioural disorders from the use of cannabis” (AIHW 2011). This was particularly the case for Aboriginal and Torres Strait Islander Australians whose hospitalisation for cannabis-related mental health disorders was five times as high as their non-Aboriginal and Torres Strait Islander counterparts (AIHW 2011).

In Australia there are two ongoing surveys of drug users and offenders which capture information on both mental illness and illicit drug use: The Illicit Drug Reporting System (IDRS) and the Drug Use Monitoring Program (DUMA) program. The DUMA program conducts interviews with police detainees at nine different sites across Australia; the IDRS conducts interviews with regular injecting drug users in the capital cities of every Australian jurisdiction. In a recent study of mental illness among IDRS participants, little difference was found in the prevalence of cannabis use between those who self-reported having a mental illness and those who did not (84% versus 82% respectively) (deGraaff & Bruno 2010). However there is a particularly high prevalence of drug use and polydrug use among the IDRS sample, which is likely to have confounded these results. A UK survey of prisoners found that severe cannabis dependence was associated with an increased risk of psychosis (Farrell et al. 2002), and that there is a need for further research into mental illness and cannabis use among offender populations in Australia using evidence-based psychological measures.

Method

Data for this Bulletin were collected as part of the Australian Insitute of Criminology's DUMA program, a self-report survey of drug use and criminal offending among police detainees who had been charged by police (but not yet convicted). DUMA has operated continuously for over 13 years and data collection occurs at nine sites across Australia (Sweeney and Payne 2011). The results are used to inform the development of strategic responses to new and emerging drug/crime issues. Further information about DUMA and its methodology can be found elsewhere (Makkai 1999).

Specifically, the data used in this Bulletin are derived from five data collection sites in quarters 1 and 4 of the DUMA quarterly collection in 2010 - Southport and Brisbane (Queensland), Bankstown and Kings Cross (New South Wales) and East Perth (Western Australia). A total of 1,873 adult detainees were interviewed; 84 per cent were male and 16 per cent were female.

Measuring cannabis use

To obtain information about cannabis use, police detainees interviewed through the DUMA program were first asked whether they had ever tried cannabis. To measure frequency of cannabis use, detainees were asked "During the last 30 days, on how many days did you use cannabis?" Another aspect of the DUMA survey is the collection and analysis of urine samples from police detainees. While most of the analyses in this paper are based on self-report measures of cannabis use, urinalysis results are regularly used to confirm interview responses to the DUMA survey, showing self-report data to be reasonably reliable.

Measuring mental illness

As indicated earlier, the Corrections Mental Health Screen (CMHS) was administered in DUMA as an addendum of pilot questions in 2010. The aim was to identify individuals who were likely (according to the screening tool) to be experiencing a mental health-related disorder and who were, therefore, in need of more comprehensive psychological assessment. It should be noted here that the most accurate means for measuring the prevalence of mental illness would be to conduct comprehensive diagnostic interviews with all detainees; however, given the scope of the DUMA survey and the limitations imposed by the interview process, it was neither possible nor practical for full diagnostic interviewing to occur. It is for these reasons the CMHS has been recommended by the US National Institute of Justice (NIJ) as an appropriate mental health screening tool for correctional settings in which the full diagnostic interviewing is cost prohibitive and impractical (Ford et al. 2007). Evaluation of the CMHS has shown a relatively high degree of accuracy – with one study estimating that 75 per cent of inmates in US prisons who were assessed by the CMHS as in need of further psychological assessment were later diagnosed with a mental health-related disorder (Goldberg & Higgins 2006). In particular, the CMHS has been shown to be particularly successful in identifying individuals with specific disorders such as depression, anxiety, post-traumatic stress disorder (PTSD), some personality disorders and presence of any undetected mental illness (Ford et al. 2007).

A key advantage of the CMHS is that it contains a set of different questions for males and females, recognising the gender differences in both the aetiology and presentation of mental illness. The questions have been standardised and validated for screening of mental disorder among newly incarcerated adults (Ford et al. 2009). The male version (CMHS-M) includes twelve questions about current and lifetime indications for serious mental illness and the female version (CMHS-F) includes eight questions of a similar nature. The NIJ recommends that males who answer 'yes' to six or more questions and females who answer 'yes' to five or more questions are likely to be experiencing a mental health-related disorder and should be referred for further psychological assessment. These individuals are herein referred to as having 'scored above the cut off' and 'in need of further psychological assessment or treatment'.

It should be noted that the CMHS is not a diagnostic measure of mental illness, but rather a screening tool used to detect probable mental illness and the need for further psychological assessment and/or treatment. In addition, the experience of being arrested and detained at police watch houses may exacerbate the stress levels among detainees and lead them to score higher on the CMHS screening tool than they normally would during interviews. Thus those who *scored above the cut off* for being in need of further psychological assessment may be over-represented in the sample, regardless of whether they used cannabis or not.

Results

Cannabis use among police detainees

Whether measured by self-report or by urinalysis, cannabis is typically the illegal drug most commonly used among police detainees (Sweeney & Payne 2011). In these data, (Quarter 1 and 4, 2010) almost half of all police detainees (48%) self-reported having used cannabis in the past 30 days, while an almost equal percentage of those who voluntarily provided a urine sample tested positive to cannabis (45%) (see Table 1).

Table 1: Indicators of cannabis use among police detainees surveyed Quarter 1 2010

	All detainees		Males		Females	
	n	%	n	%	n	%
Ever used	1,550	83	1,314	84	236	79
Used in last 30 days	807	48	692	49	115	42
Did not use in last 30 days	886	52	730	51	156	58
Tested positive for cannabis[a]	616	45	524	46	92	44
Did not test positive for cannabis	740	55	624	54	116	56
Frequency of cannabis use in past 30 days						
1–3 times	249	31	220	32	29	25
4–11 times	170	21	138	20	32	28
12 or more times	388	48	334	48	54	47
Total	1,694	100	1,423	84	271	16

Source: AIC DUMA Quarter 1 2010 [Computer file]
[a]Of those who provided a urine sample.

Of those who self-reported using cannabis in the past 30 days, the frequency of use was generally high. Nearly half of all cannabis-using detainees reported regular use; defined here as the use of cannabis on 12 or more of the past 30 days (equivalent to an average of three or more times per week). There was little difference in this proportion between female detainees (47%) and male detainees (48%).

Irregular cannabis use was not uncommon however, with one in three (32%) male detainees and one in four (25%) female detainees having used cannabis (only) less than four times in the past 30 days (less than once a week on average).

Mental health status of cannabis users

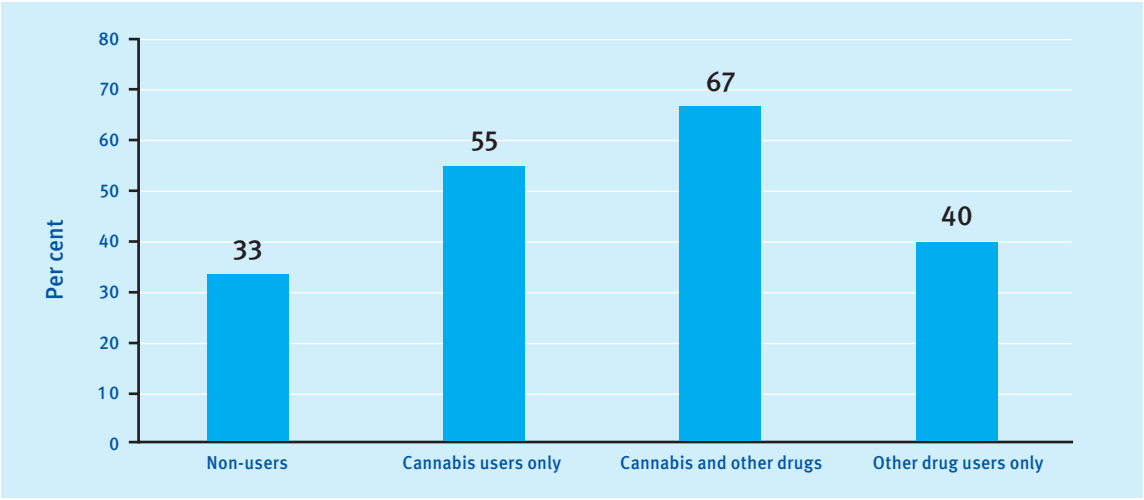
Approximately half of all detainees interviewed as part of the DUMA program scored above the cut off in the CMHS and were, therefore, perceived to be in need of further psychological

assessment. In this study, female detainees were more likely than male detainees to have scored above the relevant cut offs (60% vs. 51% respectively).

Those detainees who self-reported any illegal drug use in the 30 days prior to their arrest were more likely to be assessed as needing detailed psychological assessment, although the frequency at which detainees scored above the relevant cut off varied by drug type. For example, 55 per cent of male detainees who had been using cannabis only in the past 30 days scored above the cut off, as did 67 per cent of males who had been using both cannabis and other drugs concurrently. This compares with 40 per cent of males who used other drugs only and 33 per cent of males who had not been using any drugs in the past 30 days.

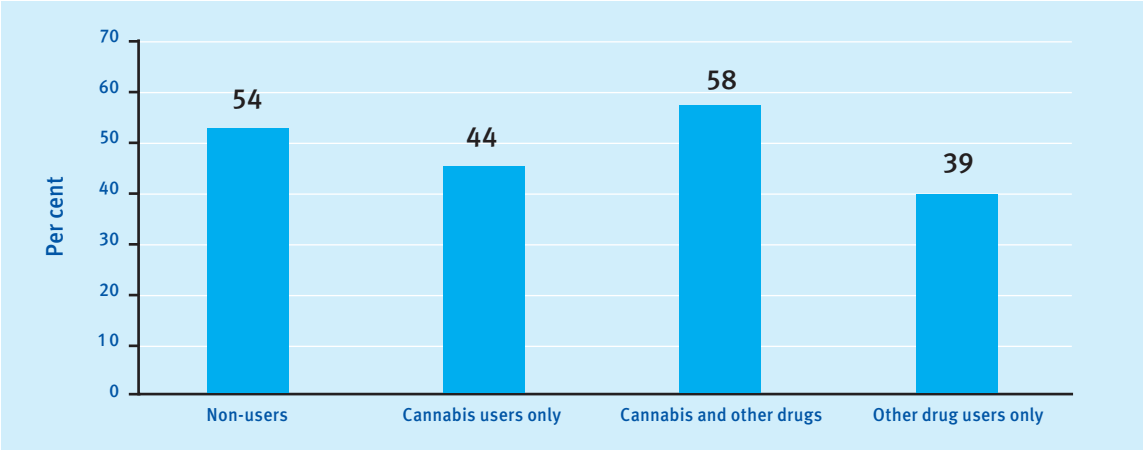
For female detainees, further psychological assessment was deemed appropriate for 44 per cent of those using cannabis only in the past 30 days; 58 per cent of those who were using both cannabis and other drugs; and 39 per cent of those who had been using other drugs only. In comparison, 54 per cent of women who had not been using any drugs in the past 30 days were assessed by the CMHS as requiring further psychological assessment.

Figure 1: Male detainees who scored above the cut off for having unmet mental health need by user type



*Differences between groups are statistically significant (X2(3)=8.8, p=0.03)
Source: AIC DUMA Quarter 1 2010 [Computer file]

Figure 2: Female detainees who scored above the cut off for having unmet mental health need by user type



*Differences between groups are statistically significant (X2(3)=50.1, p=0.00)
Source: AIC DUMA Quarter 1 2010 [Computer file]

On these figures alone, the link between cannabis use and mental health is difficult to disentangle. In the first instance, male cannabis-only users are more likely than non-users of any drug to be assessed as in need of further psychological assessment, yet so too are those who are using other drugs and not cannabis. Further, those who are using cannabis *and* other drugs combined, appear more likely to require further psychological assessment than either non-users of any drug, cannabis-only users, and in the case of female detainees, other drug-only users. Furthermore, female users of cannabis and other drugs are more likely than those who are using cannabis only or other drugs only to be assessed as in need of further psychological assessment, yet non-using females are more likely than cannabis-only users to score above the cut off. It is difficult, therefore, to conclude whether the recent use of cannabis, irrespective of other drug use, is an important indicator of probable mental health-related disorders, since the use of other drugs may confound the independent role played by cannabis in mental health.

To disentangle this complex story, a logistic regression model was constructed to identify the independent effect of individual drug types on the probability that a police detainee (male or female) would be assessed as needing comprehensive psychological assessment. Logistic regression is a multivariate technique that examines the link between each drug type and mental health, while holding constant the effect of gender and all other drug types the detainee may have also been using. It allowed identification of whether having been a user of cannabis in the past 30 days remains an important independent predictor of whether detainees would later be identified as having a probable mental health disorder.

The results of the logistic regression modelling are presented in Table 2. They illustrate that two drug types – cannabis and amphetamines – were statistically linked to scoring above the cut off in the CMHS. For cannabis, users were 1.5 (p=0.00) times more likely than non-users to score above the cut off irrespective of any other drug type they may have been using. Similarly, amphetamine users were 1.6 (p=0.00) times more likely than non-amphetamine users to score above the cut off; while heroin use (p=0.08), cocaine use (p=0.41), other illegal opiate use (p=0.67) and illegal benzodiazepine use (p=0.07) all failed to reach conventional levels of significance. This suggests that once cannabis and amphetamine use had been accounted for, these other drug types failed to further differentiate between those who were in need of further psychological assessment and those who were not.

Finally, it is important to note that logistic regression coefficients are additive, and since all drug types resulted in positive coefficients (though not always significant) the model implies that polydrug use is perhaps the most important indicator of all that a detainee is suffering a mental health-related disorder. Users of both cannabis and amphetamines are, for example, 2.5 times as likely as non-users of both drugs to be identified as needing further psychological assessment.

Table 2: Logistic regression predicting need for further psychological assessment (Model 1)

	b	or	p
Illegal drugs used in the past 30 days			
Cannabis	0.46	1.59	**0.00**
Amphetamines	0.49	1.63	**0.00**
Heroin	0.41	1.50	0.08
Cocaine	0.25	1.29	0.41
Other opiates	0.14	1.15	0.67
Benzodiazepines	0.46	1.59	0.07
Constant	0.25	n/a	0.45

Note: Model also controls for gender, site of interview and quarter of interview.
Model summary: n=1355, Model x2(15)=81.64, Model p=0.00, Hosmer and Lemeshow p=0.26, AUC=0.64
Source: AIC DUMA Quarter 1 2010 [Computer file]

A practical interpretation of the outcomes of the logistic regression modelling may be that with knowledge about recent cannabis and amphetamine use, law enforcement and other criminal justice practitioners may be better able to identify detainees suffering from mental health-related disorders and apply, where appropriate, the relevant protocols and diversion options. For health and treatment practitioners, the results suggest that cannabis and amphetamine use may be important indicators of the need for tailored treatment and rehabilitation programs that involve psychological assessment and ongoing psychological counselling.

However, simply knowing whether a detainee used cannabis in the past 30 days may not be sufficient to direct treatment programs or diversion options since, even in the criminal justice system, cannabis users are not a homogenous population. Some users, for example, use cannabis relatively infrequently, while others use cannabis almost daily. The frequency of cannabis use may provide additional information that helps practitioners to understand the links to mental health.

Preliminary descriptive analysis points to a positive relationship between the frequency of recent cannabis use and the likelihood of being assessed as needing comprehensive psychological assessment. Tables 3 and 4 show the proportion of detainees scoring above the cut off on the CMHS for three categories of cannabis users: those who had used less than once a week (1-3 times in the past 30 days); those who had used cannabis at least once a week, but less than three times a week (4-11 times in 30 days); and those who had been using cannabis on three or more days each week (12 or more times in 30 days). For both male and female detainees, the more frequently cannabis was used, the more likely it was they would be identified as needing comprehensive psychological assessment. For example, 64 per cent of males and 78 per cent of females who were using cannabis three or more times a week on average scored above the cut off on the CMHS. This compared with 53 per cent of males and 60 per cent of females who had used cannabis less than once a week. For females, the number of responses was particularly low and the results should be viewed with caution.

Building on the earlier logistic regression model, a second model was developed to identify whether, after controlling for other drugs being used, the risk associated with cannabis use was evenly shared by all cannabis users, or whether the frequency of recent use added additional information to the model. Table 5 presents the results and shows that heavy users of cannabis (three or more days per week) were 1.6 times more (p=0.02) likely than infrequent cannabis users and 1.9 times more likely (p=0.01) than moderate users of cannabis to be in need of comprehensive psychological assessment. There was no difference between moderate users and infrequent users of cannabis (p=0.49) once the use of other drugs had been taken into account. Finally, infrequent (or=1.33, p=0.09) and moderate cannabis users (1.14, p=0.51) were not statistically different from non-cannabis users in their likelihood of scoring above the CMHS cut off, whereas frequent cannabis users were 2.1 times more likely than non-cannabis users to be in need of further psychological assessment.

Table 3: Males: Frequency of cannabis use in past 30 days

	1–3 times		4–11 times		12+ times	
	n	%*	n	%	n	%
Scored above cut off	98	53	58	47	188	64
Scored below cut off	86	47	65	53	105	36
Total	184	100	123	100	293	100

Source: AIC DUMA Quarter 1 2010 [Computer file]
* Note: Due to particularly small numbers in this analysis percentages should be viewed with caution.

Table 4: Females: Frequency of cannabis use in past 30 days

	1–3 times		4–11 times		12+ times	
	n	%	n	%	n	%
Scored above cut off	12	60	13	65	35	78
Scored below cut off	8	40	7	35	9	20
Total	20	100	20	100	44	100

Source: AIC DUMA Quarter 1 2010 [Computer file]

Table 5: Logistic regression predicting need for further psychological assessment (Model 2)

	b	or	p
Drugs used in the past 30 days			
Cannabis	0.29	1.33	0.09
Amphetamines	0.45	1.57	**0.00**
Heroin	0.40	1.49	0.09
Cocaine	0.28	1.32	0.37
Other opiates	0.18	1.19	0.59
Benzodiazepines	0.42	1.52	0.10
Frequency of recent cannabis use in past 30 days			
1–3 times (less than weekly)		reference	
4–11 times (1–3 times a week)	–0.16	0.85	0.49
16–30 times (4+ times a week)	0.46	1.59	**0.02**
Constant	0.30	n/a	0.36

Note: Model also controls for gender, site of interview and quarter of interview.
Model summary: n=1355, Model x2(17)=91.75, Model p=0.00, Hosmer and Lemeshow p=0.22, AUC=0.65
Source: AIC DUMA Quarter 1 2010 [Computer file]

Discussion

The current study focused on a sample of 1873 police detainees surveyed as part of the DUMA program during 2010. Using self-reported measures of recent cannabis use, together with results from the CMHS, it appears that cannabis use is a statistically significant and independent predictor of the likelihood that a police detainee will be assessed as having a probable mental health-related disorder requiring further psychological assessment. Indeed, the probability of screening using the CMHS was highest for frequent cannabis users, even after controlling for the extent of other drug use. Though the CMHS does not provide a full diagnostic assessment, these data from the DUMA program reinforce concerns about the links between cannabis use and mental illness among criminal offending populations.

However, it is important to recognise that these findings do not provide proof that cannabis use is an underlying cause of mental illness among detainee populations. It is not known, for example, to what extent mental illness preceded the first and regular use of cannabis, or to what extent current cannabis use exacerbates (or mediates) a pre-existing mental health condition. The correlations presented here suggest only that cannabis use remains an important indicator of the presence of a probable mental health disorder – information that can assist the targeting of early intervention policies and practices.

With regard to the criminal justice system, the correlation between cannabis use and mental illness has obvious implications for diversion and treatment programs that operate through the

courts and corrective services sectors. Diverting offenders into drug treatment with little or no regard to the presence of other mental health-related issues may limit program effectiveness. Dealing only with cannabis dependency without the provision of concurrent mental health-related services may reduce the long-term benefits and investment in comprehensive drug diversion and treatment. The current findings suggest that for frequent cannabis users, the effectiveness of drug diversion programs could be enhanced by the inclusion of mental health assessment and treatment conducted in conjunction with drug abstinence and other drug treatment programs.

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