



Australian Government

Australian Institute of Criminology

CRIME & JUSTICE RESEARCH 2021

Edited by Michael Phelan APM

Australian Institute of Criminology

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About the editor

Michael Phelan APM was appointed Chief Executive Officer of the Australian Criminal Intelligence Commission (ACIC) and Director of the Australian Institute of Criminology (AIC) on 13 November 2017.

As CEO of the ACIC, Mr Phelan is responsible for ensuring delivery of national policing information systems and services to Australian police and law enforcement partners. He is also responsible for management and administration of the ACIC's intelligence operations and specialist capabilities.

As Director of the AIC, Mr Phelan is responsible for leading Australia's national research and knowledge centre on crime and justice.

Mr Phelan was appointed to the Australian Federal Police (AFP) in 1985 and during his career has worked in a variety of fields, including community policing, narcotics and serious fraud.

In September 2007, Mr Phelan was appointed as the Chief Police Officer for the Australian Capital Territory and in 2010 was promoted to Deputy Commissioner, taking up the role of Deputy Commissioner Close Operations Support, overseeing the portfolios of High Tech Crime, Forensics and Intelligence.

In July 2013, Mr Phelan commenced as Deputy Commissioner Operations, where he was responsible for the Crime Operations and Serious and Organised Crime portfolios including the AFP's overseas network of agents.

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Mr Phelan has previously held positions on the Boards of the Australian Crime Commission, CrimTrac and the Australia New Zealand Policing Advisory Agency. Mr Phelan also served as a member of the ACT Law Reform Advisory Council and the Australian National Advisory Council on Alcohol and Drugs.

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Introduction

The nature of crime in Australia has always evolved in response to changing circumstances, and this has continued to be the case in 2021. When I wrote the introduction to the first compendium in 2019, I could not have foreseen the impact that COVID-19 would have on crime or the huge efforts criminal justice policymakers and practitioners would put into responding to the pandemic. Although COVID-19 was not a formal research priority for the Australian Institute of Criminology (AIC), it has shaped much of the Institute's recent work. This compendium, which brings together 21 recent research studies published by the AIC, starts with five chapters that outline ways in which COVID-19 has influenced crime. These projects, all conducted rapidly, provided some of the most robust available evidence on how crime was affecting our community during the pandemic.

Chapters 1 and 2 report on the findings from an online survey of 15,000 women conducted in May 2020, which provided a snapshot of experiences of domestic violence during the early stages of the pandemic. The results show that around one in 10 women experienced some form of physical or sexual violence from their partner in the three months prior to May and two-thirds of those women reported experiencing violence for the first time, or escalating violence. A more in-depth examination of the findings (in chapter 2) shows that both social isolation from friends and family and increased financial stress exacerbated domestic violence during this period.

Chapter 3 explores the availability of COVID-19 related medical products such as personal protective equipment and antiviral medications on the darknet at the start of April 2020. It demonstrates that relatively few products were available at that point and most were found on just three darknet markets. Chapter 4 explores how online gambling changed as people spent more time indoors during the lockdown. Most significantly, it shows how the amount spent on online gambling increased between March and April 2020 and those living as a couple with children emerged as a group that were spending more. One notable change to emerge from the pandemic was a temporary reduction in methamphetamine supply in Perth. Chapter 5 describes how drug users reported a decline in availability and an increase in price, which led them to consume methamphetamine less frequently.

While crime is constantly changing, there are some perennial problems that have proven difficult to address and these are reflected in the Institute's priorities. The remainder of the compendium deals with some of these priorities, with a focus on understanding problems and developing workable solutions. The topics addressed include violence against women and children, transnational serious and organised crime, illicit drugs and youth crime.

Chapter 6 describes applied research on domestic violence which helped ACT Policing to refine its risk assessment tool from 37 items to just 10, while also improving the tool's validity. This is expected to result in a saving in police time and improved targeting. Chapter 7 explores the nature of repeat domestic violence in Australia and proposes a focused deterrence model that has been highly successful in addressing other forms of violence and has been used to reduce domestic violence in the United States. Two chapters also address child sexual abuse. Chapter 8 describes an innovative use of financial transactions data to understand the purchasing habits of Australians who viewed live streamed child sexual abuse, demonstrating an escalation in both frequency and severity of offending over time. Chapter 9 is one of the first papers to be published from the AIC's Child Sexual Abuse Material Reduction Research Program and describes a new treatment program that has been developed for child exploitation material offenders.

Chapters 10 and 11 describe some of the emerging work from the AIC's Serious and Organised Crime Research Laboratory, which aims to use a crime science approach to understanding and reducing organised crime. Chapter 10 describes the findings from a systematic review of the literature to demonstrate the pathways into organised crime. Chapter 11 presents an analysis of the criminal histories of over 5,000 outlaw motorcycle gang members, showing the harm they cause to the community through both organised crime and violence.

Chapters 12 to 17 represent the AIC's recent research focused on understanding and reducing illicit drug markets. Taken together, chapters 12 to 14 provide an important evidence-based narrative that supports law enforcement efforts to reduce the supply of illicit drugs, showing the range of community benefits that result from supply reduction and indicating the types of local law enforcement measures that are most effective.

Chapters 15 and 16 examine concerning trends in the availability of the powerful synthetic opioid fentanyl in the illicit drug market. Data from the AIC's Drug Use Monitoring in Australia program reveals emerging evidence suggesting that some drug users may unwittingly be using methamphetamine laced with fentanyl. Chapter 16 examines the availability of illicit fentanyl on darknet markets, uncovering over 300 vendors selling over 1,000 fentanyl related products.

Chapter 17 examines the relationship between methamphetamine dependence and domestic violence, finding that those who are dependent on the drug are much more likely than other users to perpetrate domestic violence.

The final section of the compendium describes a program of work focused on youth justice. Chapter 18 shows how children with experience of being in care tend to have worse outcomes in the justice system than other children, often due to a range of complex needs. Chapter 19 shows that Indigenous young people tend to have greater contact with the justice system than non-Indigenous young people, resulting in higher costs to the system due to more frequent contact and longer and more serious sanctions. Chapter 20 explores what can be done to improve youth offender programs and identifies nine important design, delivery and implementation factors that need to be taken into account. Finally, chapter 21 draws out the common themes from a number of inquiries and royal commissions, highlighting the ways in which the youth justice system could be improved.

This compendium gives a snapshot of just some of the many studies that have recently been completed by the AIC. Developed in association with stakeholders at both the Commonwealth and state and territory level, these projects are informing crime and justice policy in Australia by producing timely, robust and accessible evidence—all essential hallmarks of the research being undertaken and disseminated by the AIC.



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Australian Institute of Criminology



COVID-19 pandemic

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1. The prevalence of domestic violence among women during the COVID-19 pandemic

Hayley Boxall, Anthony Morgan and Rick Brown

Since the first case of the novel coronavirus (COVID-19) was confirmed in Australia in January 2020, both the disease and the measures implemented to limit its spread have had significant impacts on the day-to-day lives of Australians. In the past few months there have been numerous media reports about the risks to the safety of victims of domestic violence (intimate partner violence), including concerns about an increase in violence, more complex forms of violence, and the impact of social distancing measures on the ability of victims to seek help (Morton 2020; Nancarrow 2020; Pfitzner, Fitz-Gibbon & True 2020). Various factors have been identified as contributing to a potential increase in both the prevalence and severity of domestic violence during the COVID-19 pandemic, including:

- victims and offenders spending more time together;
- increased social isolation and decreased social movement, which may restrict avenues for women to seek help;
- increased situational stressors associated with domestic violence (eg financial stress and job insecurity);
- offenders feeling out of control due to situational factors and using violence and abuse as a means of creating a sense of control; and
- increased alcohol consumption among domestic violence perpetrators (Delaney 2020; Morton 2020; Nancarrow 2020; Payne, Morgan & Piquero 2020).

Contrary to international research (Ashby 2020; Jaramillo 2020; Mohler et al. 2020), recent Australian evidence from New South Wales and Queensland suggests that domestic violence reported to the police did not increase in March or April 2020 (Freeman 2020a, 2020b), nor did the number of protection order breaches (Payne, Morgan & Piquero 2020). Although some Australian domestic violence and men's behaviour change services have reported an increase in calls for support since February 2020, other service providers have reported a decrease or no change in their client numbers (Gleeson 2020; Morton 2020; Pfitzner, Fitz-Gibbon & True 2020; Tuohy 2020; Women's Safety NSW & Foundation for Alcohol Research & Education 2020).

There is a lack of research into the prevalence of domestic violence among Australian women since the start of the COVID-19 pandemic. Given the majority of women experiencing violence and abuse within their relationships do not engage with police or government or non-government agencies—particularly while they remain in a relationship with their abuser—this is a significant gap in knowledge (ABS 2017). Relatedly, there are concerns that opportunities for women to contact and engage with domestic violence services or the police have been even more constrained during periods when social movement was restricted (Fitz-Gibbon & Meyer 2020). There are particular concerns about the safety of women experiencing coercive controlling behaviour (Pfitzner, Fitz-Gibbon & True 2020).

To address these emerging issues, we set out to answer the following questions:

- What was the prevalence and nature of domestic violence experienced by Australian women during the initial stages of the COVID-19 pandemic?
- What causal mechanisms may explain any observed relationship between the COVID-19 pandemic and domestic violence?

This chapter focuses on the first of these questions.

Method

This chapter presents the results of an online survey of 15,000 women aged 18 years and over. Respondents were asked about their experience of domestic violence in the last three months, as well as their experience of prior domestic violence. The aim was to measure the prevalence of violence since the beginning of February 2020, when COVID-19 first started impacting Australia. The focus of this study was on women's experience of violence, given the overwhelming evidence that women are over-represented as victims of domestic violence (ABS 2017) and domestic homicide (Bricknell 2020), experience significant harms associated with domestic violence (AIHW 2019), and were expected to be disproportionately affected by violence in the home during the pandemic (Pfitzner, Fitz-Gibbon & True 2020).

Domestic violence is defined here as physical violence, sexual violence and emotionally abusive, harassing or controlling behaviour involving intimate partners. This includes attempted behaviours and face-to-face threats. The focus of this chapter is on partner violence, which refers to physical and sexual violence and emotionally abusive, harassing or controlling behaviour that occurs within current and former cohabiting relationships. A cohabiting partner is a person the respondent lives with, or lived with at some point in the last 12 months, in a current or former married or de facto relationship.

Coercive controlling behaviours involve the micro-regulation of women's lives (Stark 2007). This can involve a range of behaviours perpetrators use as a means of controlling their partner, including frequent belittling and derogatory comments, monitoring of their whereabouts, interfering with their relationships and financial abuse. For further detail of the definitions used, see the *Technical appendix* (<https://www.aic.gov.au/publications/sb/sb28>).

The survey was conducted by i-Link Research Solutions between 6 May and 1 June 2020. It took respondents approximately 10 minutes to complete. There were several important measures in place to ensure the safety of respondents (see the *Technical appendix*). The survey was sent to female members of the research company's online panel aged 18 years or over. Proportional quota sampling, a non-probability sampling method, was used. Data were subsequently weighted by age and jurisdiction to reflect the spread of the Australian population using data from the Australian Bureau of Statistics (ABS 2019) on the estimated resident population as at June 2019. All data presented in this chapter are weighted. Although the sample was not weighted by other sociodemographic factors, comparisons with population data and estimates from nationally representative surveys indicate there was a high level of concordance between the survey sample and the wider Australian female population (see *Technical appendix*). While a large sample of women were surveyed, the use of non-probability sampling from an online panel means that not everyone had an equal likelihood of being selected to participate in the research. Results are specific to the women who participated in the survey and cannot be generalised to the wider female population.

The survey included questions about sociodemographic and relationship characteristics and women's experiences of physical or sexual violence, and emotionally abusive, harassing and controlling behaviour in the three months prior to the survey. The physical and sexual violence survey items were taken from the 2016 Personal Safety Survey (ABS 2017). Emotionally abusive, harassing and controlling behaviours were measured using items derived from the Psychological Maltreatment of Women Inventory–Short Form (PMWI-SF) Dominance–Isolation subscale (Tolman 1999). Other items relating to emotional abuse and stalking were drawn from the Personal Safety Survey and modified, and a question about technology-facilitated abuse was added. This better reflects a contemporary understanding of the emotionally abusive, harassing and controlling behaviours that characterise non-physical forms of domestic violence (Dragiewicz et al. 2018; Monckton Smith 2019; Woodlock et al. 2019).

Previous studies have developed a cut-off score using the PMWI-SF to distinguish more serious levels of psychological violence (Começanha & Maia 2018). However, the current study relied on a modified set of questions and dichotomous response items instead of questions about the frequency of behaviour. This was necessary to capture as wide a range of abusive behaviours as possible within the strict time limit imposed for safety reasons. For the purpose of this study, the presence of coercive control was determined on the basis of a respondent reporting three or more of the 13 emotionally abusive, harassing or controlling behaviours described in the survey, indicating a pattern of controlling behaviour. Our estimate of coercive controlling behaviour is likely conservative. For this reason, the prevalence of fewer than three emotionally abusive, harassing or controlling behaviours is also reported.

Further information on the methodology, key definitions, sampling strategy, safety protocols and limitations of the survey is provided in the *Technical appendix*.

Sample characteristics

In the final weighted data, 32.0 percent of respondents lived in New South Wales, 26.2 percent in Victoria, 19.9 percent in Queensland and 10.1 percent in Western Australia. Smaller proportions resided in South Australia (7.1%), Tasmania (2.2%), the Australian Capital Territory (1.7%) and the Northern Territory (0.9%). This is consistent with the ABS (2019) estimated resident population as at June 2019.

The sociodemographic characteristics of the sample are presented in Table 1. The average age of respondents was 48 years, and approximately half of the sample was below the age of 45 years at the time of completing the survey (46.2%). Nearly four percent of respondents identified as being Aboriginal and/or Torres Strait Islander (3.8%), and one in five (18.7%) said that they spoke a language other than English most of the time at home (ie were from non-English-speaking backgrounds). One in eight respondents (11.9%) had a long-term health condition which they said restricted their ability to undertake day-to-day activities unassisted.

The majority of respondents had completed Year 12 or equivalent, with two in five (42.0%) reporting that they had a university qualification. One in four (24.6%) respondents reported their usual place of residence was in a regional or remote area, while 75.4 percent were living in a major city (as defined by the ABS).

Table 1: Sociodemographic characteristics of respondents (weighted data) (n=15,000)

	<i>n</i>	%
Age		
18–24	1,689	11.3
25–34	2,770	18.5
35–44	2,466	16.4
45–54	2,378	15.9
55–64	2,178	14.5
65+	3,519	23.5
Average age (years)	47.6	
Aboriginal and/or Torres Strait Islander ^a	565	3.8
Non-English-speaking background ^b	2,799	18.7
Current long-term health condition restricting everyday activities ^c	1,778	11.9
Highest level of education completed^d		
Year 9 or below	406	2.7
Year 10/11 or equivalent	1,837	12.3
Year 12 or equivalent	2,265	15.1
Vocational certificate	4,195	28.0
University	6,296	42.0
Usual place of residence^e		
Major cities	11,315	75.4
Regional	3,330	22.2
Remote	355	2.4

a: Excludes 1 respondent who did not provide this information. Denominator includes 99 respondents who did not want to disclose this information

b: Excludes 1 respondent who did not provide this information

c: Defined as someone who said they had a health condition that had lasted or was expected to last six months or longer and, because of this condition, they were restricted in or needed help or supervision with day-to-day activities. Excludes 1 respondent who did not provide this information

d: Excludes 1 respondent who did not provide this information

e: Regional classification calculated using the respondent's postcode and concordance with the Australian Statistical Geography Standard (ABS 2018)

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Overall, 51.8 percent ($n=7,763$) of women in the sample reported that they had been in a cohabiting relationship for at least some of the 12 months prior to the survey (95.7% in their current relationship). Further, of the women who were in a cohabiting relationship with a current or former partner in the past 12 months:

- 94.8 percent said their partner was male, and 4.4 percent said their partner was female;
- 54.7 percent had at least one child with their partner (average 2.1 children);
- 40.5 percent had at least one child living with them, either full time or part time (average 1.8 children); and
- 3.6 percent said they were pregnant at the time of completing the survey (Table 2).

Table 2: Relationship characteristics of respondents who had been in a cohabiting relationship in the past 12 months (weighted data) ($n=7,763$)

	<i>n</i>	%
Relationship status		
Current partner	7,432	95.7
Former partner	331	4.3
Gender of partner		
Male	7,360	94.8
Female	344	4.4
Intersex/indeterminate	8	<1
Do not want to disclose	51	<1
Children within the relationship		
At least one child with partner	4,247	54.7
Average number of children with partner (range) ^a	2.1 (1–8)	
Pregnant at time of survey ^b	278	3.6
Any children living in household	3,147	40.5
Average number of children living in household (range) ^c	1.8 (1–8)	

Note: Limited to women who said they had been in a cohabiting relationship with a current or former partner for at least some of the 12 months prior to completing the survey

a: Limited to women who said they had at least one child with their current or former partner

b: Denominator includes 68 women who said they were not sure if they were pregnant at time of survey

c: Limited to women who said they had at least one child living with them, either full time or part time

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Results

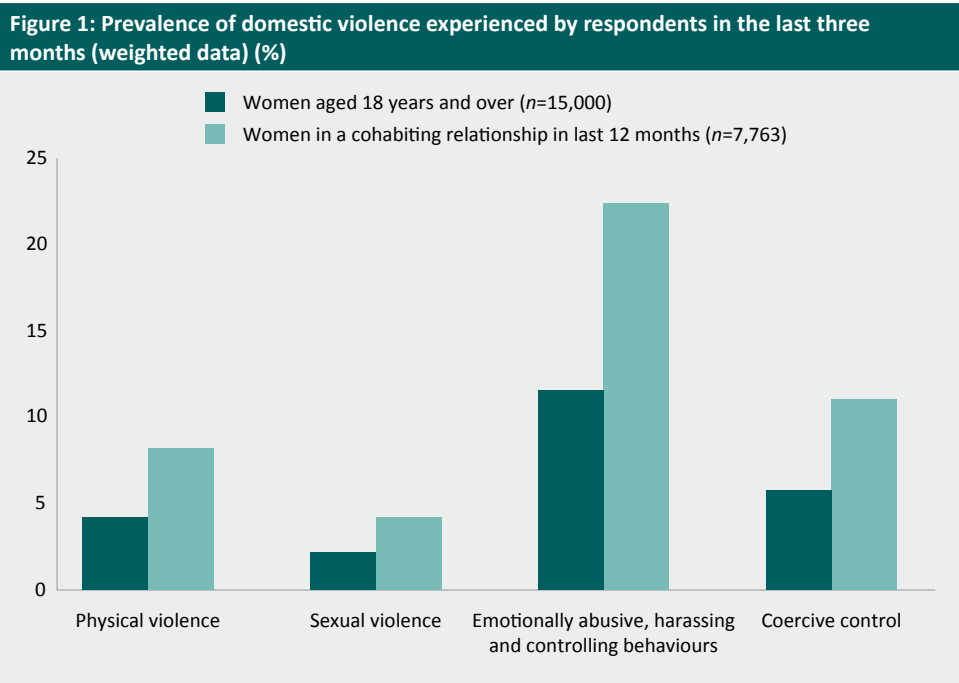
The prevalence of domestic violence among Australian women

Overall, 4.6 percent of all women who responded to the survey reported experiencing physical or sexual violence by a current or former cohabiting partner in the three months prior to the survey. This increased to 8.8 percent when the sample was limited to women who had been in a cohabiting relationship in the previous 12 months.

As shown in Figure 1:

- 4.2 percent of all women and 8.2 percent of women in cohabiting relationships experienced physical violence;
- 2.2 percent of all women and 4.2 percent of women in cohabiting relationships experienced sexual violence; and
- 11.6 percent of all women and 22.4 percent of women in cohabiting relationships experienced emotionally abusive, harassing and controlling behaviours.

Further, 5.8 percent of all women, and 11.1 percent of women in cohabiting relationships, experienced coercive control, meaning they experienced three or more forms of emotionally abusive, harassing and controlling behaviours in the three months prior to the survey. Overall, 6.8 percent of all women, and 13.2 percent of women in cohabiting relationships, experienced physical violence, sexual violence or coercive control in the three months prior to the survey.



Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Nature of domestic violence experienced by Australian women

Information about the specific forms of violence and abuse experienced by women in the three months prior to the survey is presented in Tables 3 and 4. Among women who reported they experienced physical or sexual violence in the last three months, the most common forms of violence experienced were pushing, grabbing or shoving (71.7%); having things thrown at them, slapping, biting, kicking or hitting (52.7%); and sexual violence (47.1%; Table 3). The majority of these women reported multiple forms of violence during this period (68.3%; mean=2.5).

Table 3: Physical and sexual violence experienced by respondents in the last three months (weighted data) (%)

	Overall prevalence among respondents (n=15,000)	Prevalence among respondents who experienced physical or sexual violence (n=685) ^a
	%	%
Pushed, grabbed or shoved the respondent	3.3	71.7
Threw something at the respondent that could hurt them, or slapped, bit, kicked or hit them with a fist	2.4	52.7
Forced the respondent to take part in sexual activity against their will	2.2	47.1
Choked/strangled the respondent or grabbed them around the neck	1.9	41.6
Hit the respondent with something that could hurt them, beat them, stabbed them with a knife or shot them with a gun	1.6	35.1
Physically assaulted the respondent or hurt them in any other way	2.1	45.2
At least one form of physical or sexual violence	4.6	–
More than one form of physical or sexual violence	3.1	68.3
Average number of types of physical or sexual violence experienced	–	2.5

Note: Includes threatened behaviours and face-to-face threats of physical or sexual violence

a: Limited to women who were in a cohabiting relationship and reported experiencing physical or sexual violence in the three months prior to the survey

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Among women who experienced emotionally abusive, harassing or controlling behaviour over the last three months, the most common forms of abuse reported were constant verbal abuse and insults (47.2%), jealousy or suspicion about the respondent's friends (46.2%) and monitoring their time and whereabouts (41.3%). Two-thirds of women (66.7%) reported that they had experienced more than one form of emotionally abusive, harassing or controlling behaviour in the three months prior to the survey, with victims reporting an average of nearly four (3.9) different types of emotional abuse, harassing or controlling behaviours (Table 4).

Table 4: Emotionally abusive, harassing or controlling behaviours experienced by respondents in the last three months (weighted data) (%)

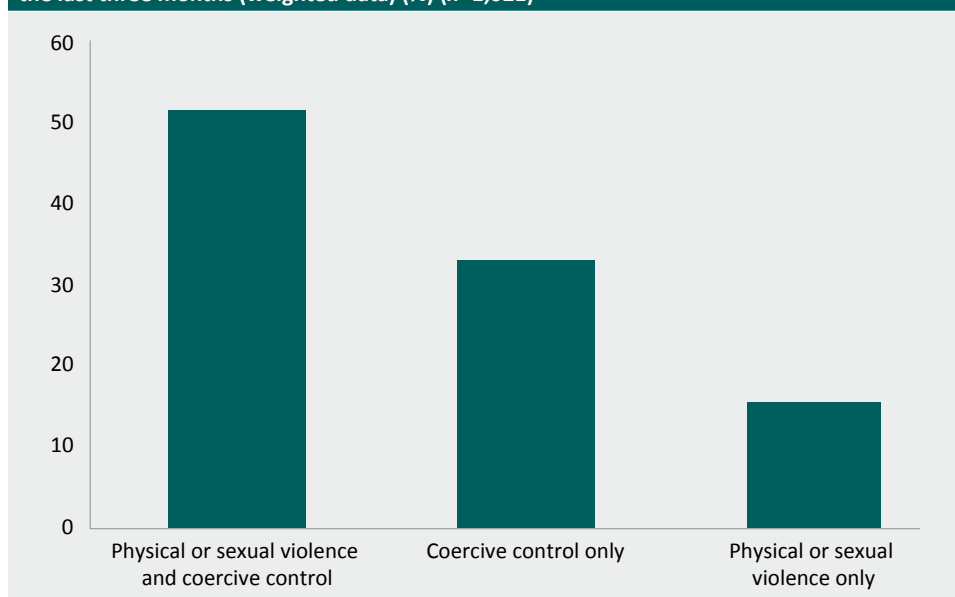
	Overall prevalence among respondents (n=15,000)	Prevalence among respondents who experienced emotionally abusive, harassing or controlling behaviour (n=1,737) ^a
Constantly insulted the respondent to make them feel ashamed, belittled or humiliated; or shouted, yelled or verbally abused the respondent to intimidate them	5.5	47.2
Was jealous or suspicious of the respondent's friends	5.4	46.2
Monitored the respondent's time and made them account for their whereabouts	4.8	41.3
Used the respondent's/shared money or made important financial decisions without talking to them	4.7	40.2
Interfered with the respondent's relationships with other family members	3.9	33.8
Accused the respondent of having an affair	3.3	28.5
Tried to keep the respondent from doing things to help themselves	2.8	24.3
Threatened to hurt themselves	2.7	23.5
Damaged, destroyed or stole the respondent's property	2.7	23.4
Threatened or abused respondent online or through the use of technology (eg mobile phone)	2.7	22.9
Stalked the respondent online or in person	2.6	22.3
Restricted the respondent's use of their phone, the internet or the family car	2.6	22.2
Threatened to hurt the respondent's family, friends, children and/or pets	2.1	17.9
At least one form of emotionally abusive, harassing or controlling behaviour	11.6	—
More than one form of emotionally abusive, harassing or controlling behaviour	7.7	66.7
Three or more forms of emotionally abusive, harassing or controlling behaviour (coercive control)	5.8	49.7
Average number of emotionally abusive, harassing or controlling behaviours	—	3.9

a: Limited to women who were in a cohabiting relationship and reported experiencing emotionally abusive, harassing or controlling behaviour in the three months prior to the survey

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Many women reported experiencing multiple forms of physical or sexual violence and emotionally abusive, harassing or controlling behaviour in the last three months. However, it was also common for women to report experiencing both coercive control and physical or sexual violence (Figure 2). Among women who experienced either physical or sexual violence or coercive control ($n=1,021$; 6.8% of respondents), half (51.6%) reported experiencing both forms of abuse. By comparison, experiencing physical or sexual violence (15.5%) or coercive control (32.9%) in isolation was less common. Further, of those women who experienced coercive control, 61.1 percent also reported physical or sexual violence. Relatedly, of women who reported physical or sexual violence, 76.9 percent also reported coercive control. This highlights the complex nature of the domestic violence that many respondents experienced.

Figure 2: Co-occurrence of physical or sexual violence and coercive control among women in the last three months (weighted data) (%) ($n=1,021$)

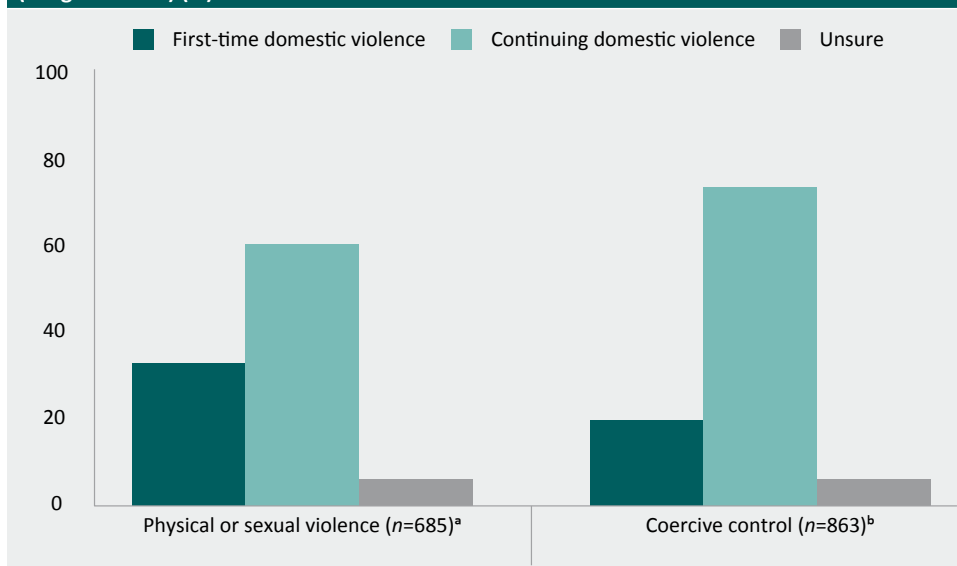


Note: Limited to women who were in a cohabiting relationship and reported experiencing physical or sexual violence or coercive control in the three months prior to the survey

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Among those women who reported they had experienced physical or sexual violence in the three months prior to the survey, one in three (33.1%) said that this was the first time their partner had been violent towards them. Similarly, 19.9 percent of women who had experienced coercive control said that this was the first time they had experienced emotionally abusive, harassing or controlling behaviour within their relationship (Figure 3). Overall:

- 1.5 percent of all women and 2.9 percent of women in cohabiting relationships had been a victim of physical or sexual violence by a current or former cohabiting partner *for the first time* in the last three months.
- 2.8 percent of all women and 5.4 percent of women in cohabiting relationships experienced emotionally abusive, harassing or controlling behaviour by a current or former cohabiting partner *for the first time* in the last three months.
- 1.1 percent of all women and 2.2 percent of women in cohabiting relationships experienced coercive control by a current or former cohabiting partner for the first time in the last three months, meaning they had not experienced emotionally abusive, harassing or controlling behaviour prior to February 2020.

Figure 3: Prior domestic violence, by type of violence experienced in the last three months (weighted data) (%)

Note: Limited to women who were in a cohabiting relationship and reported that they had experienced domestic violence in the three months prior to the survey. Percentages may not total 100 due to rounding of weighted figures

a: Total includes 41 women who were unsure whether they had experienced physical or sexual violence prior to February 2020

b: Total includes 51 women who were unsure whether they had experienced emotionally abusive, harassing or controlling behaviour prior to February 2020

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

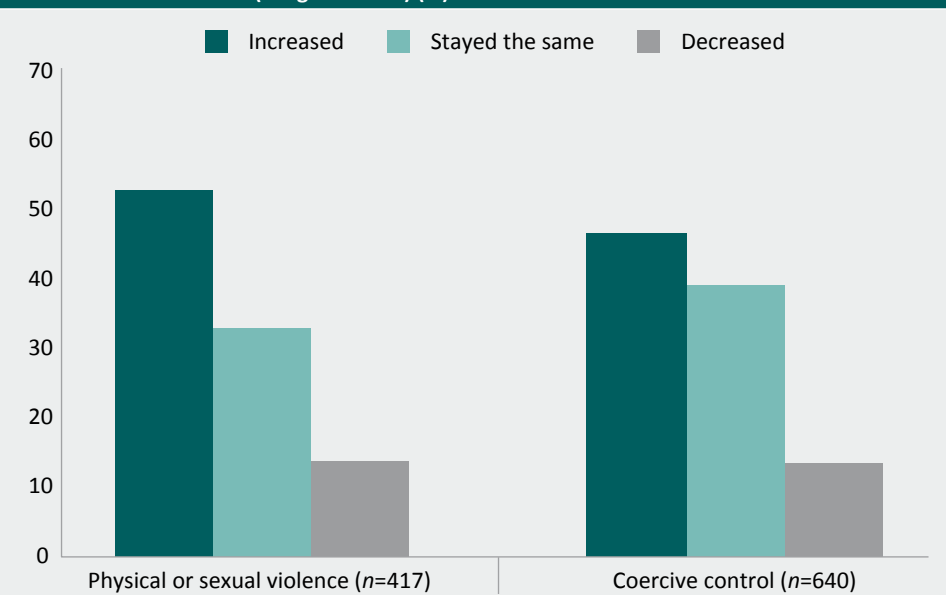
Changes in the frequency or severity of domestic violence

The COVID-19 pandemic coincided with the onset of domestic violence for many women. However, most women who experienced domestic violence in the three months prior to the survey said they had also experienced physical or sexual violence or coercive control (or both) by their partner prior to February 2020. Women who reported violence as ongoing were also asked whether the frequency and severity of violence had increased, decreased or stayed the same, relative to the six-month period prior to February 2020.

Among women who had experienced physical or sexual violence from their current or former cohabiting partner prior to February 2020, half (53.1%) said the violence had increased in frequency or severity (Figure 4). One in three women (33.1%) reported that the violence had stayed the same, and a minority said that it had decreased (13.9%). Further, 47.0 percent of women who experienced coercive control before and after February 2020 said the abuse had increased in frequency or severity, 39.3 percent said it had remained the same and 13.7 percent said it had decreased.

Overall, this means that 65.4 percent of women who experienced physical or sexual violence from a current or former cohabiting partner in the three months prior to the survey had experienced either violence for the first time by that partner or an escalation in the frequency and severity of prior violence. Similarly, 54.8 percent of women who experienced coercive control from a current or former cohabiting partner in the three months prior to the survey said either that they had experienced emotionally abusive, harassing or controlling behaviour by that partner for the first time, or that the abuse had escalated since February 2020.

Figure 4: Changes in the frequency or severity of physical or sexual violence or coercive control among women who had experienced prior domestic violence, by type of violence experienced in the last three months (weighted data) (%)



Note: Limited to women who reported they were in a cohabiting relationship in the past 12 months, had experienced domestic violence in the three months prior to the survey and had experienced violence or abuse from their partner prior to February 2020. Respondents could report experiencing both physical or sexual violence and coercive control

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Help-seeking among women who experienced domestic violence

Women who experienced physical or sexual violence in the three months prior to the survey were asked whether police had been notified about the most recent incident, either by them or by someone else. Two in five (42.1%) women reported that the police had been notified after the most recent incident of physical or sexual violence. Specifically, one in three women (31.2%) said they had called the police, while another 10.9 percent said that someone else had notified the police. More than half (56.0%) said that the police had not been notified following the most recent incident (2.0% were unsure whether police had been notified).

Women who experienced physical or sexual violence or coercive control in the three months prior to the survey were also asked whether they had sought support or advice in relation to their partner's behaviour at any time in the three months prior to the survey. Sources of support included the police, government and non-government support services, and informal sources (eg family members and spiritual leaders). They were not asked whether someone else had sought help or support on their behalf.

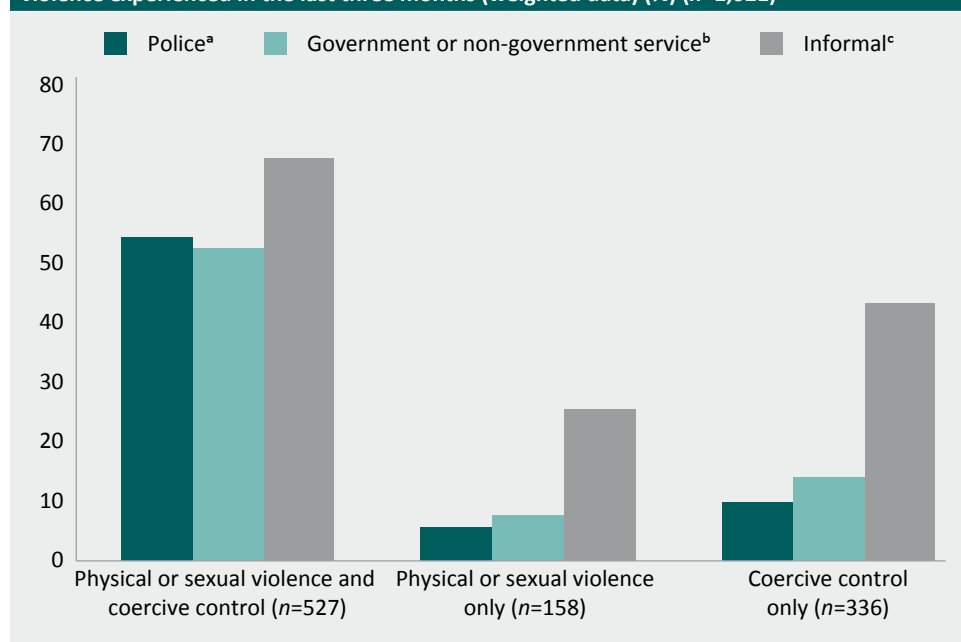
Among women who had experienced both physical or sexual violence and coercive control, 54.1 percent said they had contacted the police, 52.5 percent sought support from a government or non-government service and 67.7 percent said they reached out to informal sources of support (Figure 5). Around one in five women (22.3%) who experienced both physical or sexual violence and coercive control in the three months prior to the survey had not sought help from formal or informal sources of support.

Much smaller proportions of women who had experienced physical or sexual violence but not coercive control sought help from the police (5.8%), government or non-government services (7.8%) or informal sources of support (25.6%). Two-thirds (67.1%) of these women had not sought help from any source over the last three months.

Similarly, only a small proportion of women who experienced coercive control but not physical or sexual violence had contacted police over the last three months (10.0%). Around one in seven (14.1%) sought help or support from government or non-government services, while two in five (43.2%) sought help or support from informal sources. Half (49.5%) of these women had not sought help from any source over the last three months.

The different patterns of help-seeking described in Figure 5 are explained in part by variations in the patterns and likely impact of violence and abuse experienced by women in the three groups. Closer analysis of the three groups revealed that women who experienced both physical or sexual violence and coercive control reported more frequent and severe forms of physical and non-physical abuse. For example, 50.7 percent of women who reported both physical or sexual violence and coercive control said that their partner had attempted to strangle or choke them in the three months prior to the survey, compared with 11.4 percent of women who reported physical or sexual violence but not coercive control. Further, one in three women (31.3%) who experienced both physical or sexual violence and coercive control reported 10 or more emotionally abusive, harassing and controlling behaviours in the last three months, compared with 3.9 percent of women who experienced coercive control but not physical or sexual violence.

Figure 5: Help-seeking among respondents who experienced domestic violence, by type of violence experienced in the last three months (weighted data) (%) (n=1,021)



Note: Limited to women who were in a cohabiting relationship and reported that they had experienced domestic violence in the three months prior to the survey. Respondents could report experiencing both physical/sexual violence and coercive control

a: Total includes 8 women who experienced physical or sexual violence and coercive control, 3 women who experienced physical or sexual violence in isolation and 5 women who experienced coercive control in isolation who were unsure whether they had sought advice or support from police in the three months prior to the survey

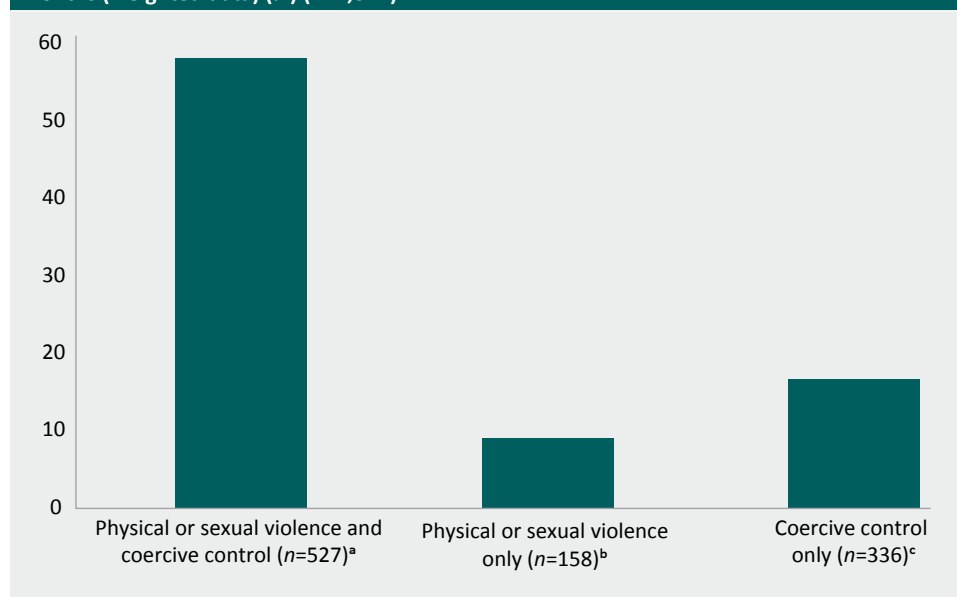
b: Total includes 12 women who experienced physical or sexual violence and coercive control, 3 women who experienced physical or sexual violence in isolation and 4 women who experienced coercive control in isolation who were unsure whether they had sought advice or support from government or non-government support services in the three months prior to the survey

c: Total includes 18 women who experienced physical or sexual violence and coercive control, 4 women who experienced physical or sexual violence in isolation and 8 women who experienced coercive control in isolation who were unsure whether they had sought advice or support from informal sources in the three months prior to the survey. Informal sources of support include friends, family members, spiritual leaders, work colleagues, employers etc

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Overall, more than a third of women (36.9%) who experienced either physical or sexual violence or coercive control said that, on at least one occasion, they wanted to seek advice or support but could not because of safety concerns. Importantly, over half (58.1%) of those women who experienced both physical or sexual violence and coercive control from a current or former cohabiting partner in the three months prior to the survey said that on at least one occasion they did not seek help due to safety concerns. Smaller proportions of women who reported physical or sexual violence but not coercive control (9.0%), or coercive control but not physical violence (16.7%), reported they did not seek help due to safety concerns. This highlights the potential barriers to seeking help that many women experienced during the initial stages of the pandemic—particularly those who experienced more complex and serious violence and abuse (Figure 6).

Figure 6: Women who experienced domestic violence who were unable to seek support on at least occasion due to safety concerns, by type of violence experienced in the last three months (weighted data) (%) (n=1,021)



Note: Limited to women who reported they were in a cohabiting relationship in the past 12 months and had experienced domestic violence in the three months prior to the survey

a: Total includes 37 women who said they were unsure about having experienced barriers to help-seeking in the three months prior to the survey

b: Total includes 6 women who said they were unsure about having experienced barriers to help-seeking in the three months prior to the survey

c: Total includes 21 women who said they were unsure about having experienced barriers to help-seeking in the three months prior to the survey

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Conclusion

This study provides the strongest evidence available about the prevalence of domestic violence experienced by Australian women during the initial stages of the COVID-19 pandemic. One in 20 women (4.6%) experienced physical or sexual violence over the last three months, 5.8 percent experienced coercive control, and one in 10 (11.6%) experienced at least one form of emotionally abusive, harassing or controlling behaviour perpetrated by a current or former cohabiting partner.

Critically, the COVID-19 pandemic appears to have coincided with the onset of physical or sexual violence or coercive control for many women. For other women, it coincided with an increase in the frequency or severity of ongoing violence or abuse. Two-thirds of women who had experienced physical or sexual violence by a current or former cohabiting partner since the start of the COVID-19 pandemic said the violence had started or escalated in the three months prior to the survey. Similarly, more than half the women who experienced coercive control reported the onset or escalation of emotionally abusive, harassing or controlling behaviours during the COVID-19 pandemic.

Although a significant proportion of women did seek help from police, government or non-government agencies and informal sources, many were unable to because of safety concerns. This is consistent with the concerns raised by many in the support services sector that they found it difficult to engage with women during this period of social distancing. It also helps to explain why the number of domestic violence incidents reported to police has not increased (Freeman 2020b).

A cross-sectional survey does not allow cause–effect relationships to be established. Nevertheless, it appears likely that the conditions and consequences associated with the COVID-19 pandemic contributed to an increase in domestic violence. These drivers of increased violence are complex, but likely involve some combination of the increased time spent at home, social isolation due to social distancing requirements and financial stressors associated with the economic impact of COVID-19.

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2. Social isolation, time spent at home, financial stress and domestic violence during the COVID-19 pandemic

Anthony Morgan and Hayley Boxall

A wide range of measures have been introduced to prevent the spread of the novel coronavirus (COVID-19) and reduce the risks to the health of the Australian public. These containment measures have raised concerns about their potential impacts on the safety of victims of domestic violence, particularly women and children (Peterman et al. 2020; Pfitzner, Fitz-Gibbon & True 2020).

While Australian service providers have reported increased demand from victims of domestic violence (Pfitzner, Fitz-Gibbon & True 2020), there has as yet been little evidence of an increase in police recorded violence (Freeman 2020; Kim & Leung 2020). Increases in recorded incidents and calls for police assistance have been observed in several US studies, but not in all cities (Ashby 2020; Leslie & Wilson 2020; Mohler et al. 2020; Piquero et al. 2020), whereas there was a significant decline in the United Kingdom (Halford et al. 2020).

Importantly, police and service provider data are unable to capture the experiences of women who could not seek help. This is especially relevant during the pandemic because of the added barriers to help-seeking for women required to socially distance at home with a violent partner. Surveys conducted in several countries have shown an increase in self-reported domestic violence following the introduction of stay-at-home orders and lockdowns (Arenas-Arroyo, Fernández-Kranz & Nollenberger 2020; Béland et al. 2020; Perez-Vincent et al. 2020). A recent survey of 15,000 Australian women revealed that 8.8 percent of respondents who had been in a cohabiting relationship had experienced actual, attempted or threatened physical or sexual violence by a current or former partner in the three months prior to the survey, conducted in May 2020 (Boxall, Morgan & Brown 2020). Two-thirds of women who reported having experienced physical or sexual violence said either that it was the first time their partner had been violent, or that the violence was getting worse.

Several factors have been identified as possible drivers of an increased risk of violence towards women. The first, and most obvious, is the increased time that women and their partners have been required to spend together at home as a direct consequence of social distancing requirements and the closure of non-essential services, schools and businesses. By late March, and well into April, many Australians had changed their behaviour and were maintaining social distance and avoiding public places (Australian Bureau of Statistics (ABS) 2020a, 2020b).

Situational stressors associated with the pandemic may further exacerbate the risk of domestic and family violence. There is mounting evidence of the financial impact of the pandemic on Australian households. Economic stress has been widely shown to be a risk factor for domestic violence (Pattavina, Socia & Zuber 2015; Smith & Weatherburn 2013), with physical forms of violence concentrated in areas of higher socio-economic disadvantage (Hulme, Morgan & Boxall 2019), and repeat victimisation linked to the presence of offender money problems (Dowling & Morgan 2019). One in three Australian households reported being financially worse off by March (ABS 2020a) and the number of people employed in Australia fell by nearly 600,000 in April alone (ABS 2020c). Financial stress and job insecurity likely placed significant situational stress on many cohabiting couples.

Related to this is the negative psychological impact of social distancing measures, with growing evidence of stress, anger and psychological distress during the pandemic (Shanahan et al. 2020; Van Rheeën et al. 2020). Although this may not, in and of itself, lead to increased violence, there has also been an increase in alcohol consumption (Biddle et al. 2020) which, together with poor mental health, is associated with an increased risk of violence (Elbogen & Johnson 2009). Notably, victim support services have reported an increase in alcohol involvement in domestic violence incidents (Women's Safety NSW & Foundation for Alcohol Research and Education 2020).

Finally, COVID-19 containment measures may further compound social isolation experienced by victims—especially those experiencing coercive control—by limiting their opportunities to seek help from family and friends or from formal support services (Peterman et al. 2020; Pfitzner, Fitz-Gibbon & True 2020). Certainly, Boxall, Morgan and Brown (2020) found evidence that women who had experienced physical or sexual violence, particularly those who were also subjected to coercive control, encountered barriers to help-seeking due to safety concerns.

Aim

Given most of these causal mechanisms are largely speculative in nature, this study aimed to test the following hypotheses about the relationship between the COVID-19 pandemic and the onset of physical and sexual violence experienced by women:

- Hypothesis 1: Women who spend more time at home with their partner, particularly partners with a history of violence towards them, will be more likely to experience violence during the initial stages of the COVID-19 pandemic.
- Hypothesis 2: Women who experience a greater level of social isolation as a consequence of the social distancing measures introduced to prevent the spread of COVID-19 will be more likely to experience physical violence by a cohabiting partner.
- Hypothesis 3: The level of financial stress experienced by households will have increased during the pandemic, and women in households with a high degree of financial stress will be more likely to experience violence.

We explore these hypotheses as they relate to two separate cohorts of women in current cohabiting relationships: those who had experienced physical or sexual violence by their partner before February 2020, and those who had not experienced prior violence.

Method

Sample

This study was conducted using data from an online survey of 15,000 women aged 18 years and over which examined the impact of the COVID-19 pandemic on experiences of domestic violence. The survey, conducted in May 2020, asked respondents about their experience of domestic violence in the three months since February 2020, when COVID-19 first started impacting Australia.

The survey was sent to female members of an online research panel aged 18 years or over. Proportional quota sampling, a non-probability sampling method, was used. In this study we used unweighted data, given our primary interest is in the relationship between variables. The overall completion rate for the survey was 13.7 percent, which compares favourably to online panels for family and domestic violence (eg Miller et al. 2016). Further information on the survey methodology and sampling strategy is provided in the technical appendix to Boxall, Morgan and Brown's (2020) Statistical Bulletin.

For the purpose of the current study, we limited the sample to women who had been in a relationship in the 12 months prior to the survey, and excluded a small number of respondents ($n=47$, 0.3%) with missing, inconsistent or implausible responses to demographic questions. We then limited the sample further to women in a current cohabiting relationship ($n=7,514$, 81% of women who had been in a relationship at some stage in the 12 months prior to the survey). Women who were not in a current cohabiting relationship were excluded because the amount of the time spent at home with their partner in the three months prior to the survey could not be reliably estimated.

To understand the specific impact of the pandemic on domestic violence, we separated those women who had not experienced physical or sexual violence by their intimate partner prior to February ($n=6,925$, 92% of women in current cohabiting relationships) from those who had ($n=521$, 7% of women in current cohabiting relationships). Women who were unsure whether they had experienced violence prior to February 2020 ($n=68$, 1%) were not included in the current study.

Dependent variable

The dependent variable in this study was whether the respondent had experienced physical or sexual violence by an intimate partner in the three months prior to the survey. This captures the period during which COVID-19 first posed a threat in Australia, and during which the major containment measures were introduced.

Physical violence was defined as the occurrence, attempt or face-to-face threat of physical assault by an intimate partner. Respondents were asked about a range of behaviours, including whether their partner had:

- choked, strangled or grabbed them around the neck;
- hit them with something that could hurt them, beat them, stabbed them with a knife or shot them with a gun;
- thrown anything at them that could hurt them, slapped, bit, kicked or hit them with a fist;
- pushed, grabbed or shoved them; or
- physically assaulted them in any other way.

The questions about physical violence were taken from the Personal Safety Survey (ABS 2017). Respondents were also asked a question from the same source about sexual violence—specifically, whether their partner had forced them, tried to force them or threatened to force them to take part in sexual activity against their will.

Respondents were recorded as having experienced physical or sexual violence in the last three months if they answered yes to at least one of the five physical violence items or the question about sexual violence. Following the questions about physical and sexual violence, respondents were asked whether their partner had ever been physically or sexually violent towards them before February 2020.

Independent variables

Sociodemographic characteristics

Respondents were asked to provide basic demographic information including age, Indigenous status, whether they spoke a language other than English most often at home, their highest education level, whether they were pregnant, presence of long-term health conditions (and whether they impacted everyday activities) and the number of children living at home.

Prior experience of emotionally abusive, harassing and controlling behaviour

Consistent with the question about prior physical or sexual violence, respondents were also asked whether their partner had ever engaged in any emotionally abusive, harassing or controlling behaviour (see Boxall, Morgan & Brown 2020 for a definition) towards them prior to February 2020.

Time spent at home with their partner

Respondents were asked to report how many days per week, on average, they spent the entire day at home with their partner in the three months prior to the survey. They were also asked to report how many days per week, on average, they spent at home with their partner prior to February 2020. These responses were used to determine whether the amount of time spent with their partner had increased, decreased or stayed the same.

Social isolation

Respondents were asked about the amount of contact they had in the three months prior to the survey with friends or family they did not live with. Contact could mean communicating in person, on the phone, by email, or online via messenger apps or social media. Responses were categorised using a five-point scale ranging from no contact at all to contact more than once a week.

Financial stress

Respondents were asked to rate the level of financial stress they had experienced in the three months prior to the survey on a scale from 1 to 5 (where 1=none and 5=extreme). They were also asked to rate their level of financial stress prior to February 2020. These were compared to determine whether financial stress had increased during the pandemic. In addition to the question about financial stress, they were asked whether they or their partner had lost their job or had taken a pay cut in the three months prior to the survey.

Analysis

The analysis was undertaken in two stages. First, the relationship between explanatory variables and self-reported physical or sexual violence in the three months prior to the survey was examined using chi-square tests of independence or Fisher's exact test. For variables with more than two categories, standardised adjusted residuals were analysed to determine which of the observed frequencies differed from the expected frequencies.

The second stage of the analysis used a multivariate logistic regression model to measure the independent effect of the major variables of interest on the likelihood of having experienced violence, while controlling for the effect of other risk factors for violence. Model fit was assessed using the Hosmer–Lemeshow goodness of fit test, Cragg–Uhler (Nagelkerke) R^2 and the area under the receiver operating characteristic curve (AUROC). Multicollinearity was also examined.

Results from a second model predicting the onset of physical violence among women who had not experienced prior violence by their current cohabiting partner before February 2020 were confirmed using rare events logistic regression (King & Zeng 2001). This is appropriate when, as a general rule, the probability of the outcome variable is lower than five percent. The coefficients produced by the standard logistic regression and rare events logistic regression were compared. Given there were no substantive differences between the two models, results from the standard multivariate logistic regression are reported, since this allows for predictive margins to be estimated.

Limitations

The survey was limited to women who had access to the internet and were registered as part of the online panel. Non-probability sampling means that, although the sample was large and there was a high concordance with several population-level demographic characteristics, not everyone had an equal likelihood of being selected to participate in the research, meaning results are not necessarily generalisable to the wider female population. Further, the accuracy of the results is limited by women's willingness to report violence, even anonymously, while some may have been unable to participate due to safety concerns. It is also difficult to accurately capture the complex forms of violence and abuse experienced by victims of domestic violence in a short survey with simple yes/no responses.

There are additional limitations to the current study that should also be acknowledged. First, as this study is based on cross-sectional data, a causal relationship between the main variables of interest—time at home, social isolation and financial stress—and physical or sexual violence cannot be established. Second, because of time constraints, only a limited number of questions could be asked as part of the survey. While questions about the nature of violence experienced by women were drawn from established surveys, questions about financial stress, social isolation and time spent with a partner were based on a smaller number of questions. The responses may not capture the nuance of women's experiences with respect to these risk factors for violence. Third, and relatedly, there may be unmeasured confounding factors that are relevant to women's experiences of violence, such as alcohol use and psychological distress.

Results

Nearly three percent ($n=200$, 2.9%) of women in a current cohabiting relationship who had not experienced violence by their current partner before February 2020 (no prior violence, NPV) reported having experienced physical or sexual violence by their partner for the first time in the three months prior to the survey. Two-thirds of women ($n=349$, 67.0%) who had experienced prior violence (PV) said they had experienced a further (repeat) act of physical or sexual violence.

Bivariate analysis

The first stage of the analysis examined the bivariate relationships between respondents' experience of physical or sexual violence in the three months prior to the survey and the following variables: demographic characteristics; prior experience of emotionally abusive, harassing and controlling behaviour; time spent with their partner at home; social isolation; and measures of financial stress (Table 1). Among the main variables of interest, less frequent social interaction with friends or family was associated with a higher prevalence of self-reported violence (PV: $\chi^2(2)=43.4$, $p<0.001$, $\phi_c=0.29$; NPV: $\chi^2(2)=30.4$, $p<0.001$, $\phi_c=0.07$). There was a statistically significant association between a change in the number of days spent at home with a partner and experience of physical or sexual violence (PV: $\chi^2(2)=17.0$, $p<0.001$, $\phi_c=0.18$; NPV: $\chi^2(2)=25.6$, $p<0.001$, $\phi_c=0.06$); however, women who reported spending less time at home were more likely to experience violence.

Finally, there were statistically significant associations between the three measures of financial stress—self-reported financial stress prior to the pandemic, whether financial stress had increased and whether the respondent or their partner had lost their job or taken a pay cut—and the experience of physical or sexual violence during the pandemic. More specifically, higher levels of financial stress prior to February 2020 were associated with a higher prevalence of violence (PV: $\chi^2(4)=92.0$, $p<0.001$, $\phi_c=0.42$; NPV: $\chi^2(4)=141.4$, $p<0.001$, $\phi_c=0.14$). An increase in financial stress was associated with lower rates of violence among women in abusive relationships ($\chi^2(1)=4.4$, $p<0.05$, $\phi=-0.09$), but a higher prevalence of violence among women with no prior violence ($\chi^2(1)=14.1$, $p<0.001$, $\phi=0.05$). Women who reported they or their partner had lost their job or taken a pay cut were more likely to report having experienced violence (PV: $\chi^2(1)=36.1$, $p<0.001$, $\phi=0.26$; NPV: $\chi^2(1)=22.3$, $p<0.001$, $\phi=0.06$).

Table 1: Bivariate relationships between explanatory variables and experience of physical or sexual violence by a current cohabiting partner in the last three months

		Prior violence (n=521)			No prior violence (n=6,925)		
		n	Violence (%)	χ^2	n	Violence (%)	χ^{2a}
Age group	18–24	93	85.0	85.3***	435	9.7	158.0***
	25–34	151	80.1		1,309	5.7	
	35–44	108	70.4		1,458	3.2	
	45–54	85	57.7		1,344	1.6	
	55+	84	28.6		2,379	0.6	
Highest level of education	Up to Year 11 (or equivalent)	67	53.7	9.4*	932	2.4	9.3*
	Year 12 (or equivalent)	48	72.9		954	1.8	
	Vocational qualification	153	63.4		1,944	2.7	
	University	253	71.5		3,095	3.5	
Usual place of residence	Major city	413	69.7	6.8**	5,174	3.2	7.5**
	Regional or remote	108	56.5		1,751	1.9	
Aboriginal or Torres Strait Islander	Yes	129	95.4	62.4***b	157	14.7	***b
	No	387	57.6		6,734	2.6	
	Did not say	5	60.0		34	14.7	
Non-English speaking at home	Yes	185	85.4	44.0***	1,101	5.5	30.6***
	No	336	56.9		5,824	2.4	
Restrictive long-term health condition	Yes	194	85.1	45.6***	637	6.0	23.7***
	No	327	56.3		6,288	2.6	

Table 1: Bivariate relationships between explanatory variables and experience of physical or sexual violence by a current cohabiting partner in the last three months (cont.)

		Prior violence (n=521)			No prior violence (n=6,925)		
		n	Violence (%)	χ^2	n	Violence (%)	χ^{2a}
Currently pregnant	Yes	113	94.7	50.1***	131	9.9	***
	No	408	59.3 ^c		6,794	2.7 ^d	
Number of children living at home	None	217	56.7	17.9***	4,049	2.5	8.2*
	1–2	258	74.4		2,424	3.7	
	3+	46	73.9		452	2.7	
Prior emotionally abusive, harassing and controlling behaviour	Yes	439	71.8	29.1***	553	13.6	300.7***
	No	63	39.7		6,210	1.7	
	Unsure	19	47.4		162	11.7	
Frequency of social interaction with friends or family with whom they do not live (last three months)	More than weekly	211	53.1	43.4***	3,834	2.0	30.4***
	Weekly	78	60.3		1,334	3.4	
	Less than weekly	232	81.9		1,757	4.6	
Average number of days per week spent at home with partner	Increased	246	61.0	17.0***	3,597	2.8	25.6***
	Decreased	83	85.5		471	6.6	
	Stayed the same	192	66.7		2,857	2.4	
Financial stress prior to Feb 2009	None	83	33.7	92.0***	2,764	1.1	141.4***
	Low	98	54.1		1,995	2.8	
	Moderate	107	63.6		1,481	3.4	
	High	142	80.3		528	9.3	
	Extreme	91	94.5		157	10.2	
Increase in financial stress in last three months	Yes	171	60.8	4.4*	2,392	3.9	14.1***
	No	350	70.0		4,533	2.3	

Table 1: Bivariate relationships between explanatory variables and experience of physical or sexual violence by a current cohabiting partner in the last three months (cont.)

		Prior violence (n=521)			No prior violence (n=6,925)		
		n	Violence (%)	χ^2	n	Violence (%)	χ^{2a}
Respondent or partner lost their job or took a pay cut	Yes	288	78.1	36.1***	1,953	4.4	22.3***
	No	233	53.2		4,972	2.3	

***statistically significant at $p<0.001$, **statistically significant at $p<0.01$, *statistically significant at $p<0.05$

a: Where chi-square statistic not reported, Fisher's exact test was used due to small cell counts

b: Chi-square and Fisher's exact tests exclude women who did not disclose whether they were from an Aboriginal or Torres Strait Islander background

c: Includes women who were not sure if they were pregnant (n=8)

d: Includes women who were not sure if they were pregnant (n=50)

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Multivariate logistic regression

We then used multivariate logistic regression to determine the independent effect of each of these variables on the likelihood of a woman having experienced physical or sexual violence in the three months prior to the survey, controlling for other factors. The final models for women who had experienced prior violence (Model 1) and women who had not experienced prior violence (Model 2) are described in Table 2.

Women who had experienced violence prior to the pandemic

For women who had experienced past violence, the odds of experiencing violence in the three months prior to the survey were much lower for respondents aged 55 and over (AOR=0.25), compared with respondents aged 25 to 34 (the reference group). Aboriginal and Torres Strait Islander women were significantly more likely to have experienced violence during the pandemic (adjusted odds ratio (AOR)=5.46), as were women who had previously experienced emotionally abusive, harassing or controlling behaviour (AOR=3.44).

Women who reported having less than weekly contact with family and friends outside of their household during the pandemic were significantly more likely to experience violence than women who had contact with family and friends more than once a week (AOR=3.52). Further, higher levels of financial stress were associated with a higher likelihood of violence, particularly among women reporting extreme levels of financial stress (AOR=10.30); however, there was no effect associated with increased financial stress or the loss of a job or paid hours.

Women who reported a decrease in the amount of time spent at home with their partner were more likely to experience violence (AOR=2.58), controlling for other factors. Further analysis of responses revealed that 70.4 percent of women who had experienced violence and decreased the amount of time spent with their partner said that police had been notified following the most recent incident. It is possible that the time spent at home decreased in response to the violence, either because of criminal justice intervention or because the respondent had taken steps to reduce contact with their violent partner.

Women who had not experienced violence prior to the pandemic

For women who had not experienced violence prior to the pandemic, the results were slightly different. Women aged 18 to 24 were more likely than women aged 25 to 34 to have experienced physical or sexual violence (for the first time) during the pandemic (AOR=1.68), while women aged 35 to 44 (AOR=0.61), 45 to 54 (AOR=0.32) and women 55 years and over (AOR=0.16) were less likely to have experienced violence than the reference category. Women who completed Year 12 or equivalent were less likely than those who had completed Year 11 or below to experience violence (AOR=0.44), but there was no difference among women with higher levels of education. Women living in regional or remote areas were less likely than women in major cities to experience violence (AOR=0.65), controlling for other factors, while Aboriginal and Torres Strait Islander women (AOR=2.40) and women with long-term health conditions that impacted their everyday activities were more likely to experience violence (AOR=1.78). There was a strong association between experience of prior emotionally abusive, harassing and controlling behaviour and the onset of violence during the pandemic (AOR=6.89).

In terms of the main variables of interest, several key findings emerged. There was a strong, significant relationship between financial stress prior to the pandemic and the onset of violence. Relative to women who reported no financial stress, women who reported low (AOR=1.70), moderate (AOR=1.85), high (AOR=4.58) and extreme levels (AOR=4.45) of financial stress were more likely to experience violence. In addition, women who reported an increase in financial stress during the pandemic were significantly more likely to experience first-time violence (AOR=2.02). In contrast, the likelihood of violence was the same for women who said they or their partner had lost their job or paid hours and for those who said they had not. The frequency of social interaction with family and friends was also a significant predictor of the onset of violence during the pandemic, with women reporting weekly (AOR=1.55) or less than weekly (AOR=1.46) contact with family or friends outside of the home more likely to experience violence. However, there was no evidence of a relationship between changes in the amount of time spent at home with a partner and the onset of violence.

Table 2: Logistic regression model predicting experience of physical or sexual violence by a current cohabiting partner in the three months prior to the survey

		Model 1: Prior violence (n=516) ^a		Model 2: No prior violence (n=6,925) ^b	
		AOR	95% CI	AOR	95% CI
Age group (vs 25–34)	18–24	1.35	0.60–3.04	1.67*	1.07–2.63
	35–44	0.62	0.30–1.30	0.61*	0.39–0.92
	45–54	0.56	0.27–1.16	0.32***	0.19–0.54
	55+	0.25**	0.12–0.56	0.16***	0.09–0.30
Highest level of education (vs Up to Year 11 or equivalent)	Year 12 or equivalent	1.97	0.64–6.10	0.44*	0.21–0.92
	Vocational qualification	1.63	0.72–3.70	0.72	0.40–1.30
	University	1.45	0.64–3.29	0.76	0.44–1.34
Usual place of residence (vs Major city)	Regional or remote	0.55	0.29–1.05	0.65*	0.44–0.98

Table 2: Logistic regression model predicting experience of physical or sexual violence by a current cohabiting partner in the three months prior to the survey (cont.)

		Model 1: Prior violence (n=521) ^a		Model 2: No prior violence (n=6,925) ^b	
		AOR	95% CI	AOR	95% CI
Aboriginal or Torres Strait Islander (vs No)	Yes	5.46**	1.74–17.13	2.40**	1.31–4.36
	Rather not say	–	–	6.70**	2.13–21.02
Non-English speaking background (vs No)	Yes	1.17	0.59–2.30	1.21	0.84–1.73
Restrictive long-term health condition (vs No)	Yes	1.39	0.74–2.62	1.78**	1.17–2.69
Currently pregnant (vs No)	Yes	1.96	0.73–5.27	1.62	0.82–3.02
Number of children living at home (vs None)	1–2	0.93	0.52–1.65	1.07	0.76–1.50
	3+	0.63	0.24–1.67	1.62	0.87–3.02
Prior emotionally abusive, harassing and controlling behaviour (vs No)	Yes	3.44**	1.58–7.48	6.89***	4.86–9.76
	Unsure	1.64	0.50–5.37	5.77***	3.18–10.45
Frequency of social interaction with family and friends (vs More than weekly)	Less than weekly	3.52***	2.00–6.19	1.46*	1.03–2.06
	Weekly	1.74	0.89–3.41	1.55*	1.03–2.32
Average number of days per week spent at home with partner (vs Remained the same)	Increased	0.90	0.52–1.57	1.07	0.76–1.52
	Decreased	2.58*	1.11–6.01	1.28	0.77–2.13

Table 2: Logistic regression model predicting experience of physical or sexual violence by a current cohabiting partner in the three months prior to the survey (cont.)

		Model 1: Prior violence (n=521) ^a		Model 2: No prior violence (n=6,925) ^b	
		AOR	95% CI	AOR	95% CI
Financial stress prior to February 2020 (vs None)	Low	2.67*	1.27–5.63	1.70*	1.06–2.73
	Moderate	1.78	0.82–3.85	1.85*	1.13–3.03
	High	2.36*	1.04–5.32	4.58***	2.63–8.00
	Extreme	10.30***	3.12–33.99	4.45***	2.11–9.39
Increase in financial stress in last three months (vs No)	Yes	0.96	0.53–1.75	2.02***	1.39–2.92
Respondent or partner lost their job or took a pay cut (vs No)	Yes	0.99	0.56–1.75	1.07	0.76–1.51
	Constant	0.14**	0.04–0.52	0.01***	0.01–0.03

***statistically significant at $p < 0.001$, **statistically significant at $p < 0.01$, *statistically significant at $p < 0.05$

a: Likelihood–ratio test $\chi^2(26)=172.92$, $p < 0.001$; Hosmer–Lemeshow $\chi^2(8)=7.94$, $p=0.44$; AUROC=0.869; Nagelkerke $R^2=0.491$; Excludes 5 women who did not disclose whether they were from an Aboriginal or Torres Strait Islander background

b: Likelihood–ratio test $\chi^2(27)=402.62$, $p < 0.001$; Hosmer–Lemeshow $\chi^2(8)=7.86$, $p=0.45$; AUROC=0.862; Nagelkerke $R^2=0.264$

Note: Model was specified with robust standard errors. AOR=adjusted odds ratio, CI=confidence interval

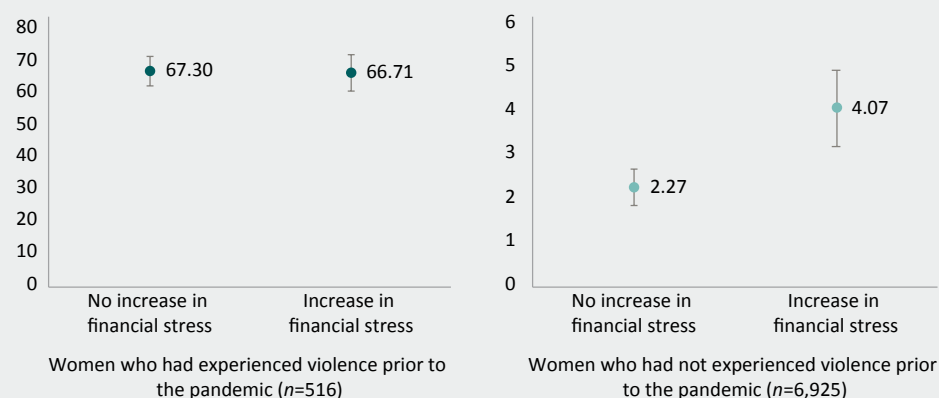
Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Predicted probability of physical or sexual violence

We then estimated the average predictive margins, adjusted for covariates using marginal standardisation (Muller & MacLehose 2014), for financial stress and social isolation. Predictive margins indicate the average predicted probability of the outcome of interest being observed—in this case, the experience of physical or sexual violence in the three months prior to the survey—when a certain characteristic is present, controlling for the other variables in the logistic regression models in Table 2. We also calculated the average marginal effect (AME), which is the average change in probability.

The predicted probability of first-time violence was 1.8 times higher for women who reported an increase in financial stress during the pandemic (4.1%) than for women who did not report an increase in financial stress (2.3%; AME=1.8pp, $z=3.44$, $p < 0.01$; see Figure 1). Critically, one in three women (34.5%) who had not experienced violence by their partner prior to the pandemic reported an increase in financial stress after February 2020. Women who had previously experienced violence were just as likely to report an increase in financial stress (32.8%); however, there was no difference in the probability of physical or sexual violence between those respondents who did (66.7%) and did not (67.3%) report an increase in financial stress ($z=-0.14$, $p=0.888$). It is worth noting that women who had experienced violence before February 2020 were significantly more likely than other women to report high or extreme levels of financial stress before the start of the pandemic ($\chi^2(4)=633.9$, $p < 0.001$, $\phi_c=0.29$).

Figure 1: Predicted probability of physical or sexual violence in the three months prior to the survey, by change in financial stress (%)

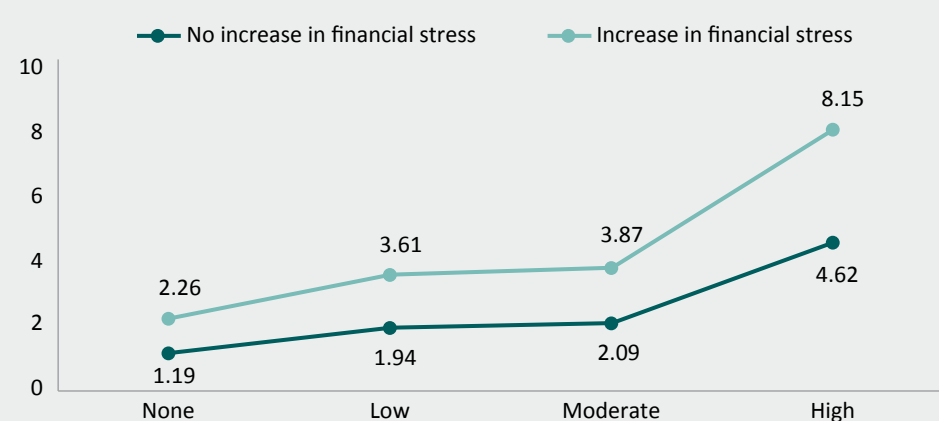


Note: Predictive margins based on logistic regression model reported in Table 2

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

We then estimated the predicted probability of first-time physical or sexual violence for women who did and did not report an increase in financial stress, based on their level of financial stress prior to the pandemic (Figure 2). The probability of first-time violence among women who were experiencing a high level of financial stress before the pandemic, and who reported an increase in financial stress, was 8.2 percent, compared with 4.6 percent for women who did not report an increase in financial stress (AME=3.5pp, $z=2.8$, $p<0.01$). By comparison, the probability of first-time violence among women who were not financially stressed before the pandemic, but who reported an increase in financial stress, was 2.3 percent—1.1 percentage points higher than women who did not report an increase in financial stress (1.2%; $z=3.2$, $p<0.01$).

Figure 2: Predicted probability of first-time physical or sexual violence in the three months prior to the survey, by level of financial stress prior to pandemic (%)

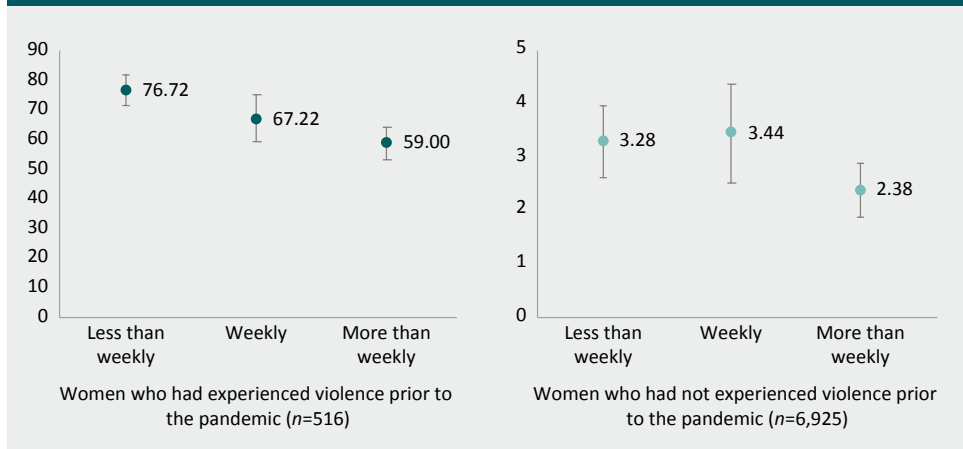


Note: Limited to women who had not experienced violence prior to the pandemic. Women who reported extreme financial stress prior to the pandemic could not report an increase in financial stress and are not included

Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Finally, we estimated the predicted probability of physical or sexual violence among women with and without prior experience of violence according to their frequency of social interaction with family or friends (Figure 3). Among women who had experienced violence prior to the pandemic, the probability of physical or sexual violence was 17.7 percentage points (1.3 times) higher for women with less than weekly contact than for women who maintained more than weekly contact with friends and family (76.7% vs 59.0%; $z=4.49$, $p<0.001$). The difference between women with less than weekly contact and women with weekly contact was also significant (AME=9.5pp; $z=1.98$, $p<0.05$). Among women who had not experienced violence prior to the pandemic, the probability of first-time violence was 1.4 times higher for women with less than weekly contact (AME=0.9pp; $z=2.1$, $p<0.05$) and for women with weekly contact (AME=1.1pp; $z=2.0$, $p<0.05$) than for women who maintained more than weekly contact with family and friends.

Figure 3: Predicted probability of physical or sexual violence in the three months prior to the survey, by frequency of social interaction (%)



Source: Impact of COVID-19 on domestic violence survey, AIC [computer file]

Discussion

In this study we examined the impact of the COVID-19 pandemic on the likelihood of self-reported partner violence among Australian women in current cohabiting relationships, using data from a large online survey. The specific impacts of increased time spent at home, social isolation and financial stress on rates of physical and sexual violence during the COVID-19 pandemic were examined. The majority of women had not experienced violence by their partner prior to the pandemic. Among those who had, two-thirds experienced further violence. Three percent of women experienced the onset of violence during the pandemic.

We did not find any evidence that an increase in the amount of time spent at home directly influenced the likelihood of either repeat or first-time violence. However, women who had less frequent contact with family and friends outside of the household during the pandemic were more likely to experience both repeat and first-time violence. The probability of violence was between 1.3 and 1.4 times higher among women who had less frequent contact with non-household members. We were unable to measure changes in the frequency of contact, but there is compelling data showing the social distancing requirements introduced to reduce community transmission of COVID-19 significantly impeded social interaction with non-household members (ABS 2020b).

Women in households with higher levels of financial stress before the pandemic were more likely to experience physical or sexual violence, irrespective of whether they had experienced violence by their partner before February 2020. While the level of financial stress leading into the pandemic was a strong predictor of violence for both groups, the probability of first-time violence was 1.8 times higher among women who experienced an increase in financial stress. This indicates the financial impact of the pandemic has affected women's safety. Of course, financial stress does not exist in a vacuum, and there is a complex interplay with other factors—not all women who reported an increase in financial stress experienced violence—but we suggest it presents a significant situational stressor that impacted on women's safety during the pandemic.

Although they were not the focus of the current study, we identified several other factors associated with an elevated risk of violence during the pandemic. Women who have restrictive long-term health conditions were more likely to experience the onset of violence during the pandemic, while Aboriginal and Torres Strait Islander women and women who had experienced emotionally abusive, harassing and controlling behaviour prior to February were more likely to experience violence, irrespective of whether they had previously experienced violence. The latter is particularly notable in the context of first-time violence, and highlights the importance of intervening early to prevent the escalation of non-physical to physical forms of violence within a relationship. Conversely, there was some evidence that women living in regional or remote areas were less likely to experience the onset of violence, once other factors were taken in account; however, the onset of violence is only one measure of the impact of the pandemic, and it is possible that they experienced other negative consequences.

Overall, we conclude that the early stages of the COVID-19 pandemic were associated with an increased risk of violence against women in current cohabiting relationships, most likely from a combination of increased economic stress and social isolation. The limitations of our survey need to be acknowledged, particularly as they relate to drawing conclusions about causal relationships using a cross-sectional survey. Nevertheless, we believe the data from this survey make an important contribution to our understanding of the impact of the COVID-19 pandemic on domestic violence, and can help inform targeted efforts to address women's safety. This research contributes to a growing body of international evidence demonstrating the impact of the pandemic on domestic violence and, in particular, the impact of the economic consequences of containment measures (Arenas-Arroyo, Fernández-Kranz & Nollenberger 2020; Béland et al. 2020). More broadly, these findings may have implications for how we understand the onset of domestic and family violence, and the role that situational stressors play in establishing patterns of violence and abuse perpetrated against women.

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3. Availability of COVID-19 related products on Tor darknet markets

Roderic Broadhurst, Matthew Ball and Chuxuan Jessie Jiang

Introduction

Since the World Health Organization declared the novel coronavirus (COVID-19) outbreak to be a public health emergency of international concern (WHO 2020), attention has focused on the capacity of health systems to respond. Significant concerns have been raised about the availability of vital medical supplies and personal protective equipment (PPE; Woodley 2020). As the pandemic sparks significant demand, shortages are being reported worldwide (Jacobs, Richtel & Baker 2020) and profit-motivated criminal groups and entities are seizing the opportunity to exploit gaps in the healthcare sector (Europol 2020; Global Initiative Against Transnational Organized Crime 2020).

Tor darknet markets are frequently used as a litmus test of illicit drug and malware trends, as well as criminal novelty and entrepreneurship more generally. Surveys of darknet markets help track prices of narcotics and other drugs as well as surges or shortages in certain drugs or contraband. Crime follows opportunity and the COVID-19 pandemic offers profiteering arising from shortages and fear.

The Australian Institute of Criminology's Serious and Organised Crime Research Laboratory commissioned the Australian National University's Cybercrime Observatory to scan active darknet cryptomarkets on Tor for COVID-19 related products. A scan of 20 darknet markets was undertaken on 3 April 2020 (and verified on 6 April) to identify the scale and scope of 'underground' online sales of COVID-19 related products. Identified products included vaccines, antiviral or repurposed medicines for COVID-19 treatment, diagnostic tests and PPE such as surgical or N95 masks (see Figure 1). The available products were most likely diverted or stolen from factories, stores and warehouses or laboratories producing PPE or pharmaceuticals.

Figure 1: Screenshot of COVID-19 related products listed on Agartha

Product	Price (AS)	Seller	Shipping
Buy Hydroxychloroquine for coronavirus-COVID19	AS 328.77 (0.031469 BTC)	williamsharry464	From: United States, To: Worldwide
CORONA MEDICAL FACE MASK \$500	AS 821.92 (0.078671 BTC)	LEGIT4SURE	From: United States, To: Worldwide
COVID-19 PROTECTION MASKS AND SANITIZERS	AS 246.58 (0.023601 BTC)	spidergroup	From: United States, To: Worldwide
CORONAVIRUS VACCINE FOR FAST SHIPPING FULL ESCROW	AS 493.15 (0.047203 BTC)	Rodrigomendez	From: United States, To: Worldwide
COVID-19 PROTECTION MASKS AND SANITIZERS	AS 2.34 (0.000224 BTC)	spidergroup	From: United States, To: Worldwide
COVID-19 PROTECTION MASKS AND SANITIZERS	AS 2.34 (0.000224 BTC)	spidergroup	From: United States, To: Worldwide

Method

The Tor darknet market environment is highly volatile and prone to disruption. We sought to capture the relevant data by selecting and searching available darknet markets in a single day. Crawlers designed for Tor sites were used to search known markets for the COVID-19 related products of interest. For further details of the search methods, see Ball et al. 2019.

Altogether, 20 omnibus darknet markets were identified as active on Friday 3 April 2020 and surveyed for COVID-19 related products. This represented a substantial, if unknown, proportion of active omnibus darknet markets in the Tor hidden service ecosystem. Niche markets were excluded. The authenticity of the markets included in this snapshot could not be fully ascertained. Many are prone to vendor swindles and market exit scams. Only 16 markets are listed and ‘vetted’ as genuine on the well-known Tor information clearing house Darknetlive (see <https://darknetlive.com/markets/>) but only nine out of the 20 markets included here met Darknetlive’s criteria. At the time of survey, 12 of the 20 markets (60%) returned at least one COVID-19 related product listing. These 12 darknet markets are listed below, with an asterisk (*) indicating markets ‘approved’ by Darknetlive:

- Agartha
- Apollon (Another Tor clearing house, ‘The Hub’, stated that Apollon closed in an exit scam on 28 January 2020. Given the absence of product movement, this is likely. Only azithromycin was detected on Apollon.)
- Avior
- Cypher*
- DarkBay*
- DarkMarket*
- Dream Alt
- Empire*
- Square*
- Versus*
- White House*
- Yellow Brick*

The other eight markets (AlphaOmega, ASEAN, BlackRy, DarkFox, Europa, Monopoly*, Pax Romana and Venus Anonymous) returned no results for COVID-19 related product listings. Automated crawlers were not used to collect data from seven of these eight markets because they did not meet our threshold minimum of at least 1,000 listings per market. However, they were manually surveyed for this census or snapshot.

We searched each market for terms such as ‘COVID-19’, ‘coronavirus’, ‘virus’, and ‘pandemic’, and then inspected the listings identified. We then excluded listings where these terms were used as promotional devices for other products, notably drugs—for example: ‘Special—COVID-19 offer on MDMA’, ‘Coronavirus special price’ and ‘Free masks with every delivery of Oxcy’. We noted that some malware and ransomware vendors promoted COVID-19 related social engineering scripts and these were also excluded from analysis. We also searched for specific terms relating to antiviral and other medicines (eg favipiravir, azithromycin and chloroquine, as well as their proprietary brand names) and PPE (eg N95). Three days after the first survey, market listings were verified and a decline in listings on Agartha was observed. The listing title, price, vendor, market, shipping from location, and shipping to location were recorded for each listing identified.

We also reviewed six popular darknet forums or information centres for qualitative sources of information about the response of darknet markets and consumers to the pandemic. These information hubs were two 'clearnet' forums (dark.fail and Darknetlive) and four hidden Tor services (Dread, The Hub Forum, Envoy Forum and DNM Avengers Forum).

The total number of listings includes all products that were located on the 12 markets, including duplicated listings posted by the same vendor under different sub-categories (ie in drugs, services and drug paraphernalia) or in different markets. The number of unique listings excludes those product listings repeated within or across markets. We undertook no purchases and the veracity of products on offer could not be verified. Information on purchases was not available. Darknet markets are prone to scams and fake or substitute product deliveries are commonplace. COVID-19 related products are unlikely to be exempt.

Results

Table 1 summarises the types of products available and their approximate prices. A total of 645 COVID-19 related products were found, one-third of which ($n=222$) were unique listings identified after the removal of listings repeated across markets.

These COVID-19 related products made up less than one percent of all products available, which included thousands of listings across all markets for various drugs, services and digital products. There are fewer COVID-19 related products on darknet markets than products such as fentanyl (Ball, Broadhurst & Trivedi 2020) or firearms and other weapons (Broadhurst et al. forthcoming). Agartha listed 444 COVID-19 related products (0.3% of its 159,463 listings) while DarkBay's 118 COVID-19 related listings represent only 0.2 percent of its total of 63,596 listings.

Table 1: Summary of COVID-19 related products available on 12 Tor darknet markets

Products	All listings <i>n</i> (%)	Unique listings <i>n</i> (%)	Median price (A\$)	Mean price (A\$) ^a
PPE	224 (34.7)	99 (44.6)		
Surgical masks/sanitiser/gloves	118 (18.3)	50 (22.5)	100	780 ^b
N95/N99 masks	77 (11.9)	27 (12.2)	400	1,391
Protective suits/full PPE	7 (1.1)	6 (2.7)	1,158	4,939
Bulk masks/sanitiser/gowns	22 (3.4)	16 (7.2)	1,551	3,116
Tests/diagnostics	59(9.2)	19 (8.5)		
Quick/rapid/virus tests	28 (4.3)	12 (5.4)	313	937
Thermo-scanners/industrial	31 (4.8)	7 (3.1)	5,738	6,689
Vaccines/antidotes	41 (6.4)	22 (9.9)	575	5,393
Antiviral/repurposed medicines	313 (48.5)	74 (33.3)		
Hydroxychloroquine	105 (16.3)	11 (5.00)	200	383
Chloroquine	125 (19.4)	35 (15.8)	308	549
Favipiravir	4 (0.6)	4 (1.8)	563	494
Azithromycin	79 (12.3)	24 (10.8)	43	103
Ventilators	1 (0.2)	1 (0.5)	2,000	2,000

Table 1: Summary of COVID-19 related products available on 12 Tor darknet markets

Products	All listings <i>n</i> (%)	Unique listings <i>n</i> (%)	Median price (A\$)	Mean price (A\$) ^a
Other	7 (1.1)	7 (3.2)		
COVID19 Handbook	5 (0.8)	5 (2.3)	15	14
3D printed masks app	2 (0.3)	2 (10.00)	1	1
Total	645 (100)	222 (100)	200	49,165

a: Prices are estimated for unique listings

b: An extreme outlier excluded

Note: Percentages may not total 100 due to rounding

COVID-19 related products and prices

Personal protective equipment

Personal protective equipment such as masks, sanitisers, gowns and gloves accounted for about half of all unique listings ($n=99$, 45%) and over a third of all listings ($n=224$, 35%). Prices and quantities varied significantly. For example, a vendor on DarkBay sold a 'Factory Supply Anti Virus Cotton Reusable N95 1860 Face Mask for Corona Virus' for US\$1 but did not specify quantities. Another vendor on Agartha offered 'CORONA MEDICAL FACE MASK \$500' but did not mention the number of masks.

Seven percent of unique listings of PPE products ($n=16$) offered bulk purchases and two (1%) offered computer applications for the 3D printing of masks. Examples of bulk offers include an Agartha vendor who sold '10,000 GOOD QUALITY LAB TESTED FACE MASK FOR CORONA' valued at A\$17,952, and another vendor on Yellow Brick who offered 'BULK anti corona virus mask ON SALES FAST DELIVERY' for A\$5,000.

Antiviral and repurposed medicines

After PPE, antiviral and repurposed medicines were the next most common products, accounting for a third of the unique listings ($n=74$, 33%) and almost half of all listings ($n=313$, 49%). Antimalarial drugs, the antibiotic azithromycin and the antiviral medicine favipiravir have been featured in media reports about likely treatments for COVID-19.

While antimalarial treatments (eg chloroquine and hydroxychloroquine) are usually cheap and readily available, they were present at inflated prices in notable quantities in over a third ($n=230$, 36%) of all listings and nearly three-quarters of all medicinal listings. A vendor on White House who shipped worldwide offered 'Hydroxychloroquine Hcqs 400mg 100 Pills \$139 Miracle Drug For Coronavirus' and 100 200-milligram pills for \$US90.

The antibiotic azithromycin was also listed 79 times (12% of all listings) and accounted for 11 percent of unique listings ($n=24$). An Agartha vendor shipping from the United States advertised 'Order Azithromycin for Coronavirus - COVID-19' for A\$329.

Four listings of the antiviral medicine favipiravir (also known as T-705 and sold under the brand name Avigan) were identified (2% of unique listings, <1% of all listings). For example, a vendor on Empire offered 'Favipiravir Pills 10 Pills Per Bottle COVID19 CURE' for A\$165 (shipping details not provided), but another vendor shipping from Italy offered 'High Quality Best Price Favipiravir (CAS 259793-9)' for A\$452. A vendor on Agartha who shipped worldwide from Belgium offered a combination of 'Favipiravir, Chloroquine, Lopinavir and Ritonavir' from A\$674. Observed once, lopinavir and ritonavir are HIV/AIDS treatments noted as potentially useful for treating COVID-19.

Vaccines, antidotes and cures

Despite the absence of a vaccine for COVID-19, or any other coronavirus, purported vaccines and antidotes made up about six percent of all listings ($n=41$) and 10 percent of unique listings ($n=22$). The following listing titles are typical of those touting vaccines and cures: 'GET CORONA VIRUS VACCINE OVERNIGHT DELIVERY'; 'HELLO buy fast... CORONA-VIRUS VACCINE is out now'; 'COVID-19 ANTIDOTE IS HERE FROM CHINA'; 'COVID-19 CURE VACCINE. Keep quiet on this'; 'COVID-19 ANTIDOTE VACCINS FOR SALE'; 'BY CORONAVIRUS CURE WE ORDER WORLD WIDE VERY UNDERSTANDABLE PRIZES'; and 'CORONAVIRUS VACCINE FOR FAST SHIPPING FULL ESCROW'.

Details about the origin or composition of vaccines were sparse, but they are likely fraudulent. There may also be experimental vaccines illegally diverted from research laboratories conducting animal or human trials, or even sourced from patients who have recovered from COVID-19.

The median cost of a vaccine was A\$575, but vaccines offered by three vendors on DarkBay allegedly sourced from China were priced at US\$10,000 to US\$15,000. The most costly vaccine was 'COVID-19 Antidote for sale' at A\$24,598 on Dream Alt, shipped worldwide from the United States. Vaccines were available only from Agartha, DarkBay and Dream Alt. Four Agartha vendors offered free worldwide shipping of vaccines ranging in price from A\$657 to A\$739 ('GET THAT VACCINE FOR THE MOST VIRAL CORONA VIRUS'), and one included escrow at \$493 ('CORONAVIRUS VACCINE FOR FAST SHIPPING FULL ESCROW').

Tests

COVID-19 test kits (eg 'New rapid test kit to detect COVID-19') were also listed 28 times, but comprised only eight and a half percent of unique listings ($n=19$). A DarkMarket vendor shipping worldwide from Europe sold a 'COVID-19 Antibody Test Kit' for A\$71. A few listings offered test kits in bulk, such as an Agartha vendor who sold 500 'Corona Virus Test/COVID-19 Test Kits (500Pcs)' for A\$3,287. Industrial scanning thermometers were also available in 31 listings (5% of all listings; $n=7$; 3% of unique listings) including those titled: 'BUY CAMERA SCANNER FOR CORONAVIRUS DETECTION'; 'INFRARED THERMOMETERS, 3PLY MASKS, SURGICAL MASKS'; and 'free shipment COVID19 thermometer scanner'. One Agartha vendor, shipping worldwide from the United States, claimed to be a bulk supplier of 2,000 'Industrial Thermometers COVID-19 (2000Prd/\$4)', on sale for A\$52 each, but another offered all 2,000 'Industrial Thermometers' for A\$13,150. Another Agartha vendor, shipping worldwide from Hong Kong, offered 'BUY CAMERA SCANNER FOR CORONAVIRUS DETECTION' for A\$1,357.

Other

Other COVID-19 related products identified included a single ventilator, priced at \$2,000, and five listings of a book titled '*Corona Virus Covid19 Epidemic Survival Handbook Medical Physical Social Economic and Financial Guide*'. This handbook was the only product related to COVID-19 sold on Cypher.

Markets

Among markets, Agartha ($n=444$) offered over two-thirds (69%) of all available COVID-19 products, followed by DarkBay (18%, $n=118$) and Empire (7%, $n=48$). Each of the other nine markets offered five or fewer products and accounted for the remaining five percent of all product listings. One market, Cypher, offered only a single listing: the '*Corona Virus Covid19 Epidemic Survival Handbook*'. Agartha's market share is much lower when unique listings are considered: Agartha comprised about a third (35%) of unique listings, followed by DarkBay (31%), Empire (19%) and other markets (16%).

Purported vaccines were available on Agartha, DarkBay and Dream Alt, and diagnostic tests and antiviral medicines could also be found on Empire and DarkMarket. These markets were the dominant sources of most products. PPE was sold on four markets, with Agartha selling 50 percent of supply, DarkBay 28 percent, Empire 16 percent and Square six percent.

Agartha was the dominant market in terms of capitalisation, making up 74 percent of the A\$879,000 estimated value, taking into account all listings. However, this value is reduced to A\$369,000 and Agartha's market share to 51 percent if only unique products are valued. Agartha has a reputation for scam risk among some forums but has grown since mid-2019 to over 150,000 listings. We observed a substantial decline in COVID-19 related products on Agartha by 6 April, three days after the 3 April census, indicating sales and/or removal. All other markets remained as observed on census.

Vendors

We identified 110 unique vendor handles. (A Jaro–Winkler Score ≥ 0.90 was used to merge three identical vendors.) Eight vendors were active in at least two markets, including one active across four markets and another across three markets.

Based on all listings, most vendors claimed they were shipping from the United States ($n=394$, 61%), or Europe ($n=56$, 9% including the UK), although over a quarter did not indicate their location ($n=182$, 28%). Some vendors indicated where they shipped products to. Two-thirds of listings ($n=430$, 67%) promised to ship worldwide, while nearly a third shipped only to the United States ($n=187$, 29%). The remainder ($n=24$, 4%) shipped within Europe or the United Kingdom. Four (1%) specifically mentioned shipping to Australia.

Three listings claimed to be shipped from Australia or China/Hong Kong (see Table 2). A vendor on Agartha shipped a 'New rapid test kit to detect COVID-19' to and from Australia for A\$1,643 and also shipped 'Protection from novel coronavirus Disposable medic' worldwide from China, priced at \$8,219. Another vendor claimed to ship worldwide from Australia, offering 'Corona Anti Virus Face Mask Ready and, gowns' priced at A\$57.

Table 2: Vendor shipping locations (based on all listings)

Shipping from	<i>n</i>	%
United States	394	61.1
European Union ^a	39	6.0
United Kingdom	17	2.6
Australia	3	0.5
China/Hong Kong	3	0.5
India	2	0.3
Worldwide	2	0.3
Turkey	1	0.2
Canada	1	0.2
New Zealand	1	0.2
Unknown/not stated	182	28.2
All	645	100.0

a: Sweden (10), Spain (8), Germany (7), Austria (4) Cyprus (1), Italy (2), Belgium (2), France (2), Denmark (2) and Finland (1)

Note: Percentages may not total 100 due to rounding

A relatively small proportion of vendors accounted for most of the listings and potential profit. Among the most active was 'DrugLord22', a vendor with 23 listings on Agartha, including 'industrial thermometers' in bulk, with an estimated total value of A\$302,467. A vendor known as 'Safetrade' sold bulk N95 masks (16 listings worth A\$8,350) and 'kinghacks' sold vaccines and was active on DarkBay and Dream Alt, with eight listings with an estimated total value of A\$99,598.

Darknet forums and information centres

Posts on darknet forums and information centres about how vendors should approach the COVID-19 pandemic are highly visible. Some provide guidance for vendors. For example, dark.fail (<https://dark.fail/>) instructs:

Respect lockdowns. Self-quarantine if you are feeling symptoms. Wash your hands regularly, disinfect packages when interacting with mail.

The same forum tells consumers to read Yale's *Guidance for people who use substances on COVID-19 (Novel coronavirus)*, which educates about harm reduction.

The Darknetlive forum's 'Corona Timeline' (<https://darknetlive.com/corona>) provides information about disruptions to international postal services. Figure 2 presents examples of typical posts about these delays, as posted or reposted by forum members.

Figure 2: Darknet community posts

April 3

Coronavirus: Domestic updates - AusPost

With significant measures being taken across the country to combat the spread of COVID-19, our priority at Australia Post is to protect our people, customers and community.

April 1

Orders delayed until further notice - dutchkingz (Vendor)

We had some trouble shipping out orders placed between 28 March and April 1st. orders placed on and before 28 march 2020 have all been shipped out

March 31

Clarity about Corona | | Small Update regarding no full lockdown in NL - DutchDrugz (Vendor)

So far shipments are arriving, also in lockdown countries, but delays can be insane. Destinations which usually arrive within 5 to 10 days, can now take over 4 to 6 weeks, no joke.

March 26

DCdutchconnectionUK (DCUKConnection) COVID-19 UPDATE (Vendor)

Over the next few weeks we really don't know if we can stay online and ship products, this would depend on the lockdown and if the postal service carries on running.

Discussions about COVID-19 on the darknet from mid-February have mirrored those on the clearnet, with the same surges as found in Google searches (Guirakhoo 2020a). In darknet forum discussions about criminal opportunities in a pandemic, a Digital Shadows analyst also observed (Guirakhoo 2020a):

...some atypical discussions from users including:

- *Discouraging other users from profiting off the pandemic*
- *Expressing solidarity with countries affected (particularly Italy)*
- *Providing health and safety information*

Nevertheless, COVID-19 related opportunities have been identified across the spectrum of cybercrime from malware, phishing, online sales of drugs and contraband, fraud, fakes and deception.

Darknet players are profiteering, and not only are we seeing ‘coronavirus sales’ but on the flip side ‘ethical’ market actors are threatening anyone trying to conduct scams. For example, a user with the handle Ganymedes posted on the Envoy forum: ‘Anyone who runs coronavirus scams I will personally make it my mission to blow their doxx wide open to the entire darknet and the entire LE [law enforcement].’ In a recent post, the darknet market Monopoly banned COVID-19 related products for ethical reasons:

You do not, under any circumstances use COVID-19 as a marketing tool. No magical cures, no silly fucking mask selling, toilet paper selling. None of that bullshit. We have class here... (Haig 2020)

Monopoly also warned buyers:

You are about to ingest drugs from a stranger on the internet - under no circumstances should you trust any vendor that is using COVID-19 as a marketing tool to peddle tangible/ already questionable goods... (Haig 2020)

As yet, discussions related to purported cures or vaccines for COVID-19 have not been found, but this could be due to the strict moderation on these forums. Discussions on ‘The Hub’ cover both harm reduction (especially misinformation) and opportunities for profit.

Conclusion

The availability of COVID-19 related products on darknet markets is relatively insignificant compared to the availability of other contraband. However, the presence of fraudulent or untested vaccines and medicines warrants closer attention. Indeed, the underground sale of vaccines, real or not, is the key risk presented by darknet sales of COVID-19 products and raises two key concerns. First, fake vaccines could worsen the spread of the virus because users may behave as if immune but nevertheless become infected. Second, the premature release of vaccines undergoing animal or human trials would also misguide users as to their immunity, but may also impact on the success of these crucial clinical trials.

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4. Changes in online gambling during the COVID-19 pandemic: April update

Rick Brown and Amelia Hickman

The COVID-19 pandemic has impacted consumer spending behaviours across all sectors of the Australian economy. With nationwide restrictions introduced in response to the pandemic, such as the shutdown of gambling venues (Morrison 2020), consumer participation in gambling has changed. The Alliance for Gambling Reform (2020) reported that \$1.5 billion had been saved from poker machine gambling in pubs and clubs alone as a result of these closures, with the figure increasing to \$2 billion when casino gambling losses were included.

However, the shutdown of physical gambling venues has shifted gambling participation to online platforms. AlphaBeta (2020) reported an increase in online gambling transactions during both March and April 2020, with a 142 percent increase in the week ending 3 May. National Australia Bank reported a 20 percent surge in online gambling spending in March (Harris 2020). A major gambling firm, 888 Holdings (2020), reported an 18 percent increase in average daily revenue between January and March 2020 compared with the same period last year. There was also evidence of an increase in customer activity despite the decline in sports betting caused by the cancellation of professional sports around the world (888 Holdings 2020).

A recent survey conducted by the Australian Institute of Criminology reported that almost a quarter of respondents participated in online gambling in March 2020 (Brown & Hickman 2020). Ten percent of those had increased their participation in at least one form of online gambling since the beginning of the year, while 14 percent had decreased participation. The survey also found that being male, under the age of 30 and in full-time employment were associated with increased online gambling in March (Brown & Hickman 2020).

These findings are concerning in the context of the association between gambling and crime (Lind, Kääriäinen & Kuoppamäki 2015). Gambling has been shown to contribute to both fraud and theft (Sakurai & Smith 2003) and domestic and family violence (Dowling et al. 2018). Increases in online gambling during the shutdown could create additional household stress that leads to involvement in crime.

Drawing on new survey data, this study aims to investigate changes in the prevalence of online gambling in April compared with March 2020.

Method

This research reports on the findings from two surveys. The first was conducted between 3 and 6 April and the second between 4 and 6 May 2020. Each involved a sample of 1,000 adults, broadly representative of the population with regard to gender, age and state/territory. Both surveys were conducted through the i-Omni service provided by the commercial survey company i-Link. The surveys drew on an existing panel of survey participants, who received a reward from i-Link for participation.

The questions asked in each survey were identical, allowing direct comparisons of the two sets of results. As these surveys were drawn from an existing panel of survey participants and were not randomly selected from the general public, the results should not be extrapolated to create wider population estimates. More detailed findings from the first survey can be found in Brown and Hickman (2020).

Results

Changes in the prevalence of online gambling in the last month

Respondents were asked to indicate the last time they had participated in a range of activities through either a mobile app or a website. Among these questions, they were asked whether they had participated in online gambling in the last month. In March 2020, 24 percent ($n=235$) of respondents reported having participated in online gambling. In April 2020, this declined to 20 percent ($n=199$). This difference was statistically significant ($p<0.05$), suggesting that fewer people engaged in online gambling in April.

Changes in the types of online gambling

Table 1 examines the types of online gambling respondents had engaged in during the last month for March and April 2020. It shows the proportion of respondents who had increased or decreased their participation in each type of online gambling in the last month. Similar proportions of respondents in March and April participated more often in at least one form of online gambling.

For three types of online gambling there were statistically significant differences in participation between March and April. In March, 33 percent of online gamblers reported betting less on sporting events in Australia. In April, 22 percent reported betting less often on this activity. The proportion of respondents playing online casino games less often fell from 23 percent in March to 15 percent in April. There was also a reduction in the proportion of respondents betting less often on 'other' forms of gambling, from 26 percent in March to 18 percent in April. These findings indicate more stability among those engaging in online gambling in April, with fewer respondents betting less often, coupled with no change in the proportion of respondents participating more often in particular forms of gambling.

To confirm this general pattern, further analysis examined the proportion of online gamblers who participated less or more in any of the items in Table 1. This revealed a similar trend, with fewer respondents in April than in March participating less in each type of gambling. While 60 percent ($n=142$) of online gamblers reported participating less in any type of gambling in March, this declined to 46 percent ($n=91$) in April. This difference was statistically significant. At the same time, there was no significant change in the proportion of online gamblers who participated more often in any type of gambling in April (42%, $n=84$) compared with March (45%, $n=105$).

Table 1: Changes in online gambling participation by type of gambling, March ($n=235$) and April ($n=199$) 2020

	Less often				More often			
	March		April		March		April	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Betting on sporting events in Australia	78	33.2	43	21.6*	61	26.0	44	22.1
Betting on sporting events overseas	76	32.3	51	25.6	35	14.9	34	17.1
Online card games	52	22.1	31	15.6	44	18.7	41	20.6
Online pokies	51	21.7	32	16.1	46	19.6	41	20.6
Online casino games	53	22.6	29	14.6*	34	14.5	41	20.6
Other online gambling	61	26.0	36	18.1*	45	19.2	45	22.6

*statistically significant difference between March and April ($p<0.05$)

Note: Percentages may not total 100 due to rounding

Source: AIC Online gambling survey [computer file]

Changes in spending on online gambling

Respondents were also asked whether in the last month, compared with the start of the year (January and February), they had spent more, less or about the same on online gambling. In April, 23 percent said they had spent less, compared with 41 percent in March. Perhaps more importantly, 33 percent had spent more on online gambling in April, compared with 20 percent in March. Both sets of results were statistically significant ($p < 0.05$). Taken together, the results suggest that, while fewer respondents were gambling online, those who did were spending more or were less inclined to reduce their spending in April.

Characteristics of those spending more on online gambling

The sociodemographic characteristics of those reporting an increase in spending were examined for both the March and April surveys. Each of the characteristics presented in Table 2 had a statistically significant relationship with increased spending in the given month. For example, in both months, men were significantly more likely than women to increase their spending.

Further statistical testing compared the characteristics of those who increased spending in March and in April. Few differences existed. Those with living circumstances described as 'other' (including those living in shared houses or with parents and single parents living with children) were more likely to have spent more in April than in March, as were those in households earning \$50,000 to \$99,999. However, neither of these factors could explain the increased spending when other factors were taken into account.

Table 2: Characteristics of those spending more on online gambling in March and April compared with the start of the year

		March		April	
		<i>n</i>	%	<i>n</i>	%
Gender	Female	9	1.8	17	3.3
	Male	39	8.0	48	9.8
Age	18–29	16	9.1	15	9.8
	30–39	18	8.7	24	12.8
	40+	14	2.3	26	3.9
Living circumstance	Living alone	12	5.6	5	2.5
	Couple living together with children	27	9.0	37	13.3
	Couple living together without children	5	1.9	9	3.2
	Other	4	1.8	14	5.8*
Employment status	Full-time employment	33	9.0	38	10.8
	Other	15	2.4	27	4.2
Household income	<\$50,000	14	3.8	17	4.9
	\$50,000–\$99,999	11	3.9	20	8.2*
	\$100,000+	22	8.9	26	9.5
	Don't know/prefer not say	1	0.9	2	1.5

*statistically significant difference between March and April ($p < 0.05$)

Note: Percentages may not total 100 due to rounding

Source: AIC Online gambling survey [computer file]

Table 3 shows the factors that influence whether or not individuals spent more on online gambling when controlling for the other variables presented in the table for March and April. In March, being male and being under 40 years of age were both associated with an increased likelihood of spending more on online gambling. Having living circumstances described as 'other' was associated with a reduced likelihood of spending more.

In April, being male and being aged under 40 were again associated with an increased likelihood of spending more, although the strength of the relationship was weaker than in March. The strongest predictor of increased spending in April was living as a couple with children. This was not a significant predictor of increased spending in March.

Table 3: Logistic regression results for factors associated with increased spending on online gambling in April ($n=1,000$) compared with March ($n=1,000$)

Independent variable	Variable category	March ^a		April ^b	
		Odds ratio	<i>p</i> value	Odds ratio	<i>p</i> value
Gender	Male (vs female)	4.63	0.000	3.30	0.000
Age	18–29 (vs 40+)	6.54	0.000	3.99	0.004
	30–39 (vs 40+)	4.76	0.000	2.55	0.000
Living circumstance	Couple living with children (vs living alone)	1.52	0.349	4.75	0.003
	Couple living without children (vs living alone)	0.38	0.090	1.41	0.560
	Other (vs living alone)	0.20	0.011	1.79	0.300
Employment	Full time (vs other)	1.80	0.145	1.33	0.390
Income	\$50,000–\$99,999 (vs <\$50,000)	0.47	0.124	1.14	0.730
	\$100,000+ (vs <\$50,000)	0.71	0.487	0.79	0.563
	Don't know/prefer not to say (vs \$50,000)	0.13	0.058	0.23	0.054
Constant		0.01	0.000	0.01	0.000

a: Nagelkerke $R^2=0.247$; area under the curve=0.84; mean variance inflation factor=1.14; $n=1,000$

b: Nagelkerke $R^2=0.101$; area under the curve=0.79; mean variance inflation factor=1.13; $n=1,000$

Source: AIC Online Gambling survey [computer file]

Conclusion

This study compared the results from two identical surveys conducted in March and April 2020. The results present a mixed picture. On the one hand, fewer individuals reported gambling online in April compared with March. However, among those who did gamble online, fewer gambled less often. This decline in the number of respondents gambling less often was especially pronounced for betting on sporting events in Australia, online casino games and 'other' forms of online gambling. This suggests that, among those who were gambling online in April, any changes in gambling were starting to 'bottom out'—their participation was no longer decreasing.

Of concern was that the proportion of online gamblers who had increased their spending grew between March (20%) and April (33%). In both March and April, being male and being aged under 40 years were associated with increased spending. However, living as a couple with children was particularly related to an increased likelihood of spending more in April. This factor was not significant in March and suggests that something may have changed for those couples living with children in April to result in increased spending on online gambling. It is possible that, for some of those spending more time at home and educating their children online, online gambling may have become an attractive pastime. Indeed, when coupled with the reduced prevalence of online gambling, it is possible that the sharp increase in spending on online gambling during this time, as noted by a number of sources, may have occurred disproportionately in households comprised of couples with children.

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5. COVID-19 pandemic constricts methamphetamine supply in Perth

Alexandra Voce, James Finney, Natalie Gately and Tom Sullivan

The COVID-19 pandemic has had a significant impact on the global economy, public health and day-to-day life (World Health Organization 2020). World leaders have taken drastic measures to limit the spread of the virus, such as the closure of national and state borders (United Nations Office on Drugs and Crime (UNODC) 2020). In Australia, COVID-19 has led to large-scale restrictions on international, interstate and intrastate travel; limitations on trade and social gatherings; mass unemployment across many industries; widespread shortages of household supplies; and disruptions to international mail and air, land and sea freight (Morrison 2020).

The trafficking of illicit drugs and precursor chemicals for their manufacture relies on freight (such as interstate trucking), post, and face-to-face interactions between buyers and sellers. Reports from European countries with strict mobility restrictions have indicated an overall shortage of numerous types of drugs at the retail level, increased prices, reductions in purity, and an increase in consumer substitution of drugs (European Monitoring Centre for Drugs and Drug Addiction and Europol 2020; UNODC 2020). According to the United Nations Office on Drugs and Crime (2020), disruptions to methamphetamine production in Mexico and the European Union have led to a twofold to sixfold increase in methamphetamine prices in these regions. Early indicators from the Burnet Institute suggest methamphetamine in Melbourne continues to be accessible, although almost half of the participants reported weak purity (Dietze & Peacock 2020). Previous 'shocks' to drug supply chains may indicate how the illicit market will react to the COVID-19 pandemic. During 2001, Australia experienced a 'heroin drought' involving a sudden and substantial drop in the availability of heroin, resulting in a notable increase in price and decrease in quality (Degenhardt, Day & Hall 2004; Dietze & Peacock 2020).

Methamphetamine is a drug of national concern in Australia and particularly problematic in Western Australia. Surveys of police detainees suggest that methamphetamine is the most widely available drug in Australia, with two-thirds of those in Perth ($n=682$, 65%) rating the availability as very high (Voce & Sullivan 2019). Methamphetamine is often trafficked into Perth through international, interstate and intrastate distribution networks (Australian Border Force 2018). In response to the COVID-19 pandemic, the Western Australian Government (2020) declared a state of emergency on 16 March 2020, followed by bans on international travel (19 March), interstate travel (5 April) and intrastate travel (31 March). Given Western Australia's geographic remoteness from other states and countries, these border closures had the potential to disrupt the methamphetamine market in a manner similar to the 2001 heroin drought.

Aim

This study aims to examine whether the COVID-19 pandemic was associated with changes in the methamphetamine market in the Perth metropolitan area. Data were collected between April and June 2020 in Perth through the Drug Use Monitoring in Australia (DUMA) program. Although the DUMA program is a national survey conducted quarterly in police stations and watch houses across Australia, data collection had to be suspended in Brisbane, Adelaide and Sydney sites during the early stages of the COVID-19 pandemic for health and safety reasons. Fortunately, DUMA data collection was able to continue in Perth due to the availability of non-contact interview rooms, providing a unique opportunity to examine whether the COVID-19 pandemic was associated with any disruption to the methamphetamine market in Western Australia.

Method

This study uses data collected through the DUMA program from police detainees in Perth during quarter two (April–June) of 2020 ($n=145$), when COVID-19 related restrictions were in force. Detainees' patterns of methamphetamine use and perceptions of the methamphetamine market during quarter two of 2020 were compared with those of detainees interviewed during two reference periods. First, we merged datasets collected during quarter two (April–May) of 2017 ($n=171$), 2018 ($n=201$) and 2019 ($n=204$), described as 2017–19 in this report. This allowed us to calculate the averages across the three preceding years, and adjust for seasonal variations in drug use patterns (eg higher rates of drug use during summer holidays). Second, we used data collected during quarter one (January–February) of 2020 ($n=202$), to represent the period immediately preceding the COVID-19 outbreak in Australia.

Interviews were conducted by trained members of Edith Cowan University's Forensic Interview Team, independent from the police. Data collection was approved by Edith Cowan University's COVID-19 Response Committee. The questionnaire was administered to detainees who had given informed consent in a non-contact interview room in the Perth Police Watch House.

Detainees who reported using methamphetamine in the past 30 days were asked about the availability, quality, price and social supply of methamphetamine during the 30 days before their arrest. Availability was rated on a scale from one (extremely hard or impossible to get) to 10 (readily available or overabundant). Quality was also rated on a scale from one (extremely poor quality or purity) to 10 (excellent quality or purity). These detainees were also asked:

- whether the average price of methamphetamine had increased, decreased or remained stable compared with three months prior;
- whether the number of dealers in the methamphetamine market had changed in the last three months; and
- to estimate how much of their methamphetamine they had sold, shared or given away during the past month.

We also compared the standardised price per point of methamphetamine (total cost of most recent purchase divided by the number of points purchased), and the average quantity purchased, among those interviewed in quarter one versus quarter two 2020. These analyses were restricted to detainees who purchased 'personal quantities' of less than two grams of methamphetamine, based on the quantity threshold for the presumption of intent to supply methamphetamine in Western Australia (Office of the Director of Public Prosecutions for Western Australia 2020). Comparisons of categorical variables were made using Pearson's chi-square, and comparisons of (skewed) continuous variables were made using Wilcoxon's rank sum. To preserve the largest sample size possible, detainees were excluded from analysis only for variables for which data were missing.

Finally, all survey respondents were asked to describe the current methamphetamine market in Perth. Analysis of these data provided more context about the associations between the COVID-19 pandemic and illicit drug markets.

Compared to detainees interviewed during quarter two 2017–19, those interviewed during quarter two 2020 were more likely to be unemployed (79%, $n=114$ vs 67%, $n=383$, $\chi^2(1)=11.4$, $p=0.003$, $\phi=-0.13$) and to have a history of incarceration (50%, $n=72$ vs 39%, $n=219$, $\chi^2(1)=5.2$, $p=0.022$, $\phi=0.09$). The most serious offences recorded against those interviewed in quarter two 2020 were also more likely to be related to violent crime (45%, $n=64$ vs 35%, $n=201$, $\chi^2(1)=4.4$, $p=0.036$, $\phi=0.08$), but less likely to be related to breaches (10%, $n=15$ vs 19%, $n=111$, $\chi^2(1)=6.3$, $p=0.012$, $\phi=-0.09$).

Results

Methamphetamine use during the past 30 days

Thirty-eight percent ($n=55$) of detainees interviewed during quarter two 2020 in Perth reported using methamphetamine in the past 30 days. This was not significantly different to the rate in quarter two 2017–19 (43%, $n=250$, $\chi^2(1)=1.4$, $p=0.233$). But it was significantly lower than the rate in quarter one 2020 (57%, $n=114$, $\chi^2(1)=11.9$, $p=0.001$, $\phi=-0.19$), reversing an upward trend in methamphetamine use among Perth detainees over the past two collection periods. Detainees reported using methamphetamine on a median of five days (interquartile range (IQR)=2–15) in the past 30 days. This frequency of use was significantly less than detainees reported in quarter two 2017–19 (median=15, IQR=3–29, $z=2.9$, $p=0.004$, $d=0.4$) and quarter one 2020 (median=16, IQR=5–30, $z=3.8$, $p<0.001$, $d=0.6$).

Methamphetamine market

The median quality rating for methamphetamine in quarter two 2020 (Figure 1) was three out of 10 (IQR=1–5), significantly lower than average quality ratings in quarter two 2017–19 (median=6, IQR=5–8, $z=6.9$, $p<0.001$, $d=1.2$) and quarter one 2020 (median=6, IQR=4–8, $z=5.9$, $p<0.001$, $d=1.1$). Similarly, detainees rated the availability of methamphetamine during quarter two 2020 as two out of 10 (IQR=1–3). This was significantly lower than availability ratings during quarter two 2017–19 (median=10, IQR=7–10, $z=10.1$, $p<0.001$, $d=2.2$) and quarter one 2020 (median=10, IQR=8–10, $z=9.7$, $p<0.001$, $d=2.6$).

In quarter two 2020, 96 percent ($n=51$) of detainees who had used methamphetamine in the past month indicated the price of the drug had increased in the past three months (Figure 2). In quarter two 2017–19, only a quarter of detainees reported that the price had increased (25%, $n=54$, $\chi^2(1)=90.2$, $p<0.001$, $\phi=0.6$), and in quarter one 2020 the rate was even lower (10%, $n=10$, $\chi^2(1)=105.7$, $p<0.001$, $\phi=0.8$).

Most detainees interviewed during quarter two 2020 who had used methamphetamine in the past month (75%, $n=38$) reported the number of dealers selling the drug had decreased in the past three months (Figure 2). This compares to 13 percent in quarter two 2017–19 ($n=26$, $\chi^2(1)=81.4$, $p<0.001$, $\phi=0.6$) and 13 percent in quarter one 2020 ($n=13$, $\chi^2(1)=58.4$, $p<0.001$, $\phi=0.6$). The methamphetamine users interviewed in quarter two 2020 were also significantly less likely to have shared, sold or given the drug away to other people in the past 30 days (38%, $n=20$) than those in quarter two 2017–19 (54%, $n=134$, $\chi^2(1)=4.8$, $p=0.029$, $\phi=-0.13$) or quarter one 2020 (58%, $n=66$, $\chi^2(1)=6.2$, $p=0.013$, $\phi=-0.19$).

Figure 1: Ratings of methamphetamine availability and quality (median)

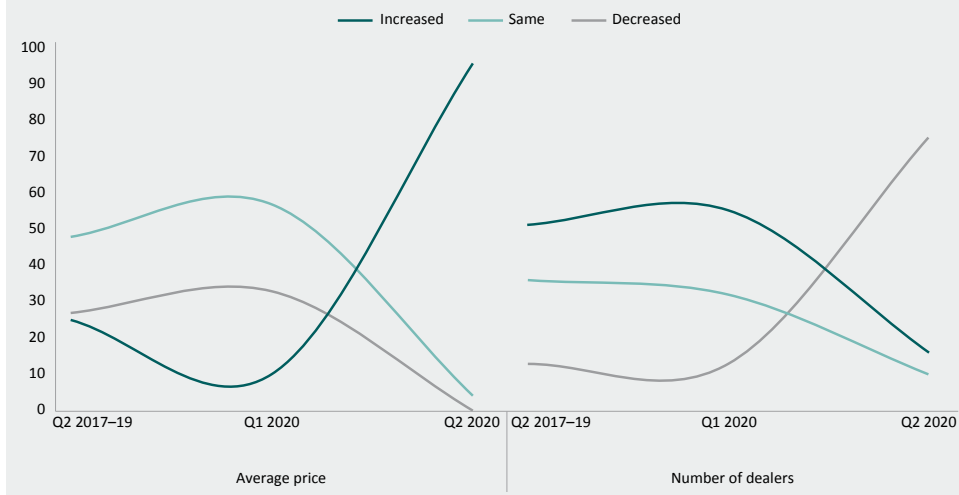


Source: AIC DUMA collection 2017–20 [computer file]

Most recent methamphetamine purchase

In quarter two 2020, detainees reported the median standardised price per point of methamphetamine was \$100 (IQR=\$90–\$150), significantly higher than in January–February 2020 (median=\$30, IQR=\$20–\$50, $z=-8.1$, $p<0.001$, $d=0.04$). Methamphetamine users also reported buying fewer points in their most recent purchase (median=3, IQR=1–5) than those in January–February 2020 (median=5, IQR=2–17, $z=3.0$, $p=0.002$, $d=0.12$).

Figure 2: Perceptions of the methamphetamine market (%)



Source: AIC DUMA collection 2017–20 [computer file]

Other drug use in the past 30 days

In quarter two 2020, nearly two-thirds of detainees (62%, $n=90$) reported using heroin, ecstasy, cocaine, cannabis, inhalants, hallucinogens or non-prescribed medications (benzodiazepines, antipsychotics, steroids, and opiates other than heroin) during the past 30 days. In comparison, 52 percent of detainees interviewed during quarter two 2017–19 reported illicit drug use (other than methamphetamine) during the past month ($n=299$, $\chi^2(1)=4.8$, $p=0.028$, $\phi=0.08$).

Over half of detainees interviewed during quarter two 2020 reported using cannabis (51%, $n=74$), whereas fewer respondents reported using heroin (6%, $n=8$), ecstasy (8%, $n=11$), cocaine (9%, $n=13$), hallucinogens (3%, $n=4$), inhalants (1%, $n=2$), benzodiazepines (8%, $n=12$), opiates (2%, $n=3$) or antipsychotics (1%, $n=1$). Those interviewed during quarter two 2020 were significantly more likely to report ecstasy use and cocaine use compared to detainees interviewed during quarter two 2017–19 (ecstasy use: 3%, $n=17$, $\chi^2(1)=6.7$, $p=0.010$, $\phi=0.10$; cocaine use: 4%, $n=22$, $\chi^2(1)=6.6$, $p=0.010$, $\phi=0.10$).

Detainee comments about the methamphetamine market

Detainees also provided unsolicited comments reinforcing that Perth had experienced a sudden and significant reduction in the availability of methamphetamine. This change was often directly attributed to the restrictions associated with COVID-19. One detainee said: ‘It was fine getting methamphetamine until the coronavirus started. The border restrictions have cut the supply off.’ Respondents also noted a substantial increase in the average price of methamphetamine: ‘The whole drug market has tripled in price because the borders are shut, particularly methamphetamine, as the [intrastate] borders are closed and the drug comes from the north of Western Australia.’

The quality of methamphetamine was also described as poor. Some respondents said dealers were compensating for the scarcity of methamphetamine by adding adulterants to the drug: ‘The quality is shocking and dealers are mixing anything they can into the methamphetamine to try and make more.’ Respondents also said the scarcity of methamphetamine had resulted in more violence and led people to substitute methamphetamine for other stimulants: ‘There is more violence due to people not getting the drugs they need or expect, especially around the lack of methamphetamine.’

Discussion

This study suggests the unprecedented economic and social impacts of the COVID-19 pandemic in Australia may have had significant consequences for Perth’s methamphetamine market. Detainees reported that methamphetamine had become extremely difficult to source in Perth, with fewer dealers selling or sharing the drug. Ratings of methamphetamine availability and quality were the lowest recorded in Perth since the DUMA program introduced these questions in 2013. Detainees suggested the decrease in methamphetamine availability in Perth was due in part to the border closures and travel restrictions introduced to stop the spread of COVID-19.

The price of methamphetamine in Perth also increased more than threefold between quarter one 2020 (an average of \$30 per point) and quarter two (\$100). This inverse relationship between price and availability or quality—in which increased price leads to reduced availability and quality—is a widely documented feature of the illicit drug market, following traditional economic models of demand and supply (Hulme, Hughes & Nielsen 2020).

The proportion of people who reported using methamphetamine in the past month fell by 19 percentage points from quarter one 2020 to quarter two 2020 and declined in comparison with an average of the past three years. Among those who had used methamphetamine in the past month, frequency of use declined from a median of 16 of the last 30 days in quarter one to a median of five days in quarter two 2020. Most methamphetamine-using detainees reported that they had not been able to obtain any methamphetamine in the past month or could not buy and use methamphetamine as often as they had previously.

Detainees were more likely to use non-prescribed drugs or illicit drugs other than methamphetamine during the past month. Although there were some anecdotal reports that people were substituting methamphetamine for ecstasy, the rate of ecstasy use did not differ between quarters one and two 2020. This may have been due in part to the small sample size in quarter two.

Experts have cautioned that an inability to acquire methamphetamine among those who are dependent on the drug may lead to physical and psychological symptoms of withdrawal, which can include violence (Dietze & Peacock 2020). Respondents in this study were more likely to have been arrested for violent offences relative to respondents in previous periods. For people with a history of heavy methamphetamine use, involuntarily abstaining from drug use for a period of time due to reduced availability may lower their tolerance to methamphetamine. This may increase their risk of overdose if the market rebounds and they are again able to access large quantities of methamphetamine (Dietze & Peacock 2020).

In sum, this study presents new evidence that the restrictions and upheaval associated with the COVID-19 pandemic in Australia have disrupted Perth's methamphetamine market. Police detainees reported a shortage of methamphetamine in the region, an increase in the price of the methamphetamine remaining available and a decline in its quality. The DUMA program will continue to monitor the impact of the COVID-19 pandemic on illicit drug markets in Australia, with data collection for quarter three currently being undertaken across sites in Perth, Adelaide, Brisbane and Sydney.

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URLs correct as at July 2020

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6. Predicting repeat domestic violence: Improving police risk assessment

Christopher Dowling and Anthony Morgan

Frontline police spend a substantial portion of their time responding to domestic violence (DV). It is estimated that police attend more than 260,000 DV incidents annually across Australia (Blumer 2016). Police spend between 30 minutes and two hours at the scene of each incident, and an additional one to two hours taking some kind of action in response (eg arrest, referral to services; Crime and Misconduct Commission 2005; Victorian Auditor-General 2009).

The estimated risk of further violence figures prominently in police decisions around how to respond to DV (Kane 2000, 1999). Police increasingly use DV risk assessment tools to standardise, improve and document these predictions. DV risk assessment tools comprise checklists of items reflecting incident, offender, victim and relationship characteristics that are thought to indicate a higher likelihood of repeat DV (Capaldi et al. 2012). Properly designed and empirically validated risk assessment tools can better channel limited police time and resources into the DV cases that most require it, enhance the short-term safety of victims, aid in the investigation of DV incidents by prompting police to collect information on a wider range of factors, and inform the activities of prosecutors and others (Backhouse & Toivonen 2018).

Several tools have been developed for police in Australia, including the Risk Assessment Screening Tool in Tasmania (Mason & Julian 2009), the DV Safety Action Tool in New South Wales (Ringland 2018), and the L17 form in Victoria (Millstead & Coghlan 2016). International tools, including the Ontario Domestic Assault Risk Assessment (ODARA; Lauria et al. 2017) and the Brief Spousal Assault Form for the Evaluation of Risk (B-SAFER; McEwan, Bateson & Strand 2017), have also been examined with Australian samples, and there have been recent national efforts to consolidate and promote consistency in DV risk assessment across Australian jurisdictions (Backhouse & Toivonen 2018).

A substantial body of international research has examined the predictive validity of DV risk assessment tools. This research commonly measures predictive validity using the Area Under the Receiver Operating Characteristic (AUROC) curve score. The AUROC score represents the probability that a randomly selected case with repeat DV will receive a higher risk rating on a prediction tool than a randomly selected case where repeat DV did not occur (Graham et al. 2019; Messing & Thaller 2013). The ODARA has demonstrated the best predictive validity based on this measure, although many tools have returned at least moderate AUROC scores of between 0.60 and 0.75. These tools also rate comparatively well on other measures of predictive validity, including the accuracy with which they correctly classify cases where repeat DV will (sensitivity) and will not (specificity) occur, and the proportions of correctly classified cases across each risk rating (positive (PPV) and negative (NPV) predictive values). However, DV risk assessment tools have generally been shown to be better predictors of when repeat DV will not occur than when it will occur, as indicated by higher specificity and NPV scores.

Australian research has found that most of the risk items included on Tasmania's Risk Assessment Screening Tool and Victoria's L17 tool significantly predict repeat DV (Mason & Julian 2009; Millstead & Coghlan 2016). Additionally, recent analysis of the ODARA (Lauria et al. 2017) and B-SAFER (McEwan, Bateson & Strand 2017) in Victoria returned AUROC scores of between 0.68 (physical abuse) and 0.72 (non-physical abuse) for the former, and 0.63 for the latter. However, a recent analysis of the DV Safety Action Tool using a sample of over 20,000 male and female DV victims in New South Wales, and examining physical and non-physical instances of repeat DV, found AUROCs of between 0.54 and 0.58, indicating this tool performs only slightly better than chance in predicting repeat DV (Ringland 2018).

Critically, few studies to date have controlled for police actions and other short-term responses (eg arrest, protection and other court orders, or health, legal and service responses) in validating these DV risk assessment tools. This is important given the evidence demonstrating that police responses, including apprehending and charging offenders, influence the likelihood of repeat offending (Dowling et al. 2018a; Mazerolle et al. 2018). These responses are implemented differently, and with different intensity, across cases based on their estimated levels of risk, with higher risk cases generally receiving more intensive responses (Belfrage et al. 2012; Belfrage & Strand 2012; Hilton, Harris & Rice 2007; Storey et al. 2014; Trujillo & Ross 2008). Unsurprisingly then, the number and intensity of these responses appears to alter baseline risk ratings throughout a validation study's follow-up period and influence the likelihood of repeat DV across cases with different risk ratings (Belfrage et al. 2012; Belfrage & Strand 2012; Hilton, Harris & Rice 2007; Storey et al. 2014). As such, failing to account for these responses can confound any analysis of a DV risk assessment tool's predictive validity.

Aim and method

In March 2017 Australian Capital Territory Policing began using the Family Violence Risk Assessment Tool (FVRAT). The FVRAT is a 37-item tool that officers are required to complete when responding to a reported incident of violence perpetrated by a current or former intimate partner. Items are weighted based on their professionally-judged importance to the estimation of risk, and reflect the severity of the most recent incident, characteristics of the relationship between the offender and victim, the couple's history of violence, and the offender's criminal history and mental health issues. These items are summed to produce a score reflecting the likelihood of repeat DV: low (0–13), medium (14–27) and high (28+). Officers can revise these ratings based on their own analysis of the information provided. Implementation of the FVRAT is part of ACT Policing's broader effort to meet the objectives of the ACT's inter-agency Family Violence Intervention Program, specifically the identification and protection of (particularly) at-risk victims. ACT Policing mandates that officers prioritise cases based on their risk rating, and proactively implement immediate measures to ensure the safety of victims in higher risk cases.

This study examined the predictive validity of the FVRAT. Its aim was to determine whether the FVRAT's risk ratings accurately predict repeat DV. It employed a relatively short follow-up period, focusing on the FVRAT's predictive validity within six months of a DV report. This is because the intent of the tool was to inform the immediate response of police to DV, and because recent Australian research shows the risk of repeat DV is highest shortly after a DV incident (Morgan, Boxall & Brown 2018). In light of prior research demonstrating the impact of police responses on DV (Dowling et al. 2018a), this study also examined whether controlling for these responses improves the FVRAT's ability to accurately predict repeat DV.

Sample and data collection

The sample consists of 350 reported incidents of violence involving current or former intimate partners in the Australian Capital Territory between March and December 2017. Nine cases were excluded from the sample because of missing data. Reported incidents are unique in that no offender or victim is represented across more than one report in the sample. Where an offender or victim came to the attention of police for DV more than once within the study period, their earliest reported incident was included in the sample.

The first wave of data collection involved manually coding information on DV cases from hard-copy FVRATs and case logs downloaded from the Police Real-Time Management Information System (PROMIS). This information included demographic details of each offender and victim, risk ratings for each item of the FVRAT and an overall score, and details of police and other short-term responses to DV reports in the following six months. Importantly, while officers using the FVRAT are free to revise actuarial risk ratings based on their professional judgement, it became apparent throughout this wave of data collection that this was not occurring.

The second wave of data collection involved extracting data from PROMIS on any further contact victims and offenders had with ACT Policing for DV in the six months following their index report. PROMIS event ID numbers for index DV reports were used to locate the records of any follow-up incidents involving the same victims and offenders.

Over half of offenders (63%) and victims (64%) were between the ages of 25 and 44 at the time of the index DV report, and less than a quarter were older than 55. Offenders were, on average, two years older ($M=35.7$, $SD=10.6$) than victims ($M=33.7$, $SD=10.0$). The vast majority of offenders were male (87%) and victims female (87%). Only four percent of incidents involved violence between current or former same-sex intimate partners. A small proportion of offenders and victims were Indigenous (6% and 5%, respectively) or members of culturally or linguistically diverse groups (12% of both). Equal proportions of cases received low (40%) and medium (38%) risk ratings on the FVRAT, while less than a quarter were rated as high risk (22%). Police arrested the offender in 39 percent of cases and charged the offender in 34 percent of cases, with 41 percent of cases resulting in at least one of these responses.

For the purposes of this study, a repeat DV incident was recorded if at least one additional report of DV was made to police within six months of the index report. If an offender was detained for any period of time following the index report, then the observation period commenced when they were released from custody. Reports were distinguished as DV based on a family violence flag and victim–offender relationship status recorded in PROMIS. Since protection order and bail conditions are applied more often to offenders in higher risk cases (Dowling et al. 2018b; Mazerolle et al. 2018), and it was not possible to include these responses as covariates, technical breaches not involving threatened or actual physical violence were excluded. Eleven percent of victims made at least one additional report of DV within the six month follow-up period. Two-thirds of these cases, or seven percent of the total sample, involved physical violence, as indicated by the presence of at least one offence classified under either Division 2 (acts intended to cause injury) or Division 3 (sexual assault and related offences) of the Australian and New Zealand Standard Offence Classification (Australian Bureau of Statistics 2011). Eighty-eight percent of repeat DV reports involved the offender who perpetrated DV in the index report.

Measures of predictive validity

Logistic regression was used to measure the association between FVRAT risk ratings and repeat DV. The AUROC score was used as the principal measure of the FVRAT's predictive validity. AUROC scores range from 0.50 (meaning the prediction tool is no better than chance at predicting an outcome of interest) to 1 (meaning the prediction tool perfectly predicts an outcome of interest). AUROC scores of 0.80 or above are commonly thought to indicate excellent accuracy, while scores of 0.70–0.79 indicate acceptable accuracy, and scores of 0.60–0.69 indicate moderate accuracy (Hosmer & Lemeshow 2004).

In addition to the AUROC, a number of more specific measures were used to assess the accuracy with which the FVRAT predicts repeat DV (see also Table 1):

- classification accuracy—the total proportion of correct ratings;
- sensitivity—the proportion of repeat DVs correctly predicted;
- specificity—the proportion of non-repeat DVs correctly predicted;
- positive predictive value—the proportion of correct high risk ratings; and
- negative predictive value—the proportion of correct low risk ratings.

Table 1: Measures of predictive validity

		Actual repeat DV?		
		Yes	No	
Predicted repeat DV?	Yes	True positive (tp)	False positive (fp)	PPV tp/(tp+fp)
	No	False negative (fn)	True negative (tn)	NPV tn/(fn+tn)
		Sensitivity tp/(tp+fn)	Specificity tn/(fp+tn)	Classification accuracy (tp+tn)/n

Because the FVRAT classifies cases into three risk ratings, these measures are calculated by comparing low-risk cases with medium- and high-risk cases. While risk assessment tools cannot be used as absolute predictors of repeat DV (high risk \neq will experience repeat DV; low risk \neq will not experience DV), these measures allow different variations of the FVRAT to be compared and the best fitting model to be determined.

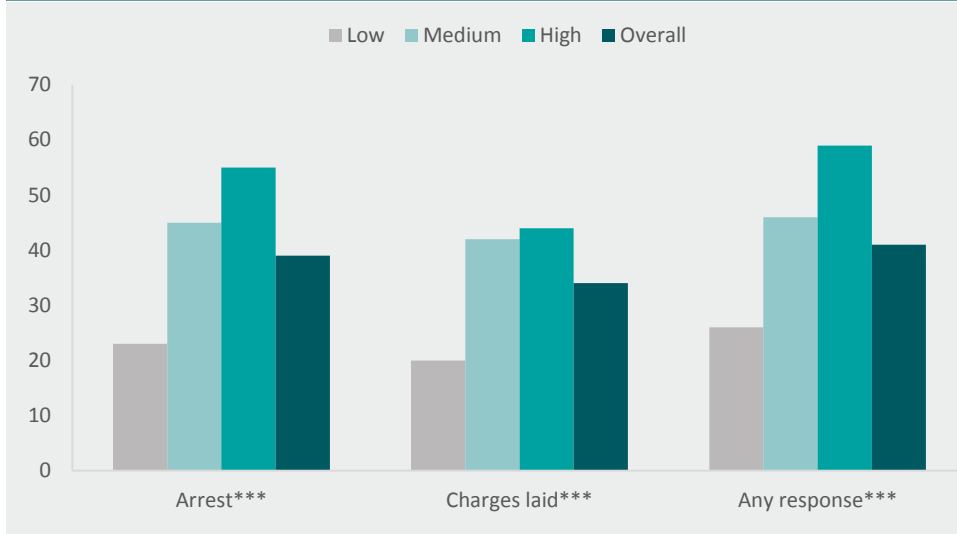
Logistic regression models used initially to investigate the association between risk ratings and repeat DV include police responses to index DV reports as covariates. Individual measures of classification accuracy, sensitivity, specificity, PPVs and NPVs were calculated from predicted probabilities of repeat DV across cases at each risk rating, which were adjusted for covariates using marginal standardisation (Muller & MacLehose 2014). Covariate-adjusted AUROC scores, representing the weighted average of AUROC scores across cases with distinct covariate configurations (Janes & Pepe 2009, 2008), were also calculated.

Results

Risk ratings, police responses and repeat DV

Police responses to index reports were more intensive for cases with higher risk ratings, a pattern which held for both arrests and charges when examined individually (Figure 1). For example, police arrested and/or charged the offender in 59 percent of high-risk cases, compared with 46 percent of medium-risk cases and 26 percent of low-risk cases ($\chi^2(5)=25.0$, Cramér's $V=0.26$, $p<0.001$). Repeat DV rates were generally lower for cases where police arrested and/or charged the offender, both overall and among medium- and high-risk cases, although few of these differences were statistically significant (Figure 2). Meanwhile, rates of repeat DV were similar across low-risk cases that did or did not receive a police response.

Figure 1: Police responses to DV reports, by FVRAT risk ratings (%)

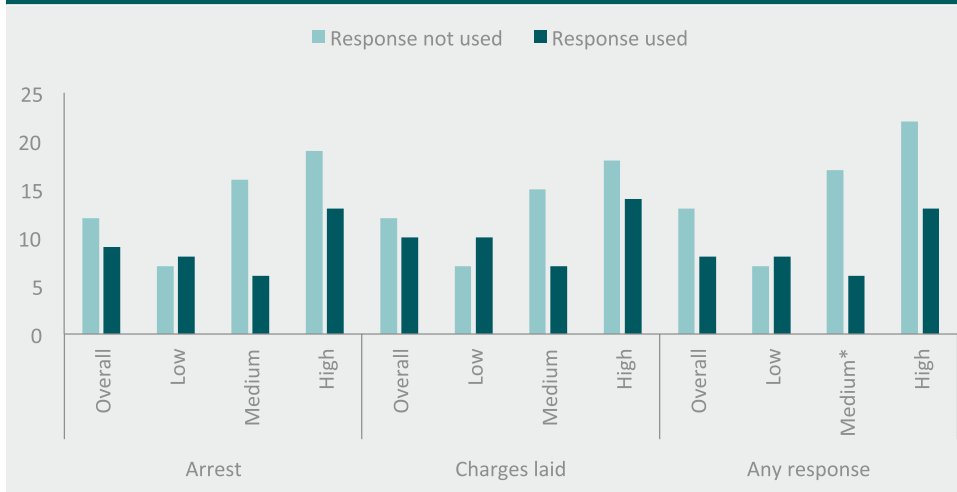


***statistically significant at $p < 0.001$

Note: Arrest $\chi^2(5)=24.8$, Cramér's $V=0.26$. Charges laid $\chi^2(5)=18.4$, Cramér's $V=0.22$. Any response $\chi^2(5)=25.0$, Cramér's $V=0.26$

Source: ACT Policing 2018 [computer file]

Figure 2: Rates of repeat DV, by FVRAT risk rating and police response (%)



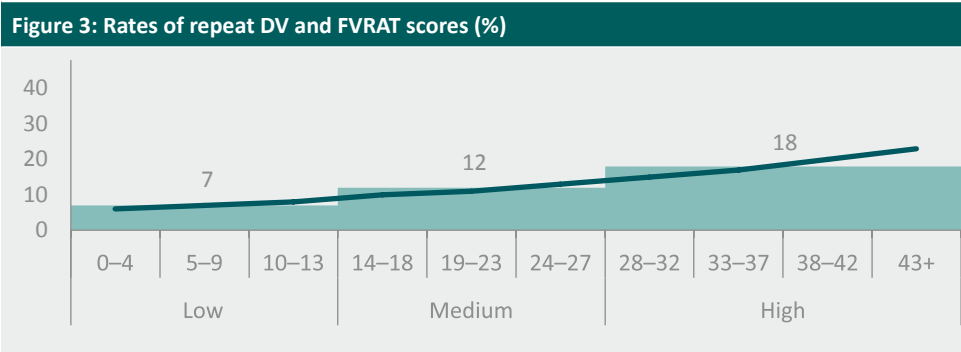
*statistically significant at $p < 0.05$

Note: Any response for medium-risk DV cases $\chi^2(3)=3.8$, Cramér's $V=0.17$

Source: ACT Policing 2018 [computer file]

Predictive validity

Overall, DV cases that scored higher on the FVRAT, and received a higher risk rating, were slightly more likely to result in repeat DV, after adjusting for police responses (Figure 3). Eighteen percent of high-risk cases resulted in repeat DV, compared with 12 percent of medium-risk cases and seven percent of low-risk cases.



Note: Due to the weighting of items on the FVRAT as either 2 or 3, an overall score of 1 is not possible. Rates of repeat DV are based on predicted probabilities, which take into account the police response to the index incident

Source: ACT Policing 2018 [computer file]

After controlling for police responses, the odds of repeat DV within the six-month follow-up period were significantly higher in cases rated as high risk than in cases rated as low risk (OR=2.96, CI=1.18–7.43; Table 2, Model 2). There was no significant difference in the odds of repeat DV between medium- and low-risk cases. Controlling for police responses resulted in a slight improvement to the FVRAT’s AUROC score. However, even after controlling for police responses, the AUROC score indicates that the FVRAT is little better than chance at predicting repeat DV (AUROC score=0.60, CI=0.49–0.69). In other words, there is only a 60 percent probability that a randomly selected DV case where repeat DV occurred received a higher risk rating on the FVRAT than a randomly selected case where repeat DV did not occur.

The FVRAT correctly classified 67 percent of high- and low-risk DV cases. Of those cases where repeat DV occurred, 60 percent were correctly classified as high risk (sensitivity) and, of those cases where repeat DV did not occur, 68 percent were correctly classified as low risk (specificity). Additionally, of cases that received a high risk rating, 19 percent resulted in repeat DV (PPV). Among cases that received a low risk rating, 93 percent did not result in repeat DV (NPV).

Table 2: Logistic regressions predicting repeat DV from risk ratings, and AUROC scores

	FVRAT ratings (original)		FVRAT ratings (revised)	Empirical ratings	
	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)	Model 5 OR (95% CI)
Risk ratings					
Medium (vs low)	1.60 (0.71–3.59)	1.82 (0.78–4.22)	3.72 (1.09–10+)*	3.07 (1.19–7.87)*	3.70 (1.37–9.93)**
High (vs low)	2.38 (0.1.01–5.44)*	2.96 (1.18–7.43)*	10+ (2.47–10+)**	10+ (3.96–10+)**	10+ (5.46–10+)**
Covariates					
Any response	–	0.51 (0.24–1.08)†	0.52 (0.26–1.07)†	–	0.36 (0.16–0.83)*
	Model 1 statistics	Model 2 statistics	Model 3 statistics	Model 4 statistics	Model 5 statistics
Constant	0.08 (0.05–0.16)***	0.09 (0.05–0.18)***	0.04 (0.01–0.15)***	0.04 (0.02–0.10)***	0.05 (0.02–0.12)***
Model χ^2 (df, n)	3.93 (2, 350)	6.39 (3, 350)	12.98 (3, 350)*	21.95 (2, 350)***	24.61 (3, 350)***
Nagelkerke R^2	–	–	0.07	0.12	0.16
AUROC score (95% CI)	0.59 (0.47–0.68)	0.60 (0.49–0.69) ^a	0.64 (0.55–0.72) ^a	0.70 (0.60–0.79)	0.73 (0.60–0.81) ^a

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

a: Covariate-adjusted

Source: ACT Policing 2018 [computer file]

An empirical method of categorising continuous variables proposed by Barrio and colleagues (2017) was then used to identify the optimal cut-off points for the FVRAT's low, medium and high risk ratings. Starting with a population of potential cut-off points for a continuous predictor of a dichotomous outcome, this approach uses an evolutionary algorithm to successively identify gradually more refined generations of cut-off points with better AUROC scores than preceding generations until an optimal cut-off point is identified. This analysis was performed using the R package 'CatPredi' (Barrio et al. 2017), with police responses included as covariates. Revised FVRAT risk ratings based on this method (low 0–9=21%; medium 10–39=72%; high 40+=7%) returned only a marginally improved covariate-adjusted AUROC score of 0.64 (CI=0.55–0.72; Table 2, Model 3).

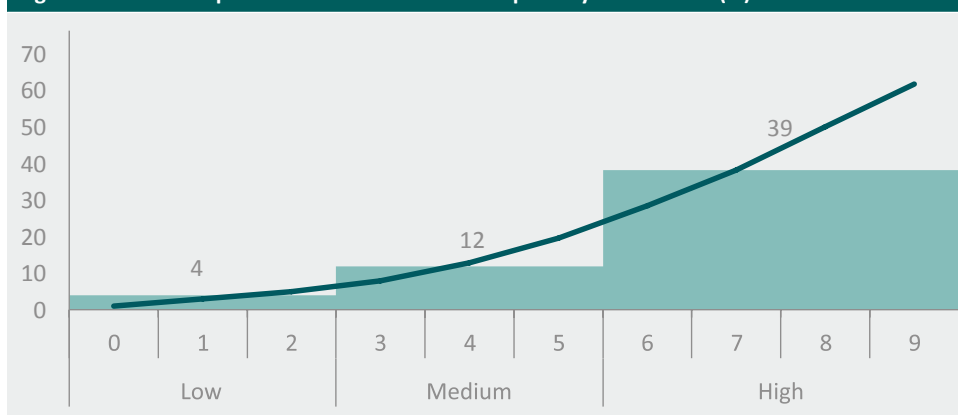
Additional analyses were undertaken to develop and test an empirically refined risk assessment tool using only the FVRAT items that were individually associated with a higher likelihood of repeat DV.

Controlling for police responses, 10 FVRAT items were positively associated with repeat DV. (Results are available from the authors on request.) These items are as follows:

- Offender has assaulted the victim during the most recent incident;
- Offender has injured or threatened to injure a family pet now or in the past;
- Victim was physically injured during the most recent incident;
- Victim and offender have recently separated after cohabiting;
- There is a pregnancy or new birth (less than 12 months) within the relationship;
- The offender has assaulted the victim in the past;
- The violence level in the relationship has escalated (violence includes property damage);
- Offender has committed offences of violence against any person in the past;
- Offender has breached a protection or any court order now or in the past;
- Offender has money problems at the moment.

Scores on these items were re-dichotomised (0=no, 1=yes) and summed for each case, returning a total score between zero and 10. Barrio and colleagues' (2017) empirical categorisation method was used to determine the optimal cut-off points for low, medium and high risk ratings on this empirically refined predictive tool. The results showed that cut-off points of 2.4 and 5.4 were optimal for categorising cases. These scores were rounded and used to classify cases into low (0–2=40%), medium (3–5=47%) and high (6+=11%) risk groups. Analysis of the cases in each of the risk categories created using this refined tool revealed a gradual and consistent increase in the covariate-adjusted rate of repeat DV (Figure 4).

Figure 4: Rates of repeat DV and scores on the empirically refined tool (%)



Note: No cases scored 10. Rates of repeat DV are based on predicted probabilities, which take into account the police response to the index incident

Source: ACT Policing 2018 [computer file]

There was a significant and positive association between police responses (both overall, and for arrest and charge) and empirical risk ratings, similar in magnitude to the association between these responses and the original FVRAT risk ratings ($p < 0.001$ for all, Cramér's $V = 0.24$ – 0.26). Additionally, the use of any response by police was significantly associated with a lower likelihood of repeat DV in cases classified as medium risk (17% vs 6%, $p < 0.05$, Cramér's $V = 0.17$) and high risk (53% vs 23%, $p < 0.05$, Cramér's $V = 0.30$), but not low risk (3% vs 5%, $p = 0.71$).

Controlling for police responses, the odds of repeat DV within the six-month follow-up period were significantly higher in cases rated as medium risk ($OR = 3.70$, $CI = 1.37$ – 9.93) and high risk ($OR = 10+$, $CI = 5.46$ – $10+$) than in cases rated as low risk on the empirically refined tool (Table 2, Model 5). There was a small improvement in the AUROC score for the empirical risk ratings once police responses were taken into account, from 0.70 ($CI = 0.60$ – 0.79 ; Table 2, Model 4) to 0.73 ($CI = 0.60$ – 0.81 ; Table 2, Model 5). This also represents a notable improvement in predictive validity over the original FVRAT risk ratings ($AUROC = 0.60$; Table 2, Model 2). Based on the empirically refined tool, there is a 73 percent probability that a randomly selected case where repeat DV occurred received a higher risk rating than a randomly selected case where repeat DV did not occur.

Importantly, the AUROC for the three-category empirically refined tool was equal to or higher than the AUROC generated for versions of the tool using between two and eight risk categories. Given the impracticality of employing a large number of categories to guide police responses (which only marginally improves the AUROC) the three risk ratings were retained. (Results are available from the authors on request.)

Analysis of the sensitivity, specificity, PPV and NPV of the empirically refined tool also showed it significantly improved upon the original FVRAT. A comparison of medium- and low-risk DV cases indicates that half were correctly classified (50%). Of those cases where repeat DV occurred, 77 percent were correctly rated as medium risk (sensitivity), although only 48 percent of those where repeat DV did not occur were correctly rated as low risk (specificity). Predictions that repeat DV would occur ($PPV = 12\%$) or would not occur ($NPV = 96\%$) differed substantially in accuracy.

Further analysis indicates that over four-fifths of high-risk and low-risk DV cases were correctly classified (83%). Where repeat DV occurred, 73 percent were correctly classified as high risk (sensitivity), while 84 percent of cases where repeat DV did not occur were correctly rated as low risk (specificity). Additionally, the high risk category is better than the medium risk category at predicting repeat DV, relative to the low risk rating ($PPV = 39\%$).

Finally, items shown to be related to the risk of repeat violence (particularly fatal violence) were incorporated into the refined tool. These items included the involvement of alcohol and drugs, mental illness and strangulation. Adding these items, either separately or in combination, did not improve AUROC scores. (Results are available from the authors on request.)

Conclusion

How well does the FVRAT predict repeat domestic violence?

The findings of this study highlight the strengths and limitations of the FVRAT, along with potential avenues for its further development.

Finding: the FVRAT is not a strong overall predictor of further domestic violence.

The current FVRAT risk ratings are marginally better than chance at predicting further DV, as measured by repeat DV reported to police within a six-month follow-up period. The covariate-adjusted AUROC score (0.60) falls just within the range generally considered moderate, although it is lower than the scores of most other Australian and international tools (Lauria et al. 2017; Mason & Julian 2009; Messing & Thaller 2013; Millsteed & Coghlan 2016). Furthermore, empirically optimised risk ratings based on the full FVRAT produced an AUROC score only marginally better (0.64).

Finding: the FVRAT is better at predicting when repeat DV will not occur than when it will occur.

Examining only those DV cases classified as high or low risk using the FVRAT indicates that, while two-thirds were correctly classified, this was principally due to the correct classification of low-risk cases (specificity=68%, NPV=93%). Repeat DV occurred in only one-fifth of cases rated as high risk (PPV=19%). Importantly, 40 percent of cases where there was further DV were incorrectly classified as low risk (sensitivity=60%). False positives, where cases are incorrectly categorised as high risk, have significant resource implications for police and other agencies. However, it is important to note that, while police responses were controlled for in this study, other criminal justice and service responses were not, which may account for at least some of these false positives. Additionally, false negatives—cases classified as low risk where repeat violence does occur—mean that a victim may not be protected from further harm.

Finding: empirically refining the FVRAT substantially improves its predictive validity.

Using statistical analyses, the FVRAT was refined to its 10 most important items and optimal risk ratings were identified. This empirically refined tool was markedly more accurate than the original FVRAT. The AUROC score (0.73) is comparable to those of the better performing DV risk assessment tools such as ODARA (Graham et al. 2019; Messing & Thaller 2013), and by commonly accepted standards indicates acceptable predictive validity. This is particularly significant given the focus of this study was predicting repeat DV in the short term, when risk is highest (Morgan, Boxall & Brown 2018).

Finding: the empirically refined tool is better at predicting when repeat DV will occur, and just as accurate in predicting when it will not.

When DV cases classified as medium and high risk were compared with those classified as low risk, there was a notable increase in sensitivity. Around three-quarters to four-fifths of cases where repeat DV occurred were correctly classified into higher risk categories. Additionally, when examining high- and low-risk cases specifically, there is a substantial improvement in the PPV, with over a third of high-risk cases resulting in further DV (39%). These improvements, at least in relation to high- and low-risk cases, do not appear to have come at the expense of this tool's ability to correctly predict no further DV. Four-fifths of cases where there was no further violence were correctly classified as low risk (specificity=84%), and almost no low-risk cases resulted in further violence (NPV=96%).

Recommendations, limitations and future research

Findings suggest that the accuracy of the FVRAT can be improved by narrowing it down to a small number of important items. This would improve its predictive validity while giving frontline police a tool that is quicker and easier to use. For police, improving the tool's sensitivity is particularly important, as greater sensitivity means fewer victims 'slipping through the cracks' and experiencing further harm despite police assessing them as being at lower risk.

Many of the items identified in this report as important in predicting repeat DV were also found to be important in prior Australian research on DV risk assessment. These items relate to the severity of the violence in the most recent DV incident (eg physical assault), histories of violence (eg prior violence, escalating violence in the relationship, prior breaches of orders) and certain relationship stressors such as separation and financial difficulties (Lauria et al. 2017; Mason & Julian 2009; Millsteed & Coughlan 2016; Ringland 2018). This strengthens the argument for restricting the FVRAT to these items.

Importantly, a number of items that were found to be predictive in this prior research were not significant predictors of short-term repeat DV in the current study—namely alcohol/drug use and psychological health issues. While police responses aimed at deterring repeat DV were controlled for in this study, health and service responses that address these factors were not. Referrals to these services may be offered more persistently, and taken up more often, by offenders or victims who present with one or more of these risk factors, suppressing any direct association with repeat DV, particularly in the short term. Alternatively, the presence and extent of these complex factors may be difficult for frontline police to assess, potentially compromising the validity of this information.

Critically, this study did not assess the value of FVRAT items outside of their importance in predicting repeat DV in the short term. Items that did not emerge as predictive of short-term repeat DV may nevertheless be important in predicting longer term repeat DV, escalations in DV severity, or DV homicide. Additionally, items may still have investigative value to police even if they do not contribute to prediction, and could also inform the assessments and responses of others in the criminal justice system and services sector (Dowling & Morgan 2018). Items with some demonstrated or potential value to police decision-making, investigations or responses could be incorporated more explicitly into the currently under-utilised post-hoc procedures for reviewing and revising FVRAT risk ratings, or even as a supplementary tool to the FVRAT. For example, prior incidents of strangulation and suicide ideation by the offender have been identified as significant risk factors for DV homicide (Glass et al. 2008; Sherman et al. 2016), while alcohol use is generally associated with more severe acts of violence and escalating frequency and severity of violence (Sutherland, McDonald & Millstead 2016). These items might be used to inform judgements regarding the need to prioritise offenders and victims for immediate intervention.

The results of this study provide further, albeit tentative, support for the importance of accounting for police and other short-term responses when measuring the accuracy of DV risk assessment tools. However, as the goal of risk assessment is not just to predict but to effectively target responses and ensure victim safety, evaluations of DV risk assessment tools should extend beyond prediction, and also examine whether they assist with risk-guided efforts to reduce DV (Backhouse & Toivonen 2018).

It is important to note the limitations of this study. Due to the sample size and low base rate of repeat DV, it was not possible to examine the FVRAT's ability to predict different types of repeat DV, or DV among victims or offenders of particular demographic characteristics such as gender or sexual orientation. While there are many similarities in the risk factors for repeat DV across these groups, some differences have been found, highlighting the importance of further research examining the validity of the FVRAT (eg Hilton et al. 2014; Lauria et al. 2017; Ringland 2018).

Further, this study does not analyse the reliability of the FVRAT to determine whether it gives a consistent measure of risk on different occasions (test–retest reliability) or for different users (inter-rater reliability) or information sources (victim vs administrative information). Any future validations of the FVRAT should include some form of reliability analysis, as limitations to its consistency will limit the accuracy with which it predicts repeat DV.

Finally, it should be noted that various forms of information readily available to police (eg criminal history patterns and demographic information) have been shown to predict repeat DV (eg Morgan, Boxall & Brown 2018; Richards et al. 2014). Additional research should compare the predictive validity of the FVRAT with the use of this information to ensure the former can enhance the police response over and above the information officers already have available to them.

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7. Policing repeat domestic violence: Would focused deterrence work in Australia?

Anthony Morgan, Hayley Boxall, Christopher Dowling and Rick Brown

Despite significant investment by government in new methods of preventing domestic violence reoffending, levels of violence experienced by victims remain unacceptably high. In 2017–18, around one in five offenders proceeded against by police had at least one domestic or family violence related offence (Australian Bureau of Statistics 2019), while rates of self-reported domestic violence victimisation—which are less susceptible to changes in reporting—have remained relatively stable since 2005 (Australian Bureau of Statistics 2017).

There is widespread agreement that achieving a long-term, sustainable, population-level reduction in domestic violence requires investment in primary prevention (Department of Social Services 2019), and there is early evidence of success in changing attitudes (Webster et al. 2018). However, with one woman killed every nine days and one man killed every 29 days by an intimate partner (Australian Institute of Health and Welfare 2019), more than 320,000 victims of domestic violence a year (Australian Bureau of Statistics 2017) and police attending a domestic violence incident every two minutes (Blumer 2016), effective short-term responses are critical to ensure the safety of current and future generations of victims.

Unfortunately, interventions designed to reduce domestic violence in the short term have been found to have limited effectiveness. Programs that provide effective support for victims do not necessarily reduce repeat offending or even victimisation (Dowling et al. 2018a; Mazerolle et al. 2018). Men's behaviour change programs have moderate success (Babcock et al. 2016). And police responses to domestic violence can reduce offending, but not in all circumstances, and there is little rigorous evidence from Australia (Dowling et al. 2018b; Mazerolle et al. 2018).

There is now growing support overseas for programs applying a focused deterrence model to reduce different forms of violence (Abt 2019). Briefly, this approach involves strategically applying law enforcement, providing social services and mobilising the community's moral voice, informed by detailed problem analysis (Braga, Weisburd & Turchan 2018). Recently, the Intimate Partner Violence Intervention (IPVI) has applied a focused deterrence approach in several US communities to address domestic violence. Early pilots have shown evidence of its effectiveness in reducing the most severe forms of domestic violence reported to the police (Sechrist & Weil 2018; Sechrist, Weil & Shelton 2016).

In response to recent well-publicised calls to seriously consider the potential of intervention models based on focused deterrence (Hill 2019), this chapter draws on the latest Australian research to examine if and how this approach could be incorporated into policing methods used in Australia. For the purpose of this chapter, domestic violence is defined as physical and non-physical forms of violence and abuse (eg psychological, financial and verbal) targeted at current or former intimate partners.

Focused deterrence and ‘pulling levers’: Strong theoretical and empirical foundations

Originally conceived as a project to reduce youth gun homicides in Boston, widely known as Operation Ceasefire (Braga et al. 2001), the focused deterrence framework has been implemented in dozens of cities across the United States. It has been used to address ‘gang’ violence, gun violence, drug market violence, prison violence and, most recently, domestic violence.

Program components and underlying theory

There are several program components that underpin the focused deterrence approach to violence, irrespective of the setting. These are:

- identifying a specific crime problem to be prioritised for action;
- establishing an inter-agency group involving local agencies such as police, corrections and social services;
- undertaking detailed analyses of data on offenders and groups;
- communicating directly with targeted individuals and groups to notify them that they are being closely monitored, inform them of the consequences of their behaviour and highlight action taken against other offenders;
- improving victim and offender access to support services and offering support to offenders to help them change their behaviour; and
- drawing on the full suite of legal actions available to law enforcement and other agencies to stop the offending behaviour of the most prolific and serious offenders (the ‘pulling levers’ component).

Although focused deterrence models are led by local law enforcement agencies, in close collaboration with partner agencies, this approach extends beyond traditional notions of deterrence within criminal justice settings. While deterrence traditionally relies on formal detection, prosecution and punishment to deter offenders, focused deterrence relies on sanctions perceived as swift and certain—factors that influence behaviour more than punishment severity (Kennedy, Kleiman & Braga 2017). Importantly, while the focus is on holding offenders accountable, procedural justice and increasing the perceived legitimacy of authorities are seen as integral to encouraging compliance (Dai, Frank & Sun 2011; Epstein 2002; Nagin & Telep 2017). Further, community voices are mobilised to oppose violence as a means of informal social control. Finally, the focused deterrence model requires the provision of support services before legal action is taken, rather than post-charge or conviction, as is often the case with criminal justice interventions.

Evidence of effectiveness

There is compelling evidence that focused deterrence approaches are effective in reducing a range of violent crime types (Braga et al. 2001; Braga, Weisburd & Turchan 2018; Sechrist, Weil & Shelton 2016). Early results from Operation Ceasefire demonstrated a reduction of more than 60 percent in youth homicide (Braga et al. 2001). A recent systematic review of focused deterrence approaches observed a positive result in 19 out of 24 included studies, while the meta-analysis, which pooled the results from multiple studies, revealed a statistically significant, moderate effect on crime (Braga, Weisburd & Turchan 2018). It was particularly effective in reducing serious violence among persistent reoffenders, including those involved in group violence.

In their meta-review of community violence prevention strategies, Abt and Winship (2016) concluded that focused deterrence strategies had the largest direct impact on crime and violence of any of the interventions they reviewed. Recently, Abt (2019: 87–88) argued:

...nothing works as well to reduce urban violence as focused deterrence...It does not work perfectly, it does not work every time, but it works better, on average, than anything else out there.

Applying focused deterrence to domestic violence: The Intimate Partner Violence Intervention strategy

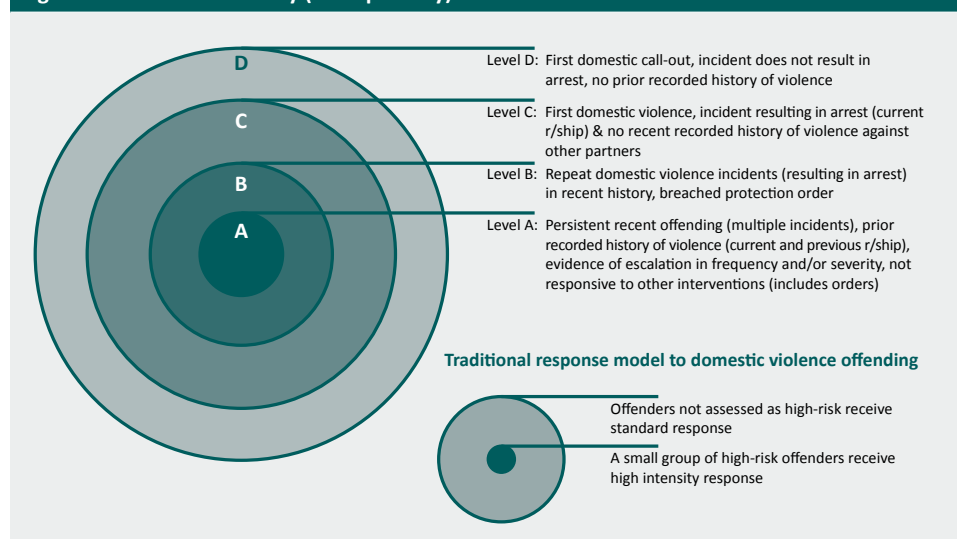
Kennedy (2004) examined whether the focused deterrence/pulling levers approach to street group violence could be adapted to the problem of domestic violence. He argued that traditional approaches to domestic violence placed too great a burden on the victim while demonstrating little evidence of effectiveness. Further, there was evidence that, as with other forms of violence, a small group of domestic violence offenders were responsible for a disproportionate number of incidents and the most serious offending. The most prolific domestic violence offenders also tended to be generalist offenders, also committing other types of crime. Kennedy (2004) therefore argued in favour of developing a focused deterrence and pulling levers strategy specifically for domestic violence.

This led to the development of the IPVI. Detailed descriptions of the model are available elsewhere (see National Network for Safe Communities 2017; Sechrist, Weil & Shelton 2016). Briefly, the IPVI draws upon the same focused deterrence model used for other types of violence, but with some specific adaptations that ensure its relevance to domestic violence. This includes a 'parallel affirmative outreach' response to victims, while still focusing on offender accountability. The direct, face-to-face communication with offenders that is central to the focused deterrence model remains a major part of the strategy; however, this is supported by direct communication with victims as well. When action is taken against the offender, immediate outreach is provided to victims, both to assess their safety and to offer support services.

Underpinning this approach is an offender hierarchy—a set of criteria for determining the nature and intensity of responses to be targeted at an offender and victim (Figure 1). More prolific or more serious offenders are prioritised for action and receive more intensive responses. The most dangerous offenders may be incapacitated through any legal means possible, whether for domestic violence offences or other actionable offences, such as breaching community-based orders or weapons offences (the 'pulling levers' approach). Other offenders receive a less intensive response. Figure 1 shows the IPVI hierarchy adapted using Australian data on patterns of repeat offending reported to the police. For comparison, it also illustrates the more traditional response, whereby high-risk offenders receive a high intensity response, while other domestic violence offenders receive a standard legal response.

Examples of actions that may be taken by law enforcement are presented in Table 1. Note that these examples—which, once again, may be tailored to the local setting—are not unique to the IPVI. The unique feature of the IPVI is the highly structured and parallel delivery of intervention and support services for both the offender and the victim.

Figure 1: Offender hierarchy (example only)



Source: Adapted from Teicher & Ott 2019

Note: Criteria are examples only; criteria should be developed based on detailed analysis of offender and offending patterns within local areas

Table 1: Law enforcement actions and parallel victim outreach protocol (example only)

Level	Law enforcement action	Victim outreach protocol
A	Legal action by any means available. Law enforcement may employ 'pulling levers' non-domestic-violence actions that do not require victim cooperation or that produce more effective sanctions than domestic violence options.	Victims assessed on-scene for emergency needs and offered all available support and services.
B	Offender must attend 'call-in' meeting where they receive moral and legal message against domestic violence as well as offer of help. Law enforcement message includes an explicit warning about enhanced agency attention offenders are now exposed to, including 'pulling lever' actions mentioned above.	Victim receives notice before offender is called in. Victim advocates conduct risk assessment and safety planning.
C	Police meet with offender face-to-face to communicate deterrence message explaining IPV and legal consequences of further offending such as increased bail conditions (or revoking bail), enhanced prosecution, and tightened probation conditions.	Victim notified of available services. Victim advocates make in-person visits to offer services.
D	Offender receives letter from the police detailing close police monitoring, community moral message against domestic violence and personal legal consequences of further offending.	Victim receives letter from the police explaining IPV and available services. Victim advocates conduct outreach.

Note: This protocol is based on the IPV offender hierarchy reported by the National Network of Safe Communities (2017), rather than the modified hierarchy reported in Figure 1

Source: National Network for Safe Communities 2017: 3

Although the level of intervention that offenders and victims receive is dictated by the offender's assessed likelihood of reoffending, it is important to note that all domestic violence offenders and victims are subject to some level of response. This means that all offenders, even first-time or low-level offenders, are the subject of legal and community sanctions, and all victims receive some level of support. In this way, focused deterrence represents a shift in the way we respond to all domestic violence incidents that come to the attention of the police, not just those involving the most prolific and dangerous offenders and the most vulnerable victims.

The actions undertaken as part of a focused deterrence model, such as those described below, are in addition to any criminal justice responses to recorded violence, such as arrest and prosecution for physically assaulting a partner. Focused deterrence models are not intended to replace formal legal proceedings.

Consistent with the focused deterrence model, the intended actions of police and partner agencies are directly communicated to offenders and victims. Offenders are told what to expect if the behaviour continues and, critically, police and their partners follow through on the promised course of action.

A central feature of the IPVI, and focused deterrence models more generally, is the 'call-in'. This forum gives all partners involved in the project, including prominent community representatives (eg victims of crime advocates), an opportunity to confront offenders about their behaviour, explain what will happen if it continues and offer support to help them change their behaviour. Call-ins also allow representatives to communicate strong community norms that persistent abusive behaviour will not be tolerated. Specifically, community representatives tell offenders:

- domestic violence affects everyone, not just you and your partner;
- violence and abuse is wrong and is not consistent with our community values—the community condemns your behaviour in the strongest terms;
- the community cares about what happens to you and wants to help you; but
- if you reoffend, the community stands behind the police and supports them to protect victims from further violence.

Outside of the call-in, contact between the police and partner agencies with offenders and victims occurs on an ad-hoc basis, particularly when risk of violence increases. Lower-risk offenders and victims may not be required to attend in-person meetings with the IPVI partners. Instead, the core messages of call-ins (including community norms against domestic violence) are communicated through letters, or in-person contact with police officers.

The IPVI remains a relatively new intervention approach, and there has been limited evaluation of its impact. Results from the pilot site in High Point, North Carolina indicate a significant reduction in serious domestic violence—most notably, a substantial fall in intimate partner homicide (Sechrist, Weil & Shelton 2016). Moreover, there was a reduction in calls to police for domestic violence, a decrease in arrests, and a decrease in victim injuries related to domestic violence arrests (Sechrist & Weil 2018). Based on these early results, the IPVI has been identified as a promising approach to reducing domestic violence offending and related harms, and the US Office on Violence Against Women has provided funding to replicate the High Point model in other locations (Office on Violence Against Women 2018).

Would this work in Australia?

The section that follows draws on contemporary Australian research exploring both patterns of domestic violence offending and reoffending reported to the police, and the efficacy of police responses to domestic violence, to describe the arguments in favour of piloting a focused deterrence model in a local context. It also considers potential barriers to implementation.

Arguments in support of the focused deterrence approach

Repeat domestic violence offending is concentrated among certain offenders and places

Australian research shows that a relatively small proportion of domestic violence offenders are responsible for a disproportionate number of incidents (Hulme, Morgan & Boxall 2019; Kerr, Whyte and Strang 2017; Millstead 2016). For example, Millstead (2016) found that over a five-year period, seven percent of offenders in Victoria were responsible for 31 percent of all reported domestic violence incidents. Meanwhile, in the Northern Territory, eight percent of couples accounted for 35 percent of all reported incidents over a four-year period (Kerr, Whyte & Strang 2017). A relatively small number of perpetrators also appear to be responsible for the majority of domestic violence related harm. Sherman and colleagues (2016) found that two percent of domestic violence offenders reported to the police in Western Australia were responsible for 50 percent of the associated harm.

Likewise, although it impacts all communities in Australia, repeat domestic violence offending is concentrated in certain places (Di Bartolo 2001; Fitzgerald & Graham 2016; Rahman 2018). Victims in the most disadvantaged communities are significantly more likely to experience repeat domestic violence than those living in the least disadvantaged communities, based on studies of both officially reported and self-reported violence (Fitzgerald & Graham 2016; Rahman 2018). Di Bartolo (2001) found that the average number of police domestic violence calls was higher in areas characterised by lower levels of employment and family income and higher measures of multiple disadvantage. This may reflect a broader issue of structural disadvantage and the lack of informal resources and support (Voce and Boxall 2018), meaning police contact provides an important opportunity to intervene and improve access to vital support services.

This research suggests that more intensive interventions should be directed at more prolific offenders and offenders in communities where harm is concentrated to generate the most significant reductions in violence.

Repeat domestic violence offending rates are persistently high

A recent review of Australian domestic violence offending studies (Hulme, Morgan & Boxall 2019) showed that estimates of domestic violence reoffending are remarkably consistent. When measured using police apprehension data, around half of offenders committed a further domestic violence offence within four years (Kerr, Whyte & Strang 2017; Millstead & Coghlan 2016). Studies using court conviction data reported general offending rates (ie not limited to domestic violence offending) as high as 60 percent within three years (Hulme, Morgan & Boxall 2019; Trevena & Poynton 2016). Further, the re-analysis of Tasmanian data reported by Morgan, Boxall and Brown (2018) showed that more than half of all police-recorded domestic violence incidents (54%) in 12 months involved a recidivist offender. Therefore, it is vital to develop interventions that hold perpetrators accountable and break the cycle of abuse experienced by many victims.

Risk of repeat offending and threat to victim safety is highest in the short term

While rates of repeat offending are high, they are not evenly distributed over time (Boxall & Morgan 2020; Kerr, Whyte & Strang 2017; Morgan, Boxall & Brown 2018; Poynton et al. 2016). Australian research conducted by Morgan, Boxall and Brown (2018) showed that the risk of repeat offending peaks in the weeks and months immediately following an offence. More specifically, the probability of reoffending peaked at around four weeks following the index incident. Similar results were found in a larger sample of adolescent domestic and family violence offenders (Boxall and Morgan 2020). This evidence suggests that swift responses that protect victims during this highest risk period offer the best opportunity to reduce repeat victimisation.

Indeed, over the past 10 years, government strategies have reinforced the importance of timely responses to hold perpetrators accountable (NSW Department of Attorney-General and Justice 2012). Police-issued protection orders (Australian Law Reform Commission 2010) and the Fast-Tracking Initiative of the Magistrates Court of Victoria, in which criminal proceedings for family violence matters are finalised within 16 weeks (Magistrates Court of Victoria 2014), are examples of practices introduced to provide a rapid response to domestic violence to protect victims from further harm.

Risk increases with each repeat offence

Much of the research into the risk of repeat offending has based the assessment of risk on a single event, taking into account prior history, situational factors, and offender, victim and relationship characteristics (see, for example, Fitzgerald & Graham 2016). What is evident, however, from recent research is that risk is not static. Instead, the risk of repeat domestic violence offending increases with every incident of violence. This pattern has been observed among both adult domestic violence offenders and young people who use family violence, and in different jurisdictions (Boxall & Morgan 2020; Morgan, Boxall & Brown 2018). The intensity of responses therefore needs to increase with each reoffence, and in response to escalating violence (eg non-fatal strangulation, threats to harm children), which is consistent with the approach taken by the IPV1.

Prior violence is a strong predictor of future violence

The maxim 'past behaviour is the best predictor of future behaviour' is as true for domestic violence offending as it is for offending more generally (Bulbeck et al. 1997; Fitzgerald & Graham 2016; Millstead & Coghlan 2016; Trimboli 2015). Two recent Australian studies have found that the frequency of prior offending is a strong predictor of reoffending within six months (Boxall & Morgan 2020; Morgan, Boxall & Brown 2018). Even when other factors are controlled for, prior offending is an important risk factor for reoffending, as shown in several studies of the predictive validity of risk assessment tools used in Australia (Dowling & Morgan 2019; Mason & Julian 2009; Millstead & Coghlan 2016; Ringland 2018). Prior breaches of protection orders are also a clear risk factor for future violence (Mason & Julian 2009).

Domestic violence offenders are often generalist offenders

There are undoubtedly factors that contribute to domestic violence that are unique to this type of offending (Fulu et al. 2013). These include attitudes towards violence against women (and women more generally), the power imbalance between male and female partners (particularly financial) and adherence to gender stereotypes (Fulu et al. 2013; Heise 1998). However, many of the risk factors for domestic violence are similar to those for other forms of violence and for crime more generally (Capaldi et al. 2012). It is unsurprising, therefore, that many domestic violence offenders are 'generalist' offenders, meaning they commit a wide range of offences (Boxall, Payne & Rosevear 2015; Millstead & Coghlan 2016; Ringland & Fitzgerald 2010). Weatherburn and Rahman (2018) found that two-thirds of domestic violence offenders in New South Wales had a conviction for a non-domestic violence offence. Meanwhile, Dowling, Boxall and Morgan (forthcoming) found that more than nine in 10 male domestic violence offenders proceeded against by the NSW Police Force had been proceeded against for other types of offences.

While Weatherburn and Rahman (2018) concluded that strategies designed to deter or incapacitate domestic violence offenders might help to reduce other forms of crime, it is also possible that policing strategies targeting other types of criminal offending might help to reduce domestic violence. This is part of the rationale for the pulling levers component of the focused deterrence approach, where other legal sanctions are used to deter or incapacitate offenders, particularly when there are barriers to the successful prosecution of domestic violence offences.

Traditional legal responses to domestic violence do not always reduce short-term violence

Police perform a vital role as frontline responders to domestic violence incidents, and act as the gateway to the criminal justice system. Police have at their disposal a number of legal responses that may help to reduce the short-term risk of repeat offending. The most obvious of these is arrest and removal of the offender from the home. They can also detain an offender in custody for a period of time, release them on bail, or oppose bail when they appear in court. Police may also perform targeted patrols or compliance checks in relation to protection orders and bail conditions.

Despite the important role of police as first-responders, there is limited Australian research on the impact of police practices on domestic violence offending (Dowling et al. 2018a). Further, the international research on police responses has produced mixed results. We know that mandatory arrest practices (common in the US) can be harmful to victims (Sherman & Harris 2013) and that the impact of arrest is variable (Mazerolle et al. 2018). Conversely, victim reporting to police and police attendance at domestic violence scenes may be effective in reducing repeat violence (Dowling et al. 2018a).

Protection orders are a common legal response to domestic violence in Australia, and the number of orders granted by courts in several jurisdictions over the past few years has increased (NSW Bureau of Crime Statistics and Research 2019; Crime Statistics Agency 2020). They are intended to act as a specific deterrent to further abuse, particularly during high-risk periods (eg during separation, post-arrest and prior to court). Overall, only a minority of protection orders are breached by offenders (Poynton et al. 2016). A recent systematic review found that protection orders can reduce the prevalence and severity of repeat domestic violence (Dowling et al. 2018b). However, the same study found that orders are less effective in certain circumstances, including where offenders have a history of violence, or when victims have ongoing ties to the offender (eg shared children or ongoing relationships).

Taken together, these findings suggest that traditional criminal justice sanctions for domestic violence may not prevent repeat domestic violence, at least not in all circumstances. Criminal justice sanctions like protection orders, arrest and incarceration remain an important component of the focused deterrence approach, particularly given the emphasis on offender accountability; however, these sanctions are supported by clear deterrent messages, a tailored response to both offenders and victims, and strong community messaging.

A focus on procedural justice leads to better outcomes

A key concept underpinning the focused deterrence approach is procedural justice, which emphasises the importance of neutrality, respect, fairness and giving people a voice during police encounters with offenders, victims and members of the public (Tyler 2011). International evidence on the importance of procedural justice is growing, with a clear relationship between citizen perceptions of police legitimacy, trust and confidence, and satisfaction with police and with outcomes from interactions with police (Donner et al. 2015). There also appears to be an association with increased legal compliance (Nagin & Telep 2017). There is evidence that these findings also apply to domestic violence matters, with some research showing an association between procedural justice and increased satisfaction with legal outcomes among both victims and offenders (Gover, Brank & MacDonald 2007). There is even evidence that, when police act in a procedurally fair manner when arresting domestic violence perpetrators, rates of subsequent violence decrease (Maxwell et al. 2019; Paternoster et al. 1997). These findings even extend to domestic violence offenders who have been incarcerated as a result of their violence (Maxwell et al. 2019).

Focused deterrence is consistent with contemporary Australian responses to domestic violence

To the best of our knowledge, focused deterrence and pulling levers approaches have not been implemented in Australia in response to any type of crime. However, similar programs have been implemented.

In the early 2000s, South Australia Police trialled a new approach targeted at reducing repeat domestic violence victimisation. The model was adapted from work undertaken by West Yorkshire Police in the United Kingdom (Hanmer, Griffiths & Jerwood 1999; Lloyd, Farrell & Pease 1994) and involved classifying victims into a three-tier system, primarily using the number of prior incidents. An evaluation of the program found that repeat victimisation decreased, and there was an overall eight percent reduction in the rate of domestic violence (Morgan 2004).

More recently, the NSW Police Force implemented Operation Solidarity in Bourke as part of the larger Maranguka Justice Reinvestment Project, a major focus of Hill's (2019) recent argument in favour of short-term responses to domestic violence. Operation Solidarity involves a combination of home visits, proactive enforcement of protection orders, and engagement with support agencies to provide offenders and victims with access to services. Early evaluation results suggest a reduction in short-term repeat victimisation (Moore 2018), while the impact assessment of the overall Maranguka Justice Reinvestment Project conducted by KPMG (2018) revealed that both the number of domestic violence incidents and the reoffending rate among domestic violence offenders had fallen significantly since Operation Solidarity was implemented.

These are not the only examples of proactive policing models targeting high-risk offenders currently operating in Australia. Several jurisdictions have now implemented high-risk offender targeting teams or case prioritisation that allows for more proactive and intensive responses to prolific and serious offenders. These jurisdictions include New South Wales (Family and Community Services 2019), Queensland (Department of Child Safety, Youth and Women 2019), and Victoria (Victoria Police 2019).

Similarly, integrated responses to domestic violence—involving two or more agencies, including police, working together to deliver a coordinated service to victims of domestic and family violence—are well established in Australia. They have been subjected to extensive evaluation, with some promising results (Breckenridge et al. 2016). This includes second responder programs, in which police and victim advocates visit victims after the initial police response to provide information and support. Second responder programs are effective in increasing victim disclosure of violence and use of support services; however, there is mixed evidence on whether they reduce repeat violence (Dowling et al. 2018a; Mazerolle et al. 2018).

What distinguishes these current practices from focused deterrence is the latter's highly structured approach to targeting both offenders and victims, the deliberate and direct communication of risk and social norms as a way of deterring repeat offending, and the parallel delivery of graduated interventions to offenders and victims as part of a single response model. Further, focused deterrence models ensure that all domestic violence offenders are subject to some level of legal and community sanctions and messages—not just those at highest risk.

Limitations of the model and issues to consider

Relevance of a model developed in the United States

Context is important. What works in the United States may not work in Australia, or it may need to be changed to suit the local context.

Different actors would need to be involved in delivering an Australian model, which may vary between states and territories and communities. Consideration will also need to be given to community representatives, and how a call-in process might operate. These are all vital issues to consider to ensure that a focused deterrence model could motivate behaviour change among offenders.

The offender hierarchy—including the thresholds for moving between categories and the information that is included when making these assessments—would have to incorporate risk assessment tools and frameworks used by local police agencies (Dowling & Morgan 2019; Mason & Julian 2009; Millsteed & Coghlan 2016; Ringland 2018), and state and territory and national risk assessment principles and guidelines (Toivonen & Backhouse 2018). It is important that different systems are not in conflict with one another. This is particularly important given the significant investment in the development and refinement of risk assessment tools across the country. It is imperative that this hierarchy be developed to suit the local context using local data, particularly as there is evidence of geographic variation in rates of repeat offending (Hulme, Morgan & Boxall 2019).

Balancing certainty with complexity

In a focused deterrence model, the nature and intensity of the response to both offenders and victims is based on the offender hierarchy and the likelihood of further violence. This hierarchy is also central to the deterrence messages for offenders; they are told explicitly that if they continue to offend they will be subject to increasingly serious sanctions.

This highly structured approach, and the emphasis on swift and certain responses, is critical to offender accountability and changing the behaviour of perpetrators. And, as this chapter has outlined, it is well supported by evidence regarding patterns of repeat offending.

However, there is also growing recognition of the complex dynamics within abusive relationships. Relying on simple models of reoffending may risk undermining efforts to protect victims from further harm. Like most risk assessment tools, the offender hierarchy is based primarily on the likelihood of further reoffending; however, it does not identify those offenders whose violence is escalating in severity. Both dimensions of risk need to be considered. For example, an integrated risk assessment tool developed by Dowling and Morgan (2019) for ACT Policing includes 10 items for predicting repeat domestic violence within six months, and a series of ‘red flags’—factors associated with more severe violence. These ‘red flags’ include strangulation, coercive controlling behaviour, alcohol/drug use and mental health problems. Police can use these items to prioritise cases for immediate, intensive intervention, regardless of the offender’s risk rating.

Further, there is increasing recognition that desistance from offending, including domestic violence, does not happen over a short period. Most offenders do not just stop offending; rather, desistance is a process involving periods of de-escalation and relapse (Maruna 2001). There has been limited consideration as to how this desistance process should be accommodated within the offender hierarchy, or how interventions designed to reduce domestic violence should respond to violence that decreases in frequency or severity, but does not stop entirely.

Perceptions of police among highest risk populations

The effectiveness of the focused deterrence approach hinges, at least in part, on the perceived legitimacy of law enforcement. The negative perceptions of police in certain communities in Australia, such as among Aboriginal and Torres Strait Islander people (Cunneen 2006), LGBTQI+ people (Miles-Johnson 2015) and culturally and linguistically diverse communities (Sivasubramaniam & Goodman-Delahunty 2008) have been well documented. Negative perceptions of law enforcement are also common among victims of domestic violence more generally (Australian Bureau of Statistics 2017; Ragusa 2013). The reasons for these perceptions are complex and have been influenced by both historical and contemporary events. It is beyond the scope of this study to explore the origins of these perceptions, which have been subjected to extensive analysis elsewhere (see, for example, Cherney 1999; Cunneen 2008).

These negative perceptions may undermine the effectiveness of interactions between police and offenders or victims from these communities. However, the focused deterrence model has been applied in largely black communities in the United States, where there is a long history of racial tensions with law enforcement (Brunson 2007). As Kennedy, Kleiman and Braga (2017) have written, even in this context it has been possible to effectively acknowledge past harms while also engaging positively with offenders in some of the most disaffected communities.

There may be challenges associated with communicating deterrence messages to certain groups. Effective implementation of focused deterrence messages in Australia will require partners—including law enforcement—to acknowledge past harms and to follow through on promises made with respect to offers of help and support, for both victims and offenders.

Tension around the use of incarceration

There is also a need to manage the risks associated with the use of incarceration, and the potential for ‘net-widening’. Evidence shows that toughening policies on domestic and family violence may have contributed to the steep rise in imprisonment (Weatherburn 2018). Few would argue against holding offenders accountable, and incarceration has obvious benefits in protecting victims from persistent violent offenders. There are undoubtedly circumstances where incarceration is the only option available for protecting the safety of victims. However, it is not the only penalty available. Swift and certain are far more important than the severity of the punishment. Kennedy, Kleiman and Braga (2017) argue that strict enforcement of community-based sentences and order violations may also work effectively.

The issue of incarceration (and criminal justice sanctions more broadly) is particularly important to consider for Aboriginal and Torres Strait Islander people, who may be disproportionately targeted through focused deterrence models. This is not by design but a function of Indigenous over-representation in both domestic violence offender and victim populations (Hulme, Morgan and Boxall 2019). Indigenous people are over-represented in every stage of the criminal justice system, controlling for other factors (Douglas & Fitzgerald 2018). Any criminal justice response to domestic violence, particularly if it is led by police, requires careful planning to ensure that already marginalised communities are not disproportionately targeted and negatively impacted as a result. The same is true of focused deterrence models.

Responding to coercive controlling behaviour

The IPVVI aims to reduce overall levels of recorded domestic violence by focusing on the most serious and prolific violent offenders and victims at the greatest risk of harm. Offenders are targeted on the basis of their contact with police for domestic violence offending. As a police-led multi-agency response, it is necessarily narrowly focused on the public safety outcomes it sets out to achieve. It may not—at least not directly—reduce coercive controlling behaviour by offenders who commit only non-physical forms of violence, such as psychological abuse, which is less likely to come to the attention of police (Kennedy, Kleiman & Braga 2017; Voce & Boxall 2018). But this is not to suggest that these other forms of violence are ignored when police, victim support services and other agencies come into contact with offenders and victims as part of this model. The question for practitioners is how to take these other behaviours into account when the offender hierarchy is applied and the level of intervention determined, particularly in light of recent evidence regarding the history of coercive controlling behaviour in cases of femicide (Monckton Smith 2019).

It is well recognised in Australia and internationally that physical and non-physical forms of domestic violence are harmful and have significant impacts on victims and their families (Coker et al. 2000; Lacey et al. 2013). This is reflected in the broad definitions of domestic violence included in state and territory legislation, as well as the National Plan to Reduce Violence against Women and Their Children. That focused deterrence models are likely to primarily deal with physically violent domestic violence offenders and their victims should not preclude a trial in Australia.

Integration with other responses

Focused deterrence is not an alternative to other methods of reducing violence, such as primary prevention and perpetrator interventions (eg men's behaviour change programs). These programs fulfil a vital role as part of a holistic approach to preventing domestic violence. However, they operate on different time frames and at different stages. Primary prevention, focused on issues such as increasing gender equity and promoting healthy and respectful relationships during adolescence, aims to achieve generational change in attitudes towards women (Department of Social Services 2019). Similarly, perpetrator interventions have a longer term focus and can take months or even years to finalise.

Responses to domestic violence must address the different drivers of violence, the intersection between domestic violence victimisation and other vulnerabilities, and the different forms of violence and abuse that can occur. No intervention can reduce all forms of violence. Granted, focused deterrence approaches will not influence offender attitudes towards women, but this is not necessary to produce short-term behavioural change and reduce the immediate risk to victims. Interventions like focused deterrence must be delivered alongside primary, secondary and tertiary responses targeting individuals and communities, and these interventions should not be seen as being in competition with one another. Focused deterrence has the potential to fulfil an important role in preventing the recurrence of violence and abuse in the highest risk period following a report to police (Boxall & Morgan 2020).

Conclusion

A strong evidence base, derived from a growing body of Australian research, supports the adoption of a focused deterrence approach to domestic violence. The same patterns of violence and offender characteristics that motivated David Kennedy to develop the IPVVI exist within Australian communities and offender populations. The evidence presented in this chapter suggests that many of the characteristics of domestic violence used to inform the development of the IPVVI—namely, the concentration of offending, the high rates of repeat offending, the generalist nature of prolific offenders, and the dynamic nature of risk—are not unique to the United States. Rather, contemporary research indicates that the conditions necessary to implement a focused deterrence regime are equally relevant in Australia.

This approach is not a significant departure from contemporary policing responses that have been implemented in Australia. Several police agencies have already implemented high-risk targeting teams, and partnerships between law enforcement and support services are a feature of Australian responses. The distinction between these responses and focused deterrence is the highly structured approach to targeting offenders and victims for intervention, the shared focus on both offender accountability and support for victims, the delivery of graduated responses based on the recent history of violence and risk of reoffending, and the emphasis on mobilising community voices to oppose violence by prolific offenders. Consistent with current Australian practice, all domestic violence victims and offenders are the subject of an intervention, albeit of varying intensity, not only those assessed as being at highest risk.

The strong theoretical and empirical foundation of focused deterrence approaches makes a compelling case for piloting it in Australia. Nevertheless, there are potential challenges to implementation that need to be taken into consideration when designing programs. However, they should not act as barriers to trialling this approach. None of the issues identified in this paper is insurmountable.

The evidence presented here suggests there would be benefit in testing the focused deterrence and pulling levers approach to reducing domestic violence reoffending in an Australia pilot site. This would need to be developed with a local community, supported by willing partners, implemented with fidelity to the IPVI (and principles of focused deterrence more broadly), and subject to rigorous monitoring and evaluation.

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8. Australians who view live streaming of child sexual abuse: An analysis of financial transactions

Rick Brown, Sarah Napier and Russell G Smith

Introduction

In 2016, officers from Queensland Police Service's Taskforce Argos conducted a raid at the home of a 58-year-old man. The Campbelltown District Court later found that the man had been paying a woman in the Philippines to engage her two young daughters in sexual abuse, which he watched and directed live via the video communication platform Skype. The children were just two and seven years old when the abuse began, and it continued for almost five years (Cormack 2019b). The Australian man pleaded guilty to a number of offences including procuring a child for sex and engaging in sexual activity with a child under 16 outside Australia (Cormack 2019a).

Since the offender's sentencing in May 2019 the Australian Federal Police (AFP) revealed they have seen several other cases where Australians allegedly paid for and directed the sexual abuse of children abroad as they watched from their homes using popular live streaming platforms (Cormack 2019b). According to Europol and the Australian Transaction Reports and Analysis Centre (AUSTRAC), live streaming of child sexual abuse (CSA) is largely financially driven (AUSTRAC 2019; Europol 2019). However, little is known about the patterns in payments for CSA live streaming.

Background

What we know about live streaming of child sexual abuse

Live streaming of CSA is also known as 'webcam child sex tourism/abuse' (Masri 2015; Puffer et al. 2014; Terre des Hommes 2014), 'cybersex trafficking' (International Justice Mission 2019) and 'live distance child abuse' (AUSTRAC 2019; EFC 2015). Media articles reported live streaming of CSA occurring in the Philippines as early as 2008 (de Leon 2013). Given live video streaming platforms (and adult webcam sex shows) have been available to the public since the early 2000s, it was likely occurring even earlier than this.

Yet empirical research on the characteristics of CSA live streaming and those who engage in it is scarce. Law enforcement reports and research by non-government organisations (NGOs), investigative journalists and academics have shed some light on the issue (see the annotated bibliography of Maxim et al. 2016). The Internet Watch Foundation (IWF) conducted an international analysis of over 2,000 image and video captures from live streamed sexual abuse of children from August to October 2017 (IWF 2018). It used a snowball sampling technique that began with seed URLs for investigation. The IWF retrieved the seed URLs from its historic dataset and via search engines, entering keywords identified via the IWF Hotline to identify child sexual abuse material (CSAM). The IWF reviewed seed URLs manually to identify material that matched the study criteria. Analysis revealed that 98 percent of victims in the sample were aged 13 years or younger, and 28 percent were aged 10 years or younger. Of all the captures, 40 percent were classified by the IWF as containing serious sexual abuse, including the rape and torture of children (IWF 2018).

CSA live streaming is distinct from other child sexual abuse material shared on the internet due to the 'real time' element. Offenders often request how they want the child to be sexually abused either before or during the live streaming session (Açar 2017; ECPAT International 2017; Europol 2019; GACSAO 2016). According to Puffer et al. (2014), the impact on the victim is similar to childhood sexual trauma which includes traumatic sexualisation, betrayal and powerlessness. A study involving interviews with investigators of CSAM cases cited the challenges this crime poses for law enforcement, as live streaming leaves no visual evidence of the abuse apart from session logs and data usage trails. Police often rely on money transfers and call logs for evidence in an investigation (ECPAT International 2018). The legal and technological barriers to monitoring CSA live streaming in real time have also been noted (Açar 2017). In cases where the live streaming session is recorded and shared online, it contributes to the growth of child sexual abuse material available on the internet (Europol 2019).

While this crime occurs in multiple countries (Europol 2019), the Philippines has been identified by global law enforcement agencies, NGOs and academics as the 'hub' from which CSA live streaming emanates (AUSTRAC 2019; ECPAT International 2017; EFC 2015; Europol 2019; Puffer et al. 2014). NGOs attribute this to the poverty, English language proficiency, well-established remittance services and strong internet coverage in the Philippines (Batha 2016; ECPAT International 2017; Puffer et al. 2014).

Transactions for live streaming of child sexual abuse

In November 2019, CSA live streaming gained heightened attention in Australia when the financial intelligence agency AUSTRAC took legal action against Westpac Bank in respect of over 23 million alleged breaches of the *Anti-Money Laundering and Counter-Terrorism Financing Act 2006* (Cth). Westpac was accused of failing to monitor \$11b worth of suspicious transactions, including those to the Philippines suspected to be for child sexual exploitation (Butler 2019).

A recent AUSTRAC intelligence report identified indicators of transactions involving CSA, including CSA live streaming. The indicators came from an intelligence-based analysis of investigations into Australians who made payments to known facilitators of CSA abroad (usually an adult who had access to the child victim). Indicators identified were: small transactions between \$15 and \$500, no identifiable pattern in transactions, no work or family links to countries to which a suspect was sending funds, travel to high-risk destinations, use of innocent payment descriptions (including 'accommodation', 'school', 'uniform', 'medical bills') and payments for access to a virtual private network (VPN), other encryption software and live streaming software (AUSTRAC 2019). It is important to note these are intelligence-based indicators flagged for law enforcement agencies to conduct further investigation.

Unlike the majority of offenders who share CSAM on the internet (Europol 2019), 'facilitators' of CSA live streaming almost always receive payment (AUSTRAC 2019; EFC 2015; Europol 2019; Masri 2015). Research suggests the cost of viewing CSA live streaming in the Philippines is often low (Masri 2015), due to the poverty of those who provide the services (see also Maxim et al. 2016, citing Wight 2016, who reported parents allowing access to young girls for €2 per day). The European Financial Coalition against Commercial Sexual Exploitation of Children Online (EFC) consulted with key NGOs on the issue. One NGO suggested payment amounts for a CSA live streaming session usually ranged from 500 to 2,000 Philippine pesos (approximately \$14–\$57 Australian; EFC 2015). This low cost of CSA live streaming appeals to sexual predators in developed countries wishing to avoid the risk of physically sexually abusing children. On the other hand, Europol flagged CSA live streaming as a potential risk factor for travelling to sexually offend (Europol 2016), as some consumers seek to abuse a child viewed in a live streaming session in person. However, no empirical research has investigated this.

How prevalent is live streaming of child sexual abuse and is it increasing?

While there are no available data on the prevalence of CSA live streaming, anecdotal evidence suggests global demand is high and that the crime is growing. In 2013, four researchers from Terre des Hommes Netherlands posed as pre-pubescent Filipino girls on 19 different online chat forums. Over a 10-week period, 20,172 people from 71 different countries asked the researchers posing as children to perform a webcam sex show. In the majority of interactions, only text communications occurred, but for a small proportion the researchers used a custom-designed and programmed computer model named 'Sweetie' to retrieve identifying information from predators (Terre des Hommes 2014).

In 2016, the Global Alliance against Child Sexual Abuse Online (GACSAO) administered a questionnaire to 33 member countries asking about online child exploitation. Respondents from 16 out of 19 countries who had investigated CSA live streaming stated that the number of cases had increased over the last five years (GACSAO 2016). Similarly, in 2019 the Virtual Global Taskforce (VGT) undertook a global survey of its members and partner agencies, which include law enforcement, NGOs and industry partners. Three out of nine law enforcement members and two out of three other members noted that CSA live streaming had increased in the last three years (VGT 2019). The spread of CSA live streaming has been attributed largely to the increase in high-speed internet and availability of affordable phones and other devices in developing countries (ECPAT International 2017; VGT 2019; WeProtect Global Alliance 2019).

Escalation of offending

While CSA live streaming is always harmful to victims, no research has explored whether the offending of consumers escalates over time in terms of the seriousness of the abuse (eg from viewing the children nude to requesting penetration/rape) or the age or number of victims. Some studies have focused on escalation of offending among consumers of other CSAM online. Quayle and Taylor (2002) conducted interviews with 13 males convicted of child sexual abuse material offences, finding the majority reported escalating from less extreme to more extreme forms of CSAM. Respondents' perceptions of this escalation included viewing images of younger children, viewing more serious forms of abuse and moving from 'legal' to 'illegal' material. One respondent described it as a 'downward trend' (Quayle & Taylor 2002: 343).

Davis, Lennings and Green (2018) analysed the categories of child sexual abuse material found in possession of a sample of convicted CSAM offenders. Although it was not possible to determine the order in which the images were accessed, they found that some offenders possessed material from both the lower and higher levels of the Combatting Paedophile Information Networks in Europe (COPINE) Scale (in which higher levels include rape and torture; Quayle 2008), suggesting a possible progression to more harmful material.

Given the reported growth in CSA live streaming cases, it is appropriate to study this phenomenon more closely. One promising methodology involves analysing the payments consumers make for CSA live streaming sessions. Understanding of transaction patterns can then be used to deter and disrupt sessions and, potentially, to assist in law enforcement action.

Research questions

Given that little systematic research has examined the nature and extent of CSA live stream offending, and none has examined Australian offenders, this research used existing Australian law enforcement intelligence datasets to examine two primary research questions:

- What is the profile of Australian CSA live streaming offenders, including demographic characteristics and criminal history?
- What is the pattern of financial transactions by Australian offenders who view CSA live streaming? Specifically, what is the frequency and average value of transactions, what is the relationship between criminal history and number of transactions made, and do these transactions change over time in a way that indicates escalation of offending?

To answer these questions, the research drew on the resources of three government agencies: the Australian Federal Police, the Australian Criminal Intelligence Commission and AUSTRAC.

Method

Data sources

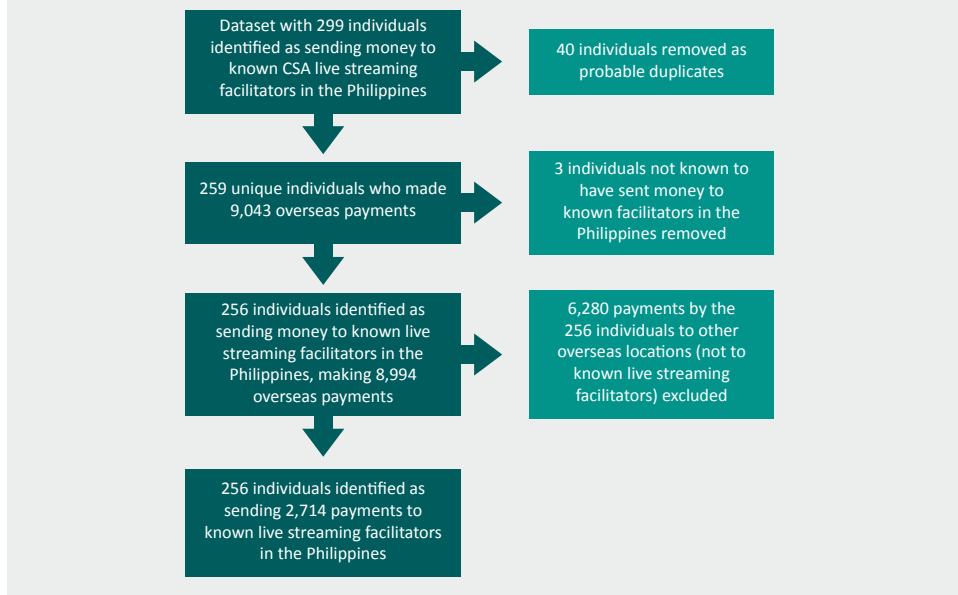
AUSTRAC collects and stores financial transaction data on individuals and businesses in Australia to identify financial crime. This includes transaction amounts and dates, receiver details (including country), payment type, payment provider details and demographic data of the payer and risk-related information on suspicious transactions. The Australian Criminal Intelligence Commission (ACIC) collects and stores criminal history information on individuals in Australia via the National Police Reference System (NPRS), among other types of data used by law enforcement. Information stored in the NPRS includes all prior charges and convictions, including the precise dates of offending, as well as demographic data on suspects and offenders (ACIC 2019). These data sources have been compiled for intelligence purposes and are subject to limitations as to the accuracy and verifiability of the data they contain.

In 2018, the Philippine National Police and the Philippine National Bureau of Investigation provided the AFP with a list of 118 persons arrested in the Philippines for facilitating the sexual exploitation of children. This sample is not representative of all individuals in this country or elsewhere who might have links to CSA. The AFP provided the names of these facilitators to AUSTRAC, who analysed AUSTRAC holdings. AUSTRAC identified 299 Australian-based persons who had sent funds to the 118 known facilitators of child sexual exploitation in the Philippines. At the time of identification, some of the 299 Australians had already been arrested for child sexual offences including paying to watch children sexually abused via live stream from the Philippines. Others are currently under investigation. As such, not all individuals in the study were convicted of or charged with CSA live streaming offences, although all were under investigation at the time of analysis.

Data extraction and matching

AUSTRAC provided selected transaction data on the 299 Australian-based individuals to the Australian Institute of Criminology for the purpose of the current study. AUSTRAC first sent the transaction data to the ACIC, which linked the data with criminal history data in the NPRS using a names and dates of birth algorithm. Any 'weak' matches were reviewed manually and a match decision was made. Once linked, the ACIC removed all identifying information (such as names/addresses and other potentially identifying information) of all suspects from the AUSTRAC and NPRS data before sending it to the Australian Institute of Criminology for analysis. A number of data cleaning routines were performed, and the final number of individuals included was reduced to 256 after removing duplicates or missing information. The remaining 256 individuals sent 2,714 payments to CSA live streaming facilitators in the Philippines (see Figure 1).

Figure 1: Sample development



Source: Philippines CSA live stream financial transaction dataset

Limitations

There are a number of limitations with this methodology that need to be considered. First, and most fundamentally, we cannot be sure every transaction was for CSA live streaming. For example, it is possible that some transactions were for contact sexual offending against children (if offenders travelled to the Philippines) or for live adult webcam shows not involving children. Payments may also have been made for other non-sexual purposes. However, consultations with the AFP suggest it is unlikely the transactions were for contact sexual offending given such purchases are usually made with cash in the destination country. Also, adult live webcam show workers would not normally require a facilitator to receive payments, as they can do this on their own. Further, the offences the facilitators in the Philippines were arrested for on other occasions suggest they were making money from the sexual exploitation of children, sometimes their own children. Therefore, it is unlikely that the Australian-based individuals in the current study were sending money to the Philippines-based individuals for reasons other than child exploitation.

Thus, most of the payments the facilitators received from the 256 Australian-based persons were likely for CSA live streaming. Even if a small number of the 2,714 transactions were not for CSA live streaming, we can be confident that overall patterns in the data reflect actual CSA live streaming transactions.

A second limitation of this study is that the transactions analysed here relate to the outcomes from one law enforcement operation in the Philippines that identified a cohort of Australians sending money to known CSA live streaming facilitators. It is unclear to what extent this group is representative of all those in Australia who purchase CSA live streaming services, or whether they are particular to this police operation.

Despite these limitations, this study provides some preliminary insight into an under-researched group and reveals new information about the profile of suspected CSA live streaming viewers, their patterns of transactions and live streaming behaviours.

Results

The matching process identified 256 individuals resident in Australia who had made at least one transaction to a CSA live streaming facilitator in the Philippines. This section examines the demographic profile and transaction history associated with these individuals.

Demographic profile

Given the anonymous nature of the dataset, relatively little demographic information was available on these individuals, which limits the ability to construct a detailed profile. The analysis therefore focused on age, occupation and offending history. Other demographic information, such as gender, was not available.

Age

The ages of the CSA live stream purchasers were initially calculated at the point of data matching (late 2019). The average age of the 210 individuals for whom information was available was 59 years ($SD=11$ years). The youngest CSA live streaming purchaser was 27 years and the oldest 82 years. Sixty-three percent ($n=132$) of CSA live streaming purchasers were aged between 50 and 69 years, compared with 23 percent of the Australian population (Australian Bureau of Statistics 2019). However, this analysis took no account of when the transactions were made and, as will be shown later, many of the transactions were historical (from 2006 to 2018).

Further analysis examined the ages of CSA live streaming purchasers at the time of the transactions. It should be noted that, as the year of transaction and current age were used for this analysis, there is a degree of error (up to two years) in these calculations. The number of transactions made by individuals also influences the results—those making more transactions will be represented more frequently.

Across the 2,557 (94%) transactions for which information was available (age was not available for 157 transactions), the average age at the time of the transaction was 54 years ($SD=9$ years). The youngest age at which an individual made a CSA live stream transaction was 20 years and the oldest was 76 years. Two-thirds (67%, $n=1,703$) of transactions were made by those aged between 50 and 69 years, while 41 percent ($n=1,038$) were made by those aged between 50 and 59 years. In contrast, just 12 percent of the Australian population were aged 50 to 59 years, highlighting the concentrated nature of transactions in this age range. A meta-analysis of 27 studies on (mostly) detected sex offenders found the average ages of online sex offenders (CSAM and grooming offenders) and contact sex offenders were 38.6 years and 43.6 years respectively (Babchishin, Hanson & Hermann 2011). A later examination of 22 studies similarly found the average age of CSAM offenders was 35 to 45 years (Brown and Bricknell 2018).

The average age of purchasers at the time of their first payment to the known CSA live streaming facilitator was 52 years. Sixty percent ($n=126$) made their first payment to the facilitators when they were aged between 40 and 59 years, while 59 percent ($n=123$) made their first transaction between 50 and 69. While for some purchasers this may represent the age of their first CSA live stream viewing, it is possible the purchasers had already paid other facilitators not known to police prior to these transactions.

Occupation

Information on occupation was available for only 39 (15%) of the 256 individuals. While this information cannot be considered representative of the group as a whole, it highlights the wide range of backgrounds from which CSA live stream purchasers came. Stated occupations included, among others, aged care worker, boilermaker, carpenter, chef, computer technician, driller, driver, gardener, mower, rigger, road freight transporter, sales assistant and tradesperson. Others described their occupation as accountant, architect, clerk, general manager, quality technician and self-employed. One described her occupation as housewife.

Offence history

Because the data were matched against the NPRS, it was possible to examine the entire officially recorded offence history of the suspected CSA live stream purchasers. More detailed analysis of offending histories will be provided in subsequent papers, with only a summary provided here.

Overall, 10 percent ($n=26$) of CSA live stream purchasers had at least one sexual offence (defined as aggravated sexual assault, non-aggravated sexual assault, non-assaultive sexual offences against a child, child sexual abuse material offences, sexual servitude offences, non-assaultive sexual offences, or sexual assault not defined) recorded in their criminal history. Seven percent ($n=17$) had a sexual offence against a child in their criminal history, while a further six percent ($n=14$) had a sexual offence against an adult (or a sex offence where victim information was not available) in their history (see Table 1). Five individuals (2%) had records of sexual offences against both children and adults.

Over half (55%) had no recorded criminal history, indicating that many of those engaged in purchasing CSA live streaming services were unknown to law enforcement authorities in Australia.

Table 1: Offence history of suspected CSA live stream purchasers ($n=256$)

	Number	Percent
Sexual offence against a child	17	6.6
Sexual offence against an adult/unspecified victim ^a	14	5.5
Other offence	114	44.5
No offence history	141	55.1

a: Includes sexual offences where victim information (adult or child) was unknown

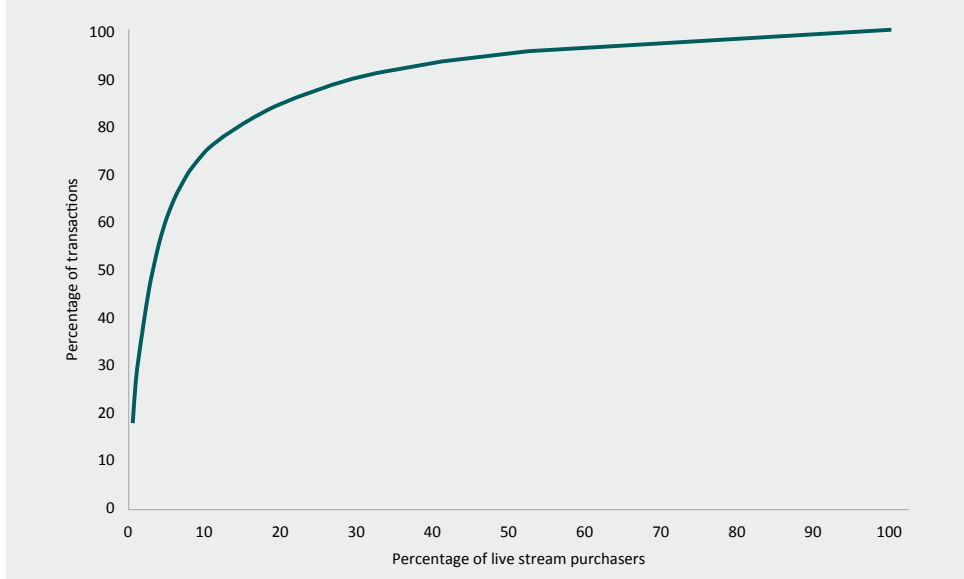
Note: Percentages total more than 100% as individuals can appear in more than one category

Source: Philippines CSA live stream financial transaction dataset

Financial transactions for live streaming of child sexual abuse

Data provided by AUSTRAC were examined for patterns in the financial transactions made by CSA live streaming purchasers. The AUSTRAC data reveal the 256 individuals who sent money to CSA live streaming facilitators in the Philippines had made a total of 8,994 overseas financial transactions (for any purpose). Of these, 2,714 (30%) involved sending money to known CSA live streaming facilitators in the Philippines and form the focus of this chapter. As indicated in Figure 2, many of these transactions were made by a small number of individuals. Just eight individual CSA live streaming purchasers (3%) made 50 percent ($n=1,365$) of all transactions to known CSA live stream facilitators in the Philippines. Even within this group there was a skewed distribution, with a small proportion making a large number of transactions. Among these eight individuals, the number of transactions per person ranged from 77 to 479.

At the other end of the spectrum, 25 percent ($n=64$) of purchasers accounted for less than three percent of transactions. Indeed, almost half (48%, $n=122$) of CSA live stream purchasers made only one transaction involving the known facilitators.

Figure 2: Cumulative frequency of transactions per CSA live stream purchaser

Source: Philippines CSA live stream financial transaction dataset

There was a moderate, statistically significant relationship between offending history and the number of transactions made. CSA live streaming purchasers with a history of sex offending (against either children or adults) were significantly more likely to have made more than one financial transaction (69%, $n=18$), compared with either those with a history of other types of offending (62%, $n=55$), or those with no criminal history (43%, $n=61$) ($\chi^2=10.82$ (2), $p<0.01$, $V=0.21$). Other associations between variables were not statistically significant.

Value of transactions

The total value of the 2,714 payments made to live streaming facilitators was \$1.32m, averaging \$488 per transaction (noting that all values are expressed in Australian dollars). However, the average was skewed by a small number of very large transactions, with 193 (7%) valued at \$1,000 or more each. The median value of all transactions was \$78. Indeed, a quarter (25%, $n=679$) of transactions were valued at \$36 or less, while three-quarters ($n=2,036$) were worth \$170 or less.

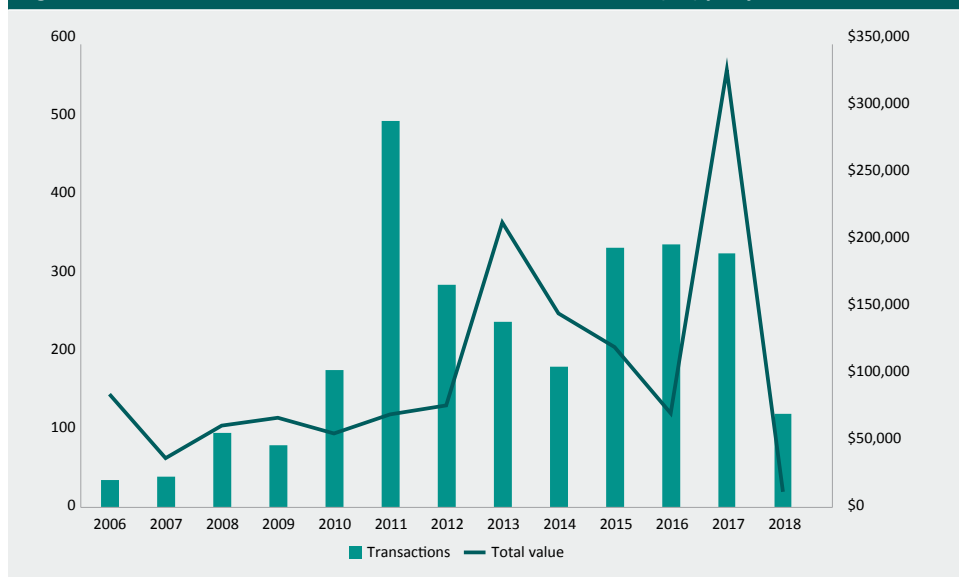
When analysed by individual rather than by transaction, the median value each person sent in total (for all transactions they made) was \$100. Twenty-five percent of individuals ($n=64$) sent \$49 or less, while a further 25 percent ($n=65$) sent \$390 or more. There was no significant difference in the average amounts sent by sex offenders, other offenders and non-offenders ($F=0.66$ (2), $p>0.05$).

Change over time

The payments examined in this study were made to the known CSA live streaming facilitators over 13 years, from 2006 to 2018. Four transactions were recorded in 2019, but were excluded from this analysis as enforcement action against the known facilitators in the Philippines occurred in 2018, thus affecting the availability of CSA live streaming transactions in 2019.

There were large variations in the number and value of payments made over time. As shown in Figure 3, the number of transactions per year peaked in 2011, when 490 payments were made by 70 individuals to the CSA live streaming facilitators. There was a general upward trend in the total value of amounts being sent to the facilitators, peaking in 2017, when over \$323,000 was sent by 20 individuals. However, this is skewed by one individual who sent over \$292,000. The average value per transaction for the remaining 19 individuals was \$106.

Figure 3: Number of transactions and total value of transactions (A\$) per year



Source: Philippines CSA live stream financial transaction dataset

Escalation of offending

There is clear evidence of escalation in the frequency and potential severity of offending in the financial transactions made to CSA live stream facilitators. Further analysis examined the number of days between subsequent transactions among those who made more than one transaction. Of the 256 individuals making a financial transaction, 134 made a second transaction, declining to just 12 who made over 50 transactions. These 12 individuals made between 55 and 479 separate transactions each. Only their first 50 transactions are included in this analysis.

Figure 4 shows that the average time between transactions decreased as the number of transactions increased. While the average number of days between the first and tenth transactions was 44 days, the average number of days between transactions 41 and 50 was 17 days. This suggests escalation in the frequency with which individuals purchased CSA live streaming services as they viewed more content.

Figure 4 also shows the trend in the value of transactions made, by the number of transactions. As individuals purchased more CSA live streaming services, the median amount they paid for those services increased. The median was used for this calculation due to outliers in the amounts of money sent that heavily skewed the average. The median cost of the first 10 transactions made was \$60. This rose to \$120 for transactions 41 to 50. This suggests an escalation in the cost of the typical CSA live streaming event as individuals made more transactions.

It was beyond the scope of this study to determine what the escalation in purchase price reflected. However, it is possible offenders were paying for live streaming sessions that involved more serious sexual abuse (eg penetration as opposed to viewing a child nude) or younger or more victims.

There was a moderate, statistically significant correlation between the value of transactions and the number of days between transactions ($r=-0.43$, $p<0.01$), suggesting that the cost of a CSA live streaming event increased as the time between events declined. It should be noted that this analysis was conducted on the entire sample, which had widely varying transaction histories. For example, while the majority (70%) of transaction histories were under one year, one extended to 12 years. To account for the impact of these differences, the analysis was repeated for the first 365 days of transaction histories for each individual, in order to provide comparable measurement. Broadly similar results were found, although the strength of the relationship between the value of transactions and the time between transactions was slightly weaker ($r=-0.39$, $p<0.01$).

Figure 4: Mean number of days between CSA live stream transactions and median value of first 50 financial transactions



Source: Philippines CSA live stream financial transaction dataset

Discussion

To our knowledge, this is the first study of CSA live streaming to combine financial transactions data and criminal history information to produce a detailed picture of the Australians purchasing such services and their patterns in doing so.

Regarding the demographic profile of those suspected of purchasing CSA live streaming services, only limited information was available in the records provided. However, the analysis revealed some insights not previously available. Where age was concerned, two-thirds of these individuals were found to be in their 50s or 60s. This is older than the ages of those found to view online child sexual abuse material and commit sexual offences generally. An examination of 22 studies found the average age of CSAM offenders was 35 to 45 years (Brown & Bricknell 2018) and a meta-analysis of 27 studies found the average ages of online sex offenders and contact sex offenders were 38.6 and 43.6 years respectively (Babchishin, Hanson & Hermann 2011). While this may be a function of the source of data for the current study, it may also indicate that CSA live streaming offenders are older than other CSAM offenders. This could have implications for preventive interventions (such as messaging campaigns), which may require different approaches to those targeted towards younger cohorts.

Where offending history is concerned, just 10 percent of these individuals had a history of sexual offending, with seven percent having previously committed a sexual offence against a child. However, these findings are within the range of what might be expected for online CSAM offenders in general. For example, a meta-analysis examining the results from multiple criminal record based studies found that one in eight (12%) CSAM offenders had committed a previous contact sexual offence (Seto, Hanson & Babchishin 2011). The prevalence of previous child sexual offending found in this study (including both contact and online offending) would be an under-estimate of the actual level of sexual offending, due to reliance on criminal justice measures. Indeed, self-reported prior contact sexual offending by CSAM offenders has been estimated to range from 51 percent to 60 percent (Seto, Hanson & Babchishin 2011). That may partly explain the high proportion of CSA live stream offenders with no criminal history, but it may also be a function of the difficulty of prosecuting such offences (ECPAT International 2018).

Analysis revealed that the majority of transactions were made by a very small number of individuals. This suggests that law enforcement activity concentrated on these individuals could have a major impact on access to CSA live streaming.

The fact that a large number of individuals made only one transaction is important, although the reason is unclear. Potential explanations might include that CSA live streaming facilitators were scamming individuals into sending money without providing any service in return, that purchasers moved to other facilitators not detected in the Philippines police operation, or that viewing CSA live stream content was not repeated by these offenders. Reasons for the last point may be that individuals were not satisfied with what they saw, either because it was too extreme or not extreme enough. This aspect deserves further research to understand what prevents a first-time offender from becoming a repeat offender, and to determine what individuals seek from CSA live streaming services. The preponderance of one-time suspects also limits the specific deterrent effects of law enforcement action, as a proportion of these individuals might not present a risk of reoffending anyway.

The present study did, however, provide some evidence of escalation in the frequency of and amounts paid for live CSA streaming. For those who made more than one transaction, as more transactions were made, the time between transactions declined and the value of the transactions increased. This could indicate both the increasing frequency of offending and, if monetary value is equated with seriousness, the increasing severity of offending. Escalation in online child sexual abuse has been identified by other researchers. For example, in their sample of child sexual abuse material offenders, Quayle and Taylor (2002) found that the majority escalated to viewing increasingly extreme forms of CSAM. However, to our knowledge, this is the first attempt to quantify escalation over time among CSA live streaming offenders in Australia.

Conclusion

This preliminary study provides some insight into the nature and extent of CSA live streaming behaviour among a cohort of Australians procuring such services from known CSA live streaming facilitators in the Philippines. While there are important caveats to the findings, they provide useful insights for responding to the problem. Many of those who purchase CSA live streaming sessions do so only once (unlike the small cohort of prolific offenders) and the majority have no recorded sexual offending history (similar to other sex offenders and CSAM offenders). With this in mind, and given that CSA live streaming escalates in frequency and severity over time, it is important to apply policies that are appropriate to the specific groups of individuals involved. Approaches that target specific offender traits and behaviours are likely to be more effective in reducing offending than general responses that target all those who participate in CSA live streaming in the same way. Law enforcement and policy bodies could make use of this information to allocate scarce resources more effectively to respond to those individuals most at risk of engaging in CSA live streaming.

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9. Enhancing evidence-based treatment of child sexual abuse material offenders: The development of the CEM-COPE Program

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Introduction

Global access to the internet has facilitated the increased accessing, distribution and production of child sexual abuse material (CSAM, also known as child exploitation material, or CEM). Consequently, the number of individuals detected for CSAM offences has increased in recent years (Australian Centre to Counter Child Exploitation nd; Victoria Police 2014). CSAM is a significant societal problem that causes and perpetuates long-lasting harm to victims, who are both directly sexually abused and repeatedly revictimised through the ongoing distribution and accessing of CSAM long after the abuse occurs (Gewirtz-Meydan et al. 2018). As such, there is a clear need to prevent CSAM-related offences, with the availability of primary, secondary and tertiary level prevention interventions increasing in recent years (see Perkins et al. 2018).

Until recently, psychological treatment approaches for CSAM offenders were largely informed by theories and frameworks relating to 'offline' sexual offenders (Seto 2013). Increased research attention over the past decade, however, has led to a greater understanding of the distinct psychological and offending characteristics of CSAM offenders without a history of contact offending (CSAM-only offenders) as compared to offline child sexual offenders (contact offenders) or offenders who engage in both CSAM and contact sexual offences (dual offenders). This, in turn, has provided a more nuanced understanding of both the risks posed by and treatment needs of CSAM-only offenders, and the associated shortfalls of attempts to address CSAM offending within existing sexual offender treatment frameworks. Increasingly, the research base indicates that traditional programs are unlikely to align with risk–need–responsivity (RNR) principles (Bonta & Andrews 2017), and that specialised treatment approaches are warranted to best address the criminogenic needs of CSAM offenders.

This chapter introduces and describes the development of the Victorian CEM-COPE (Coping with Child Exploitation Material Use) Program (Henshaw et al. 2019), an evidence-based, specialised treatment program for CSAM-only offenders. To contextualise the development of the program, an overview of the research on CSAM-only offender characteristics and recidivism rates is provided. The implications for treatment practices among CSAM-only offenders are discussed before outlining the specific rationale, objectives and specifications of the CEM-COPE Program. Finally, ongoing challenges and areas for future research into CSAM offender treatment are considered.

Defining characteristics of CSAM-only offenders

The growing comparative research base on CSAM offenders has increasingly demonstrated that CSAM-only offenders differ from both contact offenders and dual offenders across several demographic, psychological and offending characteristics. Specifically, meta-analytic (Babchishin, Hanson & VanZuylen 2015) and other comparative studies (Henshaw, Ogloff & Clough 2018, 2017) indicate that, in comparison to contact offenders, CSAM-only offenders are less likely to have:

- histories of physical and sexual childhood abuse;
- severe mental illness or substance use problems;
- early conduct problems, adult criminality, and general impulsivity;
- cognitive distortions and victim empathy deficits; and
- direct access to children (ie in the 'offline' world).

In contrast, CSAM-only offenders are more likely to:

- be young, white, highly educated and employed;
- have difficulties with intimate relationships, sexual intimacy, self-esteem and assertiveness;
- have paedophilic and hebephilic sexual interests;
- have sexual regulation and preoccupation difficulties (eg higher rates of masturbation, pornography use, and use of sex as a coping mechanism); and
- have problematic patterns of general internet use.

Based on the findings of their meta-analysis of 30 comparative studies, Babchishin, Hanson and VanZuylen (2015) concluded that CSAM-only, dual and contact-only offenders could be distinguished based on three key factors: antisociality, sexual deviance and opportunity for offending. While dual and contact offenders demonstrated higher levels of antisociality and opportunity for offending than CSAM-only offenders, CSAM-only and dual offenders were distinguished from contact offenders by their higher levels of sexual deviance as well as demographic characteristics associated with internet access (eg younger age, white, higher education levels, white-collar employment). Evidence of key differences among these groups suggest that CSAM-only offenders may present with unique pathways to offending, and thus different treatment needs, when compared to contact sexual offenders.

Motivating and facilitating factors related to CSAM offending

Seto's motivation-facilitation model of sexual offending posits that sexual offending occurs in the context of both motivating factors (factors that 'create the intention or desire to sexually offend') and facilitating factors (factors that 'increase the likelihood [of] a sexual offence...given the presence of relevant motivations'; Pullman, Stephens & Seto 2016: 482). Examples of motivational factors include paraphilias, sexual compulsivity, intimacy and social skills deficits, and an absence of appropriate sexual outlets. In contrast, facilitating factors include both trait-based factors, such as offence-supportive attitudes and beliefs, psychopathy and poor self-regulation skills, and situational factors including sexual arousal, negative mood states, intoxication, and access to victims (Pullman, Stephens & Seto 2016).

The defining characteristics outlined above suggest that while sexual deviance is likely to be a relevant motivating factor for both CSAM and contact offending, antisociality is less likely to be a key facilitating factor for CSAM-only offenders. Instead, CSAM offending may be facilitated by other characteristics of CSAM offenders. For example, the higher rates of sexual and internet regulation problems among CSAM-only offenders indicate that difficulties in regulating both sexual arousal and broader online behaviours may be key offence-facilitating factors among individuals who are motivated to use CSAM.

Additionally, specific interpersonal and psychological deficits (eg difficulties with assertiveness, self-esteem and relationship functioning) may potentially act as motivating and facilitating factors for CSAM offences. Indeed, one early investigation of CSAM offending pathways identified the intimacy deficits and emotion dysregulation pathways being the most commonly endorsed among CSAM offenders (Middleton et al. 2006). More recent qualitative studies have also identified emotion dysregulation and low distress tolerance as common characteristics associated with the onset and continuation of CSAM offending (Surjadi et al. 2010; Winder & Gough 2010). High rates of certain personality pathologies have also been identified among this group (up to 78%; Niveau 2010), with avoidant, dependent, schizoid, and borderline personality disorder or features being the most common (Magaletta et al. 2014; Webb, Craissati & Keen 2007).

Together, these findings indicate that sexual deviance, excessive internet use and deficits in sexual regulation, emotional regulation and perhaps select interpersonal skills (eg assertiveness) may contribute to the commission of CSAM offences. However, further research among non-offending, offending, and repeat offending populations is required to determine the precise nature and strength of the relationship between CSAM-only offender characteristics and the onset and continuation of CSAM offending.

Recidivism among CSAM-only offenders

Another distinguishing feature of CSAM-only offenders relates to their sexual recidivism rates and offending trajectories. Consistent with the low levels of antisociality found among CSAM-only offenders, recent comparative research has demonstrated that CSAM-only offenders are significantly less likely to sexually reoffend than dual offenders. In their examination of 346 North American CSAM offenders, Eke, Helmus and Seto (2019) found that only eight percent of CSAM-only offenders accrued a new sexual charge or conviction over a five-year period, compared to 25 percent of dual offenders. Similar results were obtained in a larger study of 690 CSAM offenders from the United Kingdom, with dual offenders sexually reoffending at 2.5 times the rate of CSAM-only offenders (26% vs 10%) over an average of 13 years (Elliott et al. 2019). This finding holds true across different sexual offence types, with dual offenders having higher recidivism rates than CSAM-only offenders for both CSAM (18% vs 6%; Eke, Helmus & Seto 2019) and contact (9% vs 4%; Elliott et al. 2019) offences. This counters historical concerns regarding the potential for CSAM-only offenders to 'escalate' to contact sexual offending over time, with international evidence showing up to four percent of CSAM-only offenders committing subsequent contact offences (Elliott et al. 2019; Seto, Hanson & Babchishin 2011). Low reconviction rates (0.66%) for contact offences were also recently reported among a small sample of Australian CSAM offenders ($n=152$) followed over an average of 3.5 years (Krone & Smith 2017). Taken together, these findings indicate that the primary risk posed by CSAM-only offenders relates to further CSAM offending rather than contact offending.

Treating CSAM-only offenders

Treatment dosage and needs

The low recidivism rates and unique personal and offending characteristics of CSAM-only offenders raise clear questions about the utility of employing existing treatment programs among this offender population. Given that existing programs were designed to prevent contact offending among offline offenders, these programs may not be appropriate for CSAM-only offenders. Indeed, in a recent examination of established community-based sexual offender programs, Elliott et al. (2019) found that CSAM-only offenders demonstrated little change in most psychological treatment variables (eg offence-supportive attitudes, socio-affective functioning, and impulse control). Also, change in these psychological variables was not associated with subsequent offending rates, highlighting the limited impact of these treatment programs in rehabilitating CSAM-only offenders.

Several implications arise from the available research findings regarding the treatment needs of CSAM-only offenders. In accordance with RNR model, treatment selection and intensity should be proportional to offender risk level and target the criminogenic needs that are directly linked to offending behaviour (Bonta & Andrews 2017). In practice, this typically translates to moderate and high-risk offenders being prioritised for interventions, while treatment is withheld for low-risk offenders. The issues of risk and need are inter-related, with the level of risk being determined based on an assessment of the presence and relevance of various individual risk factors and criminogenic needs. Generally, the greater the number of risk factors and needs identified, the higher the risk and likelihood of recidivism (Craig, Beech & Harkins 2009).

The lower recidivism rates of CSAM-only offenders in comparison to more diverse sexual offenders therefore raise questions about the utility and necessity of providing treatment of any kind to this offender population. Although recidivism rates are low in the available evidence, data are currently limited to official records of detected offenders with fairly short follow-up periods, potentially underestimating true recidivism rates. Moreover, definitions of risk levels can arguably be viewed as relative to specific populations—that is, some CSAM-only offenders are likely at greater risk of reoffending than others, despite low rates overall. Clearly some CSAM-only offenders do reoffend, indicating that appropriately targeted treatment may be of use for at least a small proportion of these offenders. In this context, the risk principle indicates that, if offered, treatment programs for CSAM-only offenders should be of a lower intensity (shorter in duration) than typical sexual offender treatment programs (which frequently comprise between 100 and 300 hours of content; Gannon et al. 2019).

Additionally, the unique characteristics and recidivism patterns of CSAM-only offenders indicate that specialised interventions targeting CSAM-specific risk are likely more effective than existing interventions targeting contact offending. To some extent, however, the development of evidence-based interventions for CSAM-only offenders and CSAM-specific risk has been hindered by the lack of definitive knowledge about the specific treatment needs of this group. Although understanding of the defining characteristics and offending trajectories of CSAM-only offenders has increased, clear and consistent predictors of recidivism are yet to be established among this population. Seto and Eke (2015) examined the predictive power of 44 variables and found that only three significantly predicted recidivism among CSAM-only offenders. Each of these variables related to possessing a higher proportion or number of CSAM/pornographic materials depicting males as opposed to females. None of the other items—demographics, criminal history, substance misuse, access to children, deviant sexual interests, or CSAM offence characteristics—were associated with subsequent offending. This finding could potentially be attributable to the low recidivism base rate (8%) among this sample, which may have limited the power of the analyses to detect significant effects.

In the absence of clear predictive factors for CSAM offending, clinicians and program developers must rely on the broader empirical research base on the characteristics of CSAM-only offenders and the ways in which they differ from other offenders. As outlined above, the available research suggests that interventions focusing on sexual and emotion regulation, internet use and interpersonal skills are likely to be most pertinent to CSAM-only offenders. In contrast, research findings indicate that interventions targeting antisocial attitudes, substance use, general lifestyle instability, and victim empathy are likely to be of less relevance for CSAM-only offenders (Babchishin et al. 2018; Babchishin, Hanson & VanZuylen 2015).

It has long been known that programs that fail to adhere to RNR principles are likely to lead to poorer outcomes (Andrews et al. 1990). Thus, providing lengthy and poorly targeted programs to CSAM-only offenders is not consistent with best-practice principles. At best, this would likely lead to an over-servicing of CSAM-only offenders, representing an ineffective and unnecessary use of criminal justice resources. At worst, it has the potential to increase risk by neglecting key offence-specific needs (eg sexual and internet regulation) or, in the case of over-servicing, reducing opportunity to engage in other pursuits important to general wellbeing and prosocial lifestyle (eg employment, leisure activities, general mental health treatment; Bonta and Andrews 2017).

Emerging treatment approaches

Several CSAM-specific interventions have emerged in the past decade in recognition of the disparity between traditional treatment programs for sexual offenders and the treatment needs of CSAM-only offenders. Available programs are varied with regards to modality, approach and content. For example, individuals can access self-guided support via online programs such as 'Stop it Now' (Lucy Faithfull Foundation 2019) or 'Troubled Desire' (Institute of Sexology and Sexual Medicine 2019), as well as manualised group-based therapeutic interventions (described below; Gillespie et al. 2018; Middleton, Mandeville-Norden & Hayes 2008). Broader preventative treatments and services are also available globally, including specialised treatment programs for non-offending individuals and online, dual and contact sexual offenders. These services use both therapeutic and peer-led initiatives to support individuals potentially at risk of sexually offending (see Perkins et al. 2018).

To date, only two programs specifically targeting CSAM-only offenders have been empirically evaluated. Middleton, Mandeville-Norden and Hayes (2009) evaluated the Internet Sexual Offender Treatment Program (i-SOTP) among a sample of 264 CSAM offenders. The i-SOTP is a group-based intervention in the United Kingdom that comprises 35 two-hour sessions delivered across six modules. The topics of the modules include identifying personal values and building motivation, offence analysis, victim awareness development, emotion regulation and intimacy skill development, addressing compulsivity and sexual deviance, and relapse prevention strategies. Participation in the i-SOTP was associated with significant improvements across measures of pro-offending attitudes, socio-affective functioning (eg self-esteem, assertiveness) and impulsivity and self-management skills. The program was recently revised (and re-titled 'i-Horizon') to more accurately reflect the growing empirical evidence relating to CSAM-only offender treatment needs. It now comprises 46 hours of CSAM-targeted content delivered across both group and individual sessions (Babchishin et al. 2018; Her Majesty's Prison and Probation Service 2018). To our knowledge, the revised program has not yet undergone empirical evaluation.

More recently, Gillespie et al. (2018) evaluated the Inform Plus program. This program is a group-based psychoeducational intervention in the United Kingdom that aims to support individuals to cease CSAM offending. It entails 10 group sessions of 2.5 hours each, covering offence analysis; the role of sexual fantasy in sexual offending; addictions and compulsions; disclosure, social skills and relationships; criminal justice information; victim empathy; lifestyle changes; and future planning (Gillespie et al. 2018). Ninety-two men, most of whom were under investigation by the police for CSAM-related offences and yet to receive a conviction, participated in the program and the associated evaluation. Similar to the i-SOTP program, participants experienced improvements across measures of social competency, emotion regulation skills, empathy, internet-related attitudes, and general mental health following program participation. These improvements were largely maintained 12 weeks after completing the program. Participants also subjectively perceived that they were more able to manage their thoughts, feelings and behaviours related to their CSAM offending following program completion (Dervley et al. 2017).

Taken together, the evaluations of both the i-SOTP and Inform Plus programs provide preliminary support for the need for and effectiveness of CSAM-specific programs. Although neither of these evaluations examined recidivism or reconviction rates, the results suggest that criminogenic needs of CSAM-only offenders can be successfully targeted via community-based group interventions. Given the emerging nature of this evidence and ongoing developments in treatment approaches, further research is required to reveal which components of the treatment are effective for this population. Additionally, given that both empirically evaluated interventions were delivered in the United Kingdom, there is a need for program evaluation in different cultural contexts.

The CEM-COPE Program

At present there are no widely available programs designed specifically for CSAM-only offenders in Australia. Instead, CSAM offenders who receive treatment are either placed in existing treatment programs designed for offline sexual offenders, or given individual treatment delivered on an ad-hoc basis. Where clinicians have a solid understanding of the current literature (including its limitations) and are well informed about the treatment needs of CSAM offenders, individual intervention is likely to be more effective in reducing recidivism than existing sexual offender group treatment programs. However, not all clinicians will possess such understanding or have ready access to emerging empirical literature, thus potentially limiting the effectiveness of interventions delivered individually. As such, there remains a clear need for intervention options for CSAM-only offenders in Australia. This was the impetus for the development of the CEM-COPE (Coping with Child Exploitation Material Use) Program (Henshaw et al. 2019), an empirically-informed group treatment program for CSAM-only offenders. The following sections provide an overview of the program development process and program specifications, as well as a brief description of the associated research pilot project.

Program development process

The CEM-COPE Program builds upon existing CSAM treatment research, programs and evaluation outcomes and targets the likely criminogenic needs of CSAM offenders. It was developed using a two-stage process. First, an extensive review of the literature pertaining to CSAM offender characteristics, risk factors and treatment considerations was conducted. Where available, manuals or outlines of existing specialised treatment programs were also reviewed, along with any associated research evaluation outcomes. We then collated outcomes across specific psychological domains to formulate the likely treatment needs to be addressed by the program.

The second stage comprised the development of a preliminary program outline and program manual based on the outcomes of the review stage. This was aided by collaboration with an expert consortium of leading international and national clinicians and researchers in the fields of CEM offending, sexual offending, and forensic intervention. The consortium included Dr Michael Seto, Dr Angela Eke, and Professor Ethel Quayle (international members) and Dr Karen Owen, Dr Joel Godfredson, and Dr Angela Sorotos (local members). Each consortium member provided feedback on initial versions of the program outline and manual. This feedback was collated and reviewed by the primary development team, before being integrated into the revised program outline and manual to form the CEM-COPE Program as described in the following section.

Objectives and specifications

The CEM-COPE Program is a 10-session program designed for CSAM-only offenders with no known history of contact sexual offences. In keeping with RNR principles, it aims to assist individuals to understand and manage their risk by providing low-intensity psycho-education and skills-based intervention in areas empirically related to CSAM offending or recidivism. Beyond the core RNR principles, the program also emphasises and promotes participants' strengths, growth, wellbeing and personal safety. As such, an integrated goal of the CEM-COPE Program is to empower individuals to harness and further develop their strengths and skills so that they may live balanced, meaningful lives, free of offending.

The overarching objective of the program is to reduce the risk of future CSAM offending by supporting group members to:

- understand why and how they offended to identify avenues for intervention and skill development;
- build and reinforce psychological skills to support desistance; and
- develop self-management plans based on what they learnt throughout the program, including the identification of any ongoing offence-specific or broader psychological treatment needs.

The CEM-COPE Program's 10 two-hour sessions are delivered weekly, in a closed group format, with each session building upon the previous sessions and associated homework tasks. Session topics and content include:

- group establishment, motivation, and goal setting;
- legal issues and offence formulation;
- emotional awareness and regulation skills;
- problematic internet use and sexual regulation skills;
- relationship and communication skills; and
- self-management and relapse-prevention planning.

Homework tasks typically consist of reflective exercises or experiential skills practice to support the development of both insight and risk-relevant psychological skills. The program draws on concepts and techniques from a range of evidence-based psychological treatment modalities, including acceptance and commitment therapy, cognitive behavioural therapy, and dialectical behavioural therapy.

Target population: Inclusion and exclusion criteria

The CEM-COPE Program is designed specifically for individuals with a history of accessing, possessing and distributing CSAM. Individuals with a history of CSAM production may also participate in the CEM-COPE Program if their offending is limited to the creation of material in the absence of a direct victim (eg altering images of children to make them sexual, or writing erotic material featuring children).

Conversely, the program is not intended for individuals with a history of more diverse sexual offending, including contact offending; CSAM production involving the direct abuse of an identifiable victim (eg filming one's own abuse of a child or filming sexual interactions with children via webcam); or sexual solicitation offences (eg using the internet to solicit CSAM from children or engage in sexual chat with children online). These individuals are excluded as they may require more intensive offence-specific intervention targeting more extensive and diverse needs.

The program is also not recommended for individuals with active severe mental health conditions (eg schizophrenia or bipolar disorder), enduring cognitive impairments (eg intellectual disability or acquired brain injury), or acute and high-risk suicidal or self-harming behaviours. Such conditions would likely impede the progress of both the individual and the broader group and would require a more targeted and individualised approach to support progress.

Pilot project

The CEM-COPE Program is currently being piloted through the Problem Behaviour Program of the Victorian Institute of Forensic Mental Health (Forensicare) in Melbourne, Australia. The overarching aim of the pilot project is to obtain feedback from group members and facilitators regarding the clinical utility, efficacy and feasibility of the CEM-COPE Program. This will be primarily achieved through qualitative analysis of focus group interview data and basic descriptive analysis of survey-based feedback data. Pre- and post-treatment scores on several self-report questionnaires will also be compared to provide a preliminary assessment of the program's ability to reduce offence-specific deficits (eg compulsive internet use, emotion and sexual regulation difficulties).

One round of the CEM-COPE Program has been delivered thus far. Although sufficient data are not yet available for analysis, participant engagement has been good and feedback on the program has been positive to date, with practical considerations offered regarding program pace, length and format. Ongoing data collection will allow for formal data analysis and further refinement of the CEM-COPE Program, with the view to undertaking more extensive and robust evaluation among larger samples of CSAM-only offenders in future.

Challenges and future directions

Which CSAM offenders need treatment?

While empirical knowledge of CSAM offender characteristics and risks has steadily increased over the past two decades, important questions remain about effective clinical and legal practices among this population. The available evidence on the offending trajectories of CSAM-only offenders suggests that offenders tend to fall within one of three treatment-related groups:

- offenders who are unlikely to sexually reoffend and thus require no treatment (at least 75% and perhaps up to 95% of offenders);
- offenders who are at risk of further CSAM offences and require specialised interventions (most of the remaining offenders); and
- offenders who are at risk of contact offending and may need more intensive intervention that mirrors existing programs for contact offenders (a very small minority).

The difficulty, however, lies in identifying the offenders who should be prioritised for treatment in the absence of clear predictors of recidivism or formal risk assessment practices. Although the available research suggests that existing risk assessment tools are likely appropriate for use with dual offenders, the different characteristics and recidivism patterns suggest that they should be used cautiously, if at all, with CSAM-only offenders (Henshaw, Darjee & Clough 2020). While some risk assessment tools specifically for CSAM offenders have recently been developed (eg the Child Pornography Offender Risk Tool; Eke, Helmus & Seto 2019; Seto & Eke 2015), they are yet to be extensively validated among diverse samples of CSAM offenders or established as consistently effective for CSAM-only offenders, potentially due to low recidivism base rates.

A related issue is the likely under-representation of CSAM offending within existing recidivism studies, which to date have been based on official offending records. Although under-reporting is a problem for most sexual offences (see Gelb 2007), this poses particular challenges for CSAM offender risk assessment given the difficulties of accurately predicting rare events (Seto & Eke 2015). Because of the expansive, unregulated and pseudo-anonymous nature of the internet, there are likely to be many more offenders than are detected by authorities. Online reports related to online child sexual exploitation vastly outnumber the offenders sentenced in recent years (see Australian Centre to Counter Child Exploitation nd; County Court of Victoria 2017; Magistrates Court of Victoria 2017). Establishing recidivism rates based on self-report information is also challenging, given the mandatory reporting requirements for both online and contact sexual offences in many jurisdictions, including Victoria (s 327 *Crimes Act 1958*).

The inability to accurately identify the CSAM offenders who are most at risk of subsequent reoffending means that interventions are unlikely to be accurately targeted towards those with the greatest need. This may also result in the over-servicing of many low-risk CSAM-only offenders who do not require any form of treatment, even if specialised programs are available. In addition, this has the potential to obscure the outcomes of program evaluations, given that treatment samples may include offenders who are unlikely to reoffend whether or not they participate in interventions. Thus, evidence-based practice for treatment of CSAM-only offenders will remain imprecise until our understanding of the predictors of CSAM offending is improved and clearer guidelines for risk assessment are developed.

Directions for future research and program development

Given the challenges outlined above, there is a clear need for ongoing research to clarify the degree of risk posed by CSAM-only offenders and the relationship between psychological and offending characteristics and later offending (or desistance) among this group. In particular, studies that seek to establish and replicate predictive relationships between offender or offence characteristics and the trajectories of CSAM-only offenders would be beneficial in enhancing both risk assessment and treatment practices. Moreover, further evaluation and validation of both existing and emerging risk assessment tools is required to develop robust, evidence-based risk assessment practices among the broader CSAM offender population. Given the low base rates of reoffending in official records, future research would ideally be conducted among large representative samples over lengthy follow-up periods, with collaboration and data linkage occurring across jurisdictions.

In addition, evidence-based treatment practices would be enhanced by the ongoing evaluation and validation of emerging specialised treatment approaches. These evaluations should examine both changes in characteristics related to offending risk and recidivism outcomes throughout and following treatment. Repeated follow-up over longer periods would also improve understanding of whether treatment-related changes are long-lasting, or whether additional 'booster' sessions are required. Ideally, evaluation studies should also include control samples of individuals who receive either no treatment or traditional treatment approaches to ensure that any significant effects can be attributed to the specific programs being evaluated. Finally, it would also be beneficial to compare outcomes across existing specialised programs to determine whether programs with particular formats, specifications or theoretical approaches lead to positive and long-lasting clinical and behavioural change.

Regarding the CEM-COPE Program specifically, it is expected that the outcomes of the current pilot study will allow for further refinement of the program ahead of more formal and rigorous evaluation of its effectiveness in reducing CSAM-related risk. Assuming that such endeavours provide evidence of effectiveness, it is hoped that the program will be made available for use within both correctional and forensic mental health services nationally. Alternative versions of the program could also potentially be developed to target various subgroups of CSAM offenders (eg offenders with autism spectrum disorder or intellectual disability) if further empirical information indicates that this is warranted.

Conclusion

The substantial increase in the number of individuals accessing, distributing and producing CSAM in recent decades has led to increased interest in the intervention needs of CSAM-only offenders. Evidence of the distinct characteristics and recidivism patterns of CSAM-only offenders indicates that traditional programs are unlikely to be suitable, and that specialised intervention is warranted. While specialised programs are emerging internationally, both accessibility and evaluation remain limited. In particular, there are limited options for interventions that address CSAM-specific risk in Australia. As such, many local CSAM-only offenders are likely to receive inappropriate treatment.

The newly developed CEM-COPE Program is an important development in local evidence-based practice for the management of CSAM-only offenders. Although further development and evaluation is required prior to widespread implementation, it is anticipated that the CEM-COPE Program and associated research will assist in preventing CSAM offending and inform future practice for the management of CSAM-only offenders. Broader research into the risk posed by CSAM offenders and the effectiveness of existing and emerging specialised programs is also required to inform best practice internationally. In particular, research that aims to identify and clarify risk factors and risk assessment practices for CSAM offenders is crucial to ensure that interventions are appropriately targeted towards higher risk offenders and that more robust treatment evaluations can be undertaken. Such research would lead to enhanced therapeutic responses to CSAM offending that promote desistance from offending, offender wellbeing and, ultimately, the safety of children internationally.

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Transnational serious and organised crime

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10. Recruitment into organised criminal groups: A systematic review

Francesco Calderoni, Gian Maria Campedelli, Tommaso Comunale, Martina E Marchesi and Ernesto U Savona

While several disciplines have produced a rich and growing literature on the general impact of organised crime (criminology, sociology, history, law, political science, economics and psychology), there is little systematic assessment of the factors determining individuals' recruitment into organised criminal groups. Knowledge of the processes leading to recruitment into organised criminal groups is scattered across different fields and is rarely the main objective of specific research effort. This may be an obstacle to a better understanding of the social and organisational characteristics of criminal organisations. Furthermore, the unsystematic nature of this knowledge jeopardises the development of preventive programs aiming to effectively reduce recruitment into criminal organisations and, in turn, their capacity to maintain themselves over time.

This report provides a narrative synthesis of the results of a systematic review of the social, psychological and economic factors leading to recruitment into organised crime (Savona, Calderoni, Superchi et al. 2017). The report summarised here analysed the evidence in the literature published in or before 2017. The study was an output of Project PROTON (Modelling the PRocesses leading to Organised crime and TerrOrist Networks, <https://www.protonproject.eu>), a research project funded by the European Commission under the Horizon 2020 program which aims to develop simulations of recruitment (grant no. 699824).

Background and objectives

Recruitment into an organised criminal group (alternatively referred to as joining) may entail significant consequences for the lives of individuals. Joining a criminal organisation often increases the risk of offending, arrest and conviction (Melde and Esbensen 2014; Savona, Calderoni, Campedelli et al. 2017). Furthermore, it may increase the risk of other negative consequences for the individual, such as individual injury, educational and employment failure, and social isolation. Recruitment into organised criminal groups is thus a negative turning point, likely to entrench individuals into a spiral of prolonged and increasingly serious offending which significantly and negatively impacts on their future existence (Laub and Sampson 1993; Melde and Esbensen 2011).

Despite the serious individual and societal consequences of joining organised criminal groups, the available evidence on the various factors leading to individuals' recruitment is scarce. A common definition of both organised crime and recruitment are missing, and studies use multiple theoretical and methodological approaches. The lack of evidence is surprising given the growth in organised crime research and the investments made in specialised law enforcement agencies, investigative techniques, and international cooperation. The mismatch between empirical evidence on recruitment into organised criminal groups and the variety of policy measures tackling it may hinder the evaluation of these measures and the development of effective policies.

Whereas there is no systematic assessment on recruitment into organised criminal groups, evidence from other areas of the literature may provide some interesting insights. For example, while organised crime and gang research have traditionally evolved in parallel, they also share several elements, such as the negative consequences of joining a gang, the use of violence, group processes and identities, and involvement in illicit markets (Decker, Bynum and Weisel 1998; Decker and Curry 2002; Decker and Pyrooz 2015). Research on gangs has an established tradition of assessing what drives individuals to join youth gangs and the effectiveness of policies to prevent gang involvement.

The substantial body of systematic reviews on gangs, however, has mostly focused on youth street gangs. For example, Klein and Maxson (1990: ch 4) systematically assessed the factors associated with joining adolescent gangs in a selection of 20 studies from 1990. They found several factors across five domains (individual, family, peer, school and neighbourhood) that increased the probability of joining a gang, although stronger support was found for factors falling into the peer, individual and family domains. Raby and Jones (2016) identified 102 studies on the risk factors for male youth gang affiliation and found various levels of support for different individual, family, peer and environmental factors.

More recently, Mallion and Wood (2018) focused on the relationship between emotional processes and youth gang membership, finding that high levels of antisocial personality disorder as well as low empathy and emotional intelligence were potential risks for gang membership. Higginson and colleagues (2018) examined the predictors of gang membership in low- and middle-income countries. Also, Tonks and Stephenson (2019) systematically assessed the process of disengagement from street gangs. In addition to the systematic assessment of risk factors, several other systematic reviews have addressed the impact of specific interventions on gang involvement (Fisher, Montgomery and Gardner 2008; Higginson et al. 2015; Hodgkinson et al. 2009).

The discrepancy between the availability of systematic assessments of the factors leading to involvement in youth street gangs and organised criminal groups enables a few considerations. First, while the design and implementation of gang policies can rely on a strong body of evaluation research, policies on organised crime lack such an evidence base and may be scarcely effective, inefficient or even counterproductive. Considering the financial and resource costs of the many national and international institutions fighting organised criminal groups, the improvement of available knowledge on organised crime is essential for ensuring better and more effective policies. Second, the lack of systematic assessments of organised crime may be due to the controversial nature of and diverse forms taken by organised crime, but also the inevitable methodological difficulties in studying an often secret, hidden population engaged in serious, violent offending. Third, the growth in the number and quality of systematic reviews on gangs may offer some reasons to be optimistic. As this report will show, the number and quality of studies on recruitment into organised criminal groups are growing. In the next decades, however, more and better studies will likely enable comprehensive assessment of the available evidence on organised crime and systematic evaluations of the effectiveness of policies deployed to prevent and tackle criminal organisations.

Method

The current study aimed to systematically assess the factors associated with recruitment into organised criminal groups in the existing literature. The review adopted an operational definition based on the United Nations Convention on Transnational Organized Crime (United Nations 2000), which at Article 2 defines an ‘organized criminal group’ as a ‘structured group of three or more persons, existing for a period of time and acting in concert with the aim of committing one or more serious crimes...in order to obtain, directly or indirectly, a financial or other material benefit’. The UN definition has been criticised for its excessive breadth (Paoli and Fijnaut 2004; Schloenhardt 2010). Nevertheless, this broad definition ensured that the systematic review encompassed different types of groups, ranging from mafias to gangs and drug trafficking organisations. At the same time, the systematic review excludes youth gangs (defined in accordance with the Eurogang definition as ‘any durable, street-oriented youth group whose identity includes involvement in illegal activity’; Weerman et al. 2009: 20) given that organised criminal groups are normally considered adult phenomena and to avoid overlap with the already mentioned systematic reviews on youth street gangs.

Recruitment into organised criminal groups has received scarce attention in the literature and there is a lack of a commonly agreed definition. For the purpose of this systematic review, recruitment refers to the different processes leading individuals to a stable involvement in an organised criminal group. The definition encompasses a variety of situations, ranging from formal affiliation rituals to the informal socialisation into criminal groups through friends or family. However, it excludes occasional participation in offences with members of a criminal group. In this document we alternatively refer to recruitment as joining without intention to differentiate between these terms (for a similar terminological choice, see Decker & Chapman 2008: 96).

This systematic review included both quantitative and qualitative studies. Qualitative studies were included due to the aim of systematically scanning all the available evidence on the factors leading to recruitment into organised criminal groups. This field of research is affected by the limited availability of datasets, and the difficulties in collecting data on criminal organisations in general due to their secrecy and the potential dangers. Consequently, the literature on organised crime largely consists of qualitative studies relying on, for example, participant observation, interviews and case studies.

The research team has also undertaken the process of a Campbell systematic review, which follows the detailed guidelines and standards established by the Campbell Collaboration, a non-profit organisation promoting evidence-based policy in several fields including crime and justice (<https://www.campbellcollaboration.org/>). Presently, the title of the systematic review (Calderoni et al. 2017) and the protocol (Calderoni et al. 2019) have been approved and published and the review itself is ongoing. The systematic review conducted according to the Campbell Collaboration guidelines will mostly focus on quantitative studies with the aim of synthesising available evidence on the strength of specific factors for recruitment, leading to a meta-analysis of the results.

Search strategy

The systematic review examined academic and grey literature in English, French, German, Italian and Spanish with no temporal or geographic limitations. The search strategy aimed to retrieve empirical studies examining the social, psychological and economic factors associated with recruitment into organised criminal groups. The query structure combined multiple keywords from three categories:

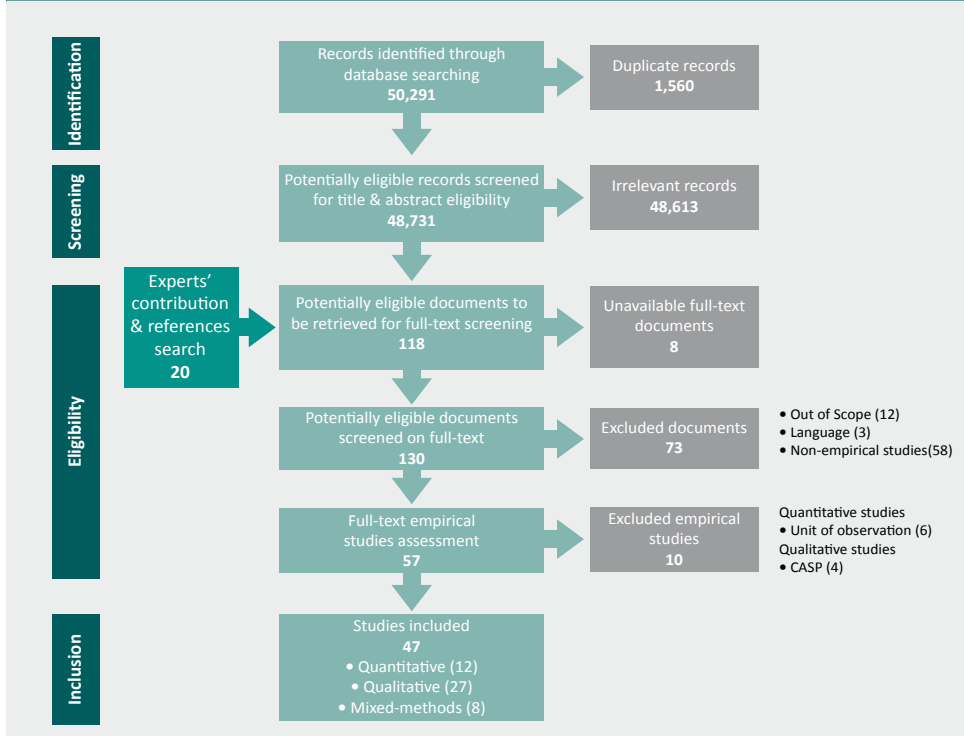
- type of organised crime group (eg “criminal organisation”, “crim* network*”, “motorcycle gang*”);
- type of factors (eg “povert*”, “econom*”, “behavioural”); and
- recruitment (“predictor*”, “factor*”, “correlat*”).

A team of trained researchers conducted the search on 12 databases between February and April 2017.

Screening of documents

The initial search yielded 48,731 unique studies, whose titles and abstracts were subsequently screened to exclude irrelevant studies. The screening resulted in 118 documents eligible for full-text assessment. This list was further expanded by examining the bibliographies of these studies and through interaction with organised crime scholars. A total of 138 potentially eligible documents were assessed in the full-text screening. Out of 138 studies, eight were unavailable in full-text, and 73 documents were excluded because they were non-empirical studies, out of scope, or in a language not included in the review. Of the remaining 57 empirical studies, 10 were excluded because they did not focus on factors at the individual level or did not describe the methodology or results in sufficient detail. In conclusion, the systematic search of the literature yielded 47 empirical studies assessing the factors leading to recruitment into organised crime (Figure 1).

Figure 1: Screening process



Source: Savona, Calderoni, Superchi et al. 2017: 19

Limitations

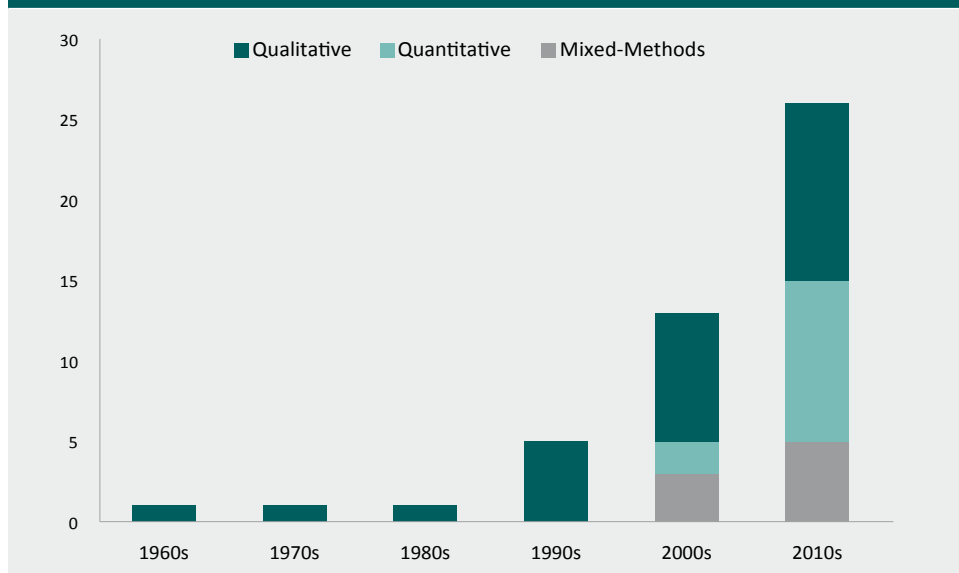
It should be noted that the selected studies rarely provided enough information to accurately establish causal or temporal relationships between certain factors and recruitment into organised criminal groups. The standard approach in systematic reviews on risk factors for crime requires that risk factors precede the event/condition in question (eg substance use disorder during youth and offences during adulthood). Applying this requirement would have excluded many of the 47 studies reviewed, substantially restricting the scope of this systematic review to factors such as gender, place of birth, and parental or other family factors whose occurrence may safely be assumed to predate involvement in organised criminal groups. A more flexible approach enabled a more comprehensive review, but invites particular caution in assessing causal relationships between the factors and recruitment.

Results

Overview of the included studies

The studies included in the systematic review span several decades, the first being published in 1969 and the latest in 2017 (Figure 2). While only three studies were published between the 1960s and the 1980s, the number of publications increased in subsequent decades, with the highest number of works being published in the 2010–2017 period. More than half of the included studies were published since 2010 ($n=26$). Overall, the majority of the studies relied on qualitative methods ($n=27$). Quantitative ($n=12$) or mixed-method ($n=8$) studies have been published only since the 2000s. Nevertheless, the increasing trend in the number of included publications observed in the last decades was largely driven by quantitative studies, which nearly equalled qualitative studies in number during the 2010–2017 period ($n=11$ vs $n=10$, respectively). Tables A1 to A3 list the selected studies.

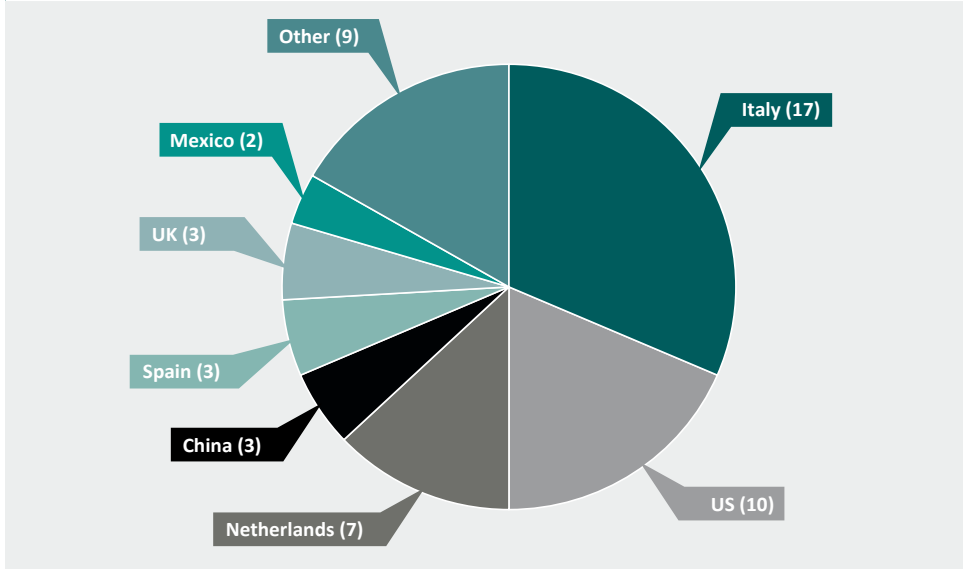
Figure 2: Included studies by decade and research method



Most of the studies ($n=23$) relied on secondary data, examining recruitment into organised criminal groups using official crime data, arrest data, or judicial or police documents. Slightly more than a quarter of the included studies used primary data—mostly interviews and surveys with offenders or informants ($n=13$)—whereas another 11 studies used both primary and secondary data.

The studies included in the review covered 16 countries, although with different frequencies. Considering that some studies covered more than one country, Italy ($n=17$) and the United States ($n=10$) accounted for nearly half of the studies, followed by the Netherlands ($n=7$) (Figure 3).

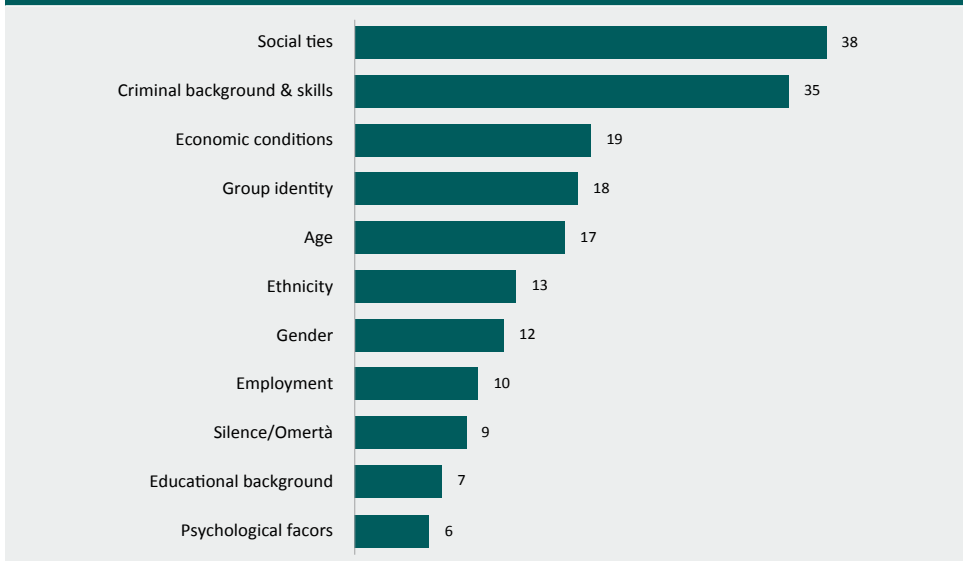
Figure 3: Included studies by country



The factors leading to recruitment into organised criminal groups

All the included studies analysed the factors leading to recruitment into organised criminal groups. The full-text assessment of the selected documents identified a total of 184 factors, which were classified into 11 categories for a better synthesis. The most frequently reported categories were social ties (38 factors identified in the included studies) and criminal background and skills (35 factors identified). The following subsections provide insight into the factors identified within each category in order of declining prevalence. Certain factors which have less relevance to the Australian context, such as silence/omertà, are not examined in detail in this chapter. Further details are available in the full report (Savona, Calderoni, Superchi et al. 2017).

Figure 4: Number of factors by category (n=184)



Social ties

Social ties are the factors most frequently reported as leading to recruitment into organised criminal groups. Social relations comprise parental, family, kinship, friendship and other ties. Social, professional and criminal connections are frequently interrelated and mutually reinforcing, and often create opportunities for 'profitable criminal opportunities' (Kleemans & de Poot 2008: 75).

Family ties are an important driver of recruitment into organised crime groups (Arlacchi 1983; Arsovska 2015; Behan 1996; Brancaccio 2017; Ciconte 1992; Cressey 1969; Decker & Chapman 2008; Gambetta 1993; Giménez-Salinas & Regadera 2016; Giménez-Salinas, Requena & de la Corte 2011; Kissner & Pyrooz 2009; Lo 2010; Requena et al. 2014; Sciarrone 2014; Sergi 2016; van Koppen 2013; Varese 2013, 2011a, 2011b, 2001; Wang 2013). Family ties favour the cultural transmission and learning processes required for recruitment into criminal organisations (Gordon 2000; Sergi 2016). The role of family is particularly strong for traditional groups such as the Italian mafias, where being born in a mafia family often determines an individual's early involvement in the organisation (Albini 1971; Arlacchi 1983; Ciconte 1992; Gambetta 1993; Hess 1973; Lupo 1993; Paoli 2003; Sciarrone 2014; Sergi 2016). However, more recent research shows that the importance of the family extends even beyond the more traditional and family-based criminal organisations. For example, parental gang membership increases the probability that an individual will become a gang member (Kissner & Pyrooz 2009). Similar influences emerged in recent studies on Dutch organised criminals (van Dijk, Kleemans & Eichelsheim 2018; Spapens & Moors 2019).

Beyond family, previous friendships and acquaintances are often conditions for recruitment into organised crime groups. These groups rely on close friendships due to the need for high levels of trust (van Koppen 2013). These ties are often reinforced by common ethnic, regional or neighbourhood origins (Albini 1971; Paoli 2003).

Social ties are also the result of specific educational background, employment and professional expertise. Individuals come into contact with organised criminal groups in their work environment and this generates criminal opportunities which may lead to their recruitment (Kleemans and de Poot 2008; van Koppen 2013; van Koppen and de Poot 2013).

Criminal background and skills

The included studies often identified the importance of violence and criminal expertise to recruitment into organised criminal groups (Albini 1971; Arlacchi 1983; Behan 1996; Blokland et al. 2019; Brancaccio 2017; Gambetta 1993).

Violence and an inclination for criminal behaviour are often crucial for recruitment in organised criminal groups. Members report long, violent and prolific criminal careers, and these patterns often precede their joining the organisation (Behan 1996; Blokland et al. 2019; Kirby et al. 2016; Requena et al. 2014; see also Campedelli et al. 2019). Furthermore, a more active criminal career often involves imprisonment, which can favour the establishment of contacts, social relations and opportunities for recruitment into organised criminal groups (Behan 1996; Ciconte 1992).

Several other skills may prove crucial to recruitment into organised criminal groups. Individuals need to show loyalty, competence in specific illegal business activities, and the capacity to avoid police detection (Densley 2012). Additionally, expertise and qualifications associated with particular education, employment or working conditions may on some occasions promote the recruitment of specific individuals (Gambetta 1993; Giménez-Salinas & Regadera 2016; van Koppen 2013).

A specific skill is the capacity to maintain silence. For the Italian mafias, adherence to the code of silence, or *omertà*, is often an essential requirement for recruitment into the organisation (Albini 1971; Ciconte 1992; Cressey 1969; Gambetta 1993; Hess 1973; Lupo 1993; Paoli 2003). The code of silence encompasses a variety of behavioural and attitudinal elements, including diffidence towards and avoidance of contact with law enforcement agencies, a commitment not to reveal information to outsiders, and a general attitude of denying the existence of the criminal groups.

Educational background, employment and economic conditions

Several studies pointed out that members of criminal groups reported low educational achievements (Albini 1971; Carvalho & Soares 2016; Sales 2015; Savona, Calderoni, Campedelli et al. 2017). Arlacchi (1983) contended that the education levels of Italian mafia members have increased over time, allowing them to exploit new opportunities arising from the growing market economy. However, this increase may have reflected improved education levels in the general Italian population. According to an analysis of the entire population of individuals convicted of mafia association in Italy ($n=13,229$ individuals), 82 percent of the sample had had between five and eight years of education (Savona, Calderoni, Campedelli et al. 2017: 200).

The selected literature also found that a lack of legitimate jobs may promote recruitment into organised criminal groups (Brancaccio 2017; Ciconte 1992; Gambetta 1993; Jhi & Gerber 2015; Sales 2015; Wang 2013). For example, Jhi and Gerber (2015) showed that the probability of becoming a gang member was nearly three times higher for individuals with no employment history before prison than for individuals with work experience before prison.

Some studies suggested that specific work positions or professional skills provide an opportunity to join criminal groups (Ciconte 1992; Kleemans & de Poot 2008; Kleemans & van de Bunt 2008; van Koppen 2013; van Koppen & de Poot 2013). For example, employment in the transport industry gives workers opportunities to move illicit goods, making them attractive recruits for criminal groups (van Koppen & de Poot 2013).

Overall, poor economic conditions and low socio-economic status were often identified as facilitating recruitment into organised criminal groups (Albini 1971; Behan 1996; Brotherton & Barrios 2004; Carvalho and Soares 2016; Ciconte 1992; Decker & Chapman 2008; Gordon 2000; Jhi & Gerber 2015; Sales 2015; Sergi 2016; van San & Sikkens 2017). However, individuals with higher socio-economic status may also become involved in criminal organisations, either because they are attracted by the profit-making opportunities or because they face difficult personal and economic circumstances (van Koppen 2013).

Group identity

Entering some organised crime groups gives access to specific subcultures characterised by a sense of honour, loyalty and respect. Particularly in the mafias, members undergo rites of passage and ceremonies which symbolise their change of status. Being part of this culture is often attractive to members (Albini 1971; Arlacchi 1983; Brotherton & Barrios 2004; Cressey 1969; Gambetta 1993; Hess 1973; Hixon 2010; Lo 2010; Paoli 2003; Sciarrone 2014; Sergi 2016; Zhang & Chin 2002).

The sense of belonging is also an important factor in joining non-mafia organised crime groups (Arsovska 2015; Brotherton & Barrios 2004; Densley 2012; García 2006; Hixon 2010; May 2009). The sense of belonging is further reinforced by social interactions among members of the group and frequent co-offending, thus strengthening the group identity (Densley 2012; García 2006).

Age and gender

The studies included frequently discussed the ages of individuals recruited into organised criminal groups. However, the results suggest that individuals join organised crime groups as either young people (Arlacchi 1983; Arsovska 2015; Carvalho & Soares 2016; Hixon 2010; Kirby et al. 2016; Ostrosky et al. 2012) or adults (Blokland et al. 2019; Giménez-Salinas & Regadera 2016; Kissner & Pyrooz 2009; Kleemans & de Poot 2008; Unlu and Ekici 2012; van Koppen et al. 2010).

Recruitment into organised criminal groups at a young age may occur in different ways. Criminal organisations offer young people an attractive lifestyle and easy access to wealth and material goods (Behan 1996; Hixon 2010; Ostrosky et al. 2012). At the same time, troubled youths with school, drug and financial problems are attracted to organised crime (Arsovska 2015; Behan 1996; Carvalho & Soares 2016). Conversely, adults may become involved in organised crime groups through social connections, work opportunities or specific skills developed earlier in life, or because some groups restrict their membership to adults (Blokland et al. 2019; Kleemans & de Poot 2008).

Studies emphasise the predominance of men in organised crime groups, with a proportion even higher than among the general offending population (Brotherton & Barrios 2004; Hixon 2010; Kirby et al. 2016; Giménez-Salinas, Requena & de la Corte 2011; Unlu & Ekici 2012). Nevertheless, several studies have focused on women's involvement in criminal organisations. While statistically rare, some women participate in organised crime and sometimes perform important roles (Brotherton & Barrios 2004; Requena et al. 2014; van San and Sikkens 2017; see also Fiandaca 2007; Ingrasci 2007).

Ethnicity

The role of ethnicity in organised crime is controversial. Theories such as strain, social disorganisation, subcultures, and culture conflict have often emphasised the importance of ethnic heterogeneity, integration difficulties and limited access to education and economic opportunities as drivers of involvement in criminal groups. Some of the selected studies confirmed that marginalisation and specific ethnic/national characteristics may favour recruitment into organised crime groups (Arsovska 2015; Gordon 2000; Carvalho & Soares 2016). For example, Gordon's (2000) study on criminal groups in Vancouver pointed to mechanisms of strain, frustrations and barriers faced by minorities in achieving material success.

Furthermore, the literature suggests that a shared ethnic background or ethnic homogeneity is an important factor for involvement in some criminal groups (Albini 1971; Ciconte 1992; Cressey 1969; Decker & Chapman 2008; Hess 1973; Lupo 1993; Varese 2011b). A common ethnic origin may strengthen the ties among members and consequently increase the trust necessary to ensure the survival of the group (Arlacchi 1983; Behan 1996; Brancaccio 2017; Gambetta 1993). Decker and Chapman (2008: 96–7) found that groups of Colombian and Cuban drug smugglers often preferred to recruit individuals from the same nationalities due to higher trust in co-nationals.

Psychological factors

Some of the selected studies found that childhood conduct disorder, substance use disorder and psychopathological traits increase the risk of recruitment in organised criminal groups (Hixon 2010; Kissner & Pyrooz 2009; May 2009; Ostrosky et al. 2012; Schimmenti et al. 2014; Sergi 2016).

However, there were contrasting results on the relationship between recruitment into criminal groups and psychopathy. For example, Ostrosky and colleagues (2012) found that individuals in organised crime groups scored medium–high levels of psychopathy, with statistically significant differences compared to a control group. This suggests a lack of empathy and control, callousness, and antisocial behaviours. Conversely, Schimmenti and colleagues (2014) assessed Italian mafia members and other criminals and found low levels of psychopathy overall. Furthermore, mafia members scored lower than other criminals and were not different from the general Italian male population in their degree of psychopathy (Schimmenti et al. 2014). Nevertheless, a logistic regression model showed that higher scores in psychopathy factor 2 (antisocial traits) and lower scores in factor 1 (interpersonal/affective traits) and substance use disorder increased the probability of being a mafia member. These results found some support in a recent study comparing members of the Sicilian Cosa Nostra and the Neapolitan Camorra (Craparo et al. 2018), which found a general absence of psychopathological conditions in the sample.

Discussion and conclusion

The systematic review and the analysis of the selected studies revealed several findings. First, the literature has dedicated limited attention to recruitment into organised criminal groups. Evidence about the factors leading to involvement into criminal groups often came from observational studies assessing different theoretical or empirical issues (eg comparing the levels of violence used by organised crime and other groups). In other words, very few studies have directly examined what factors drive individuals into organised crime. In general terms, older qualitative studies often discussed the factors leading to recruitment based on the assessment of judicial sources and interviews with stakeholders. While providing important insight into the mechanisms of recruitment, this research was often vague on the concept of recruitment and on the operational definition of the factors.

Conversely, quantitative studies provided more specific information on the samples—particularly about age, gender, education, employment, and criminal offences—although the sample selection varied substantially (comprising heterogeneous groups such as convicted mafia offenders, self-reported gang members, or offenders guilty of offences normally associated with organised crime). Quantitative studies variously compared organised crime offenders with the general population, other prisoners, or other serious criminals. The variety of comparison groups may affect the validity of the findings. Mixed-methods studies balance the advantages and disadvantages of qualitative and quantitative approaches and allow a more detailed understanding of the recruitment processes. Thus, mixed-method research may offer one of the best strategies to study organised crime, although it could be more demanding in terms of data gathering.

The selected studies found an association between low educational achievement or low employment qualifications and involvement in criminal organisations, although these conditions may have existed before recruitment. As noted earlier, the studies examined rarely offered enough detail to establish causal or temporal relationships. This means that some of the risk factors identified may be correlates of recruitment, and in some instances they may actually have an inverse relationship with recruitment into organised criminal groups. For example, recruitment into criminal organisations may strengthen an individual's social ties with people involved in crime and lead them to commit a higher number of offences.

Notwithstanding the limitations mentioned above, the available evidence on the recruitment into organised criminal groups emphasised the importance of social relations and criminal background and skills. Regarding social ties, the evidence is broadly consistent with several theoretical interpretations of organised crime. As long ago as the 1970s scholars criticised stereotypes and myths about organised crime in the United States and in Italy and pointed out the importance of brokerage and interaction between 'upperworld' and underworld (Albini 1971; Blok 1974; Hess 1973; Ianni & Reuss-Ianni 1972). Since the late 1990s, analyses of Dutch organised criminals showed that social relations played a crucial role beyond traditional organised crime groups (Kleemans 2014; Kleemans & de Poot 2008; Kleemans & van de Bunt 1999). These findings suggest that social relations drive recruitment into organised crime groups through various mechanisms. For example, social relations may strengthen trust in new recruits, but may also propagate information and opportunities for recruitment into criminal groups.

Overall, the importance of social relations suggests that involvement in organised criminal groups may follow more general social dynamics of group involvement observed not only in gang research but in other sociological fields. Regarding criminal background and skills, the selected literature repeatedly argued that an inclination for violence and rule-breaking and previous criminal records often facilitate recruitment into criminal organisations. When these factors precede recruitment, they may support theoretical interpretations arguing that criminal collectives are mostly the result of individual propensity and self-selection processes (Gottfredson & Hirschi 1990). The difficulties in establishing causality between a criminal background and the recruitment, however, may point to a different conclusion, namely that criminal organisations may enhance individuals' offending. This would also be consistent with evidence from street gang studies showing that gang involvement increases criminal activity (Pyrooz et al. 2016).

The evidence about social relations and criminal background may appear to support contradictory theoretical stances in the nature vs nurture debate. However, it may be that both factors are associated with recruitment into organised criminal groups. For example, organised crime groups may be accessible to individuals with a propensity for violence or law-breaking, but only through social relations. To the best of our knowledge, no research falling within the scope of this study has ever explored the two hypotheses jointly.

From a policy perspective, our results suggest a need for policies addressing the extended social networks of organised crime members to prevent recruitment of new members. While several policies already address individuals with criminal backgrounds and skills (eg by increasing penalties for recidivist offenders, or imposing administrative, police, and judicial restrictions on their rights), social ties have received less attention. For example, children and other relatives of organised crime members could be targeted by welfare, educational and employment programs aimed at preventing recruitment into organised criminal groups.

Last, despite the limitations discussed above, the review showed a growth of studies on recruitment into organised criminal groups adopting more rigorous methods (both qualitative and quantitative). Most of the selected studies were published after 2000 and several additional studies were published after the end of the data collection period (Campedelli et al. 2019; Capri et al. 2018; Fuller, Morgan & Brown 2019; van Dijk, Kleemans & Eichelsheim 2018; Morgan, Brown & Fuller 2018; Sergi 2018). Furthermore, some recent studies have assessed relatively new factors in the field, such as psychological traits (Bottini, Fiorina & Salvato 2017; Ostrosky et al. 2012; Salvato et al. in press; Schimmenti et al. 2014). In conclusion, while this systematic review showed that knowledge of the factors leading to recruitment into organised criminal groups is far from comprehensive, there are reasons to believe that this situation will likely improve within a few years.

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Appendix

Table A1: Included quantitative studies

Source	Type of OCG	Sample*	Data collection	Data analysis	Categories of factors	Country	Relevant findings
Blokland et al. (2019)	Other criminal organisations	601	Official data	Descriptive statistics T-test Chi square Logistic regression	Age Criminal background and skills	Netherlands	Outlaw motorcycle gang membership is positively associated with having a criminal record
Carvalho & Soares (2016)	DTOs	230	Interviews	Descriptive statistics Mincerian regression	Age Ethnicity Educational background Economic conditions	Brazil	Individuals join DTOs for monetary gain
Giménez-Salinas & Regadera (2016)	OCGs	2,384	Investigative files	Descriptive statistics	Age Gender Ethnicity Social ties Criminal background and skills	Spain	Individuals join OCGs because they have special expertise developed outside the criminal world
Jhi & Gerber (2015)	Gangs	190	Survey	Descriptive statistics Logistic regression	Employment Economic conditions	US	Gang membership is positively associated with unemployment
Kirby et al. (2016)	Other criminal organisations	4,109	Official data	Descriptive statistics Chi square Kruskal–Wallis test	Age Gender Ethnicity Criminal background and skills	UK	Compared with general offenders, OC offenders are more often male and ethnically heterogeneous and more likely to have drug offence records
Kissner & Pyrooz (2009)	Gangs	200	Interviews	Logistic regression	Age Social ties Psychological factors	US	Persistent gang involvement is associated with poor self-control
May (2009)	Gangs	138	Survey	Descriptive statistics Correlation Logistic regression	Group identity Psychological factors	US	Gangs constitute a form of social support for members
Ostrosky et al. (2012)	OCGs & DTOs	82	Interviews; Documents	Descriptive statistics	Age Economic conditions Psychological factors	Mexico	Individuals join DTOs seeking monetary gain and a lifestyle characterised by accumulation and display of material wealth

Source	Type of OCG	Sample ^a	Data collection	Data analysis	Categories of factors	Country	Relevant findings
Requena et al. (2014)	OCGs	200	Investigative files	Descriptive statistics	Gender Social ties Silence/omertà	Spain	Women get involved in OCGs through personal networks, ie family ties and emotional ties
Schimmenti et al. (2014)	Mafias	69	Interviews	Descriptive statistics T-test Chi square Logistic regression	Psychological factors	Italy	Mafia members have high levels of antisocial traits and low levels of interpersonal-affective traits of psychopathy
Unlu & Ekici (2012)	DTOs	230	Investigative files	Descriptive statistics Chi square	Age Gender Economic conditions	Turkey	Men from low-income societies can join DTOs and work as couriers for monetary gain
Wang (2013)	DTOs	222	Interviews	Content analysis CHAID Logistic regression	Ethnicity Employment Economic conditions Social ties	UK	Early starters join DTOs to pay for entertainment expenses, while late starters because of financial difficulties

a: The sample reports the number of individuals included in the studies

Note: CHAID=chi-square automatic interaction detection. DTO=drug trafficking organisation. OC=organised crime.
OCG=organised criminal group

Source: Adapted from (Savona, Calderoni, Superchi et al. 2017: 35)

Table A2: Included qualitative studies

Source	Type of OCG	Data collection	Categories of factors	Country	Main findings
Albini (1971)	Mafias	Interviews Informants Documents	Educational background Economic conditions Social ties Group identity Criminal background and skills Silence/omertà	Italy	Recruitment into OCGs is based on friendship, kinship, contract, and patron-client relationships
Arlacchi (1983)	Mafias	Interviews Investigative files Judicial records	Age Educational background Social ties Group identity Criminal background and skills	Italy	Individuals who join mafias come from the middle-class, have an average educational background and have managerial skills
Arsovska (2015)	Other criminal organisations	Interviews Investigative files Judicial records	Age Ethnicity Economic conditions Social ties Group identity Criminal background and skills	Albania, Macedonia, Kosovo, Greece	Individuals are recruited into OCGs based on ethnic ties, kinship ties, and display of violent behaviour
Behan (1996)	Mafias	Interviews Investigative files	Age Economic conditions Social ties Criminal background and skills	Italy	Incarcerated individuals and especially young people attracted by the cult of violence can join mafias
Brancaccio (2017)	Mafias	Investigative files Judicial records	Employment Economic conditions Social ties Criminal background and skills	Italy	Individuals enter mafias because of kinship and blood ties, coupled with poor economic conditions and violent/risk-taking behaviour
Brotherton & Barrios (2004)	Gangs	Interviews Documents	Economic conditions Group identity	US	While females join gangs through blood ties, males rely on kinship and social relations developed in prison
Ciconte (1992)	Mafias	Judicial records Documents	Age Ethnicity Educational background Employment Economic conditions Social ties Criminal background and skills Silence/omertà	Italy	Kinship and blood ties and a lack of legitimate occupations facilitate recruitment into mafias

Table A2: Included qualitative studies (cont.)

Source	Type of OCG	Data collection	Categories of factors	Country	Main findings
Cressey (1969)	Mafias	Interviews Investigative files Judicial records	Age Ethnicity Social ties Group identity Criminal background and skills Silence/omertà	US	Values like honour, loyalty and silence are crucial for individuals aiming to join mafias
Decker & Chapman (2008)	DTOs	Interviews	Ethnicity Economic conditions Social ties Criminal background and skills	US Latin America	Ethnic ties have a crucial role in DTO membership
Densley (2012)	Gangs	Interviews	Group identity Criminal background and skills	UK	Individuals are recruited into gangs based on personal features like criminal competency and group loyalty
Gambetta (1993)	Mafias	Interviews Judicial records	Employment Social ties Group identity Criminal background and skills Silence/omertà	Italy	Upholding the code of silence and having relevant expertise (eg violence) are crucial factors for being recruited into mafias
García (2006)	DTOs	Tapes and CDs	Group identity	Mexico	Individuals get involved in DTOs because of their need for power, belonging, respect, security and pride
Gordon (2000)	Gangs	Interviews	Ethnicity Economic conditions Social ties	Canada	Individuals often access gangs through close friends due to ethnic marginality and the attraction of supportive peer groups
Hess (1973)	Mafias	Judicial records Documents	Educational background Economic conditions Social ties Group identity Criminal background and skills Silence/omertà	Italy	Individuals join mafias through social relations, especially because of their ability to connect criminal members with third parties, like other criminal groups or representatives of legitimate businesses
Hixon (2010)	Gangs	Interviews	Gender Group identity Psychological factors	US	Individuals recruited into OCGs usually have a history of negative and arrested development resulting in antisocial personality disorders

Table A2: Included qualitative studies (cont.)

Source	Type of OCG	Data collection	Categories of factors	Country	Main findings
Lo (2010)	Mafias	Documents	Social ties Group identity Criminal background and skills Silence/omertà	China	Being able to connect people from different environments favours recruitment into Chinese Triads
Lupo (1993)	Mafias	Judicial records Documents	Ethnicity Social ties Criminal background and skills Silence/omertà	Italy	Mafias mainly recruit new members based on ethnicity and kinship/blood ties
Paoli (2003)	Mafias	Interviews Documents	Social ties Group identity Silence/omertà	Italy	The contract of fraternisation (status contract) among mafia members extends the bonds of loyalty and obligation beyond family ties, giving them mutual support and trust
Sales (2015)	Mafias	Judicial records Documents	Educational background Employment Economic conditions Social ties Criminal background and skills	Italy	Individuals capable of strategic use of violence are recruited into mafias
Sciarrone (2014)	Mafias	Judicial records	Social ties	Italy	Mafias mainly recruit new members based blood and kinship ties which are reinforced through an initiation ceremony with specific rituals
Sergi (2016)	Other criminal organisations	Investigative files Documents	Economic conditions Social ties Group identity Psychological factors	Italy	Being part of an OCG results from cultural transmission and gradual learning; therefore kinship and blood ties have a crucial role in the recruitment of new members
van Koppen (2013)	Other criminal organisations	Investigative files	Employment Economic conditions Social ties	Netherlands	Individuals engage in OC activities exploiting their skills and kinship/blood ties, as criminals prefer to work with family members or close friends
van San and Sikkens (2017)	DTOs	Interviews Informants	Gender Economic conditions Social ties	Netherlands Peru	Female smugglers join DTOs mainly through their personal networks, ie family ties, romantic relationships, and friendships

Source	Type of OCG	Data collection	Categories of factors	Country	Main findings
Varese (2001)	Mafias	Interviews Investigative files Judicial records Documents	Social ties Criminal background and skills	Russia	Individuals joining mafias are recruited from a pool of trusted aspirants with no previous connections with law enforcement agents
Varese (2006)	Mafias	Documents	Social ties	Italy	The kin-based system of recruitment into mafias facilitates transplantation of criminal activities in new regions: when an entire family migrates, the criminal group reconstitutes itself
Varese (2011b)	Mafias	Interviews Judicial records Documents	Ethnicity Social ties Criminal background and skills	Italy Hungary US China Argentina	When Russian mafia groups migrate, they recruit new local members based on their dependability and proven ability to use violence
Zhang & Chin (2002)	Other criminal organisations	Interviews	Ethnicity Group identity	US China	Individuals enter Chinese OCGs to make money and because of direct connections with Chinese communities

Note: DTO=drug trafficking organisation. OCG=organised criminal group

Source: Adapted from Savona, Calderoni, Superchi et al. 2017: 37

Table A3: Included mixed-methods studies

Source	Type of OCG	Data collection	Categories of factors	Country	Main findings
Giménez-Salinas, Requena & de la Corte (2011)	Other criminal organisations	Interviews Survey	Age Gender Employment Social ties Criminal background and skills	Spain	Individuals join OCGs because their employment could favour illegal activities or for extra income
Kleemans & de Poot (2008)	Other criminal organisations	Investigative files	Age Employment Social ties Criminal background and skills	Netherlands	Social relations in leisure and work settings may provide opportunities for joining OCGs throughout individuals' lives
Kleemans & van de Bunt (2008)	Other criminal organisations	Investigative files	Employment Social ties	Netherlands	Social relations in leisure and work settings may provide opportunities for joining OCGs throughout individuals' lives
Morselli (2003)	Mafias	Investigative files Documents	Social ties Criminal background and skills	US	Social relations and their management are crucial in the involvement and career in the mafias
van Koppen et al. (2010)	Other criminal organisations	Investigative files	Age Criminal background and skills	Netherlands	Most individuals involved in OCGs join as adults
van Koppen, de Poot & Blokland (2010)	Other criminal organisations	Investigative files	Criminal background and skills	Netherlands	Compared with general crime offenders, OC offenders more often have previous and serious judicial records
Varese (2011a)	Mafias	Investigative files	Gender Ethnicity Social ties	Italy	Women getting involved in the mafias have a more relevant role abroad than in their territory of origin
Varese (2013)	Mafias	Investigative files	Gender Ethnicity Social ties	Italy	Individuals getting involved in the mafias abroad mainly focus on economic investments and resource acquisition

Note: OC=organised crime. OCG=organised criminal group

Source: Adapted from Savona, Calderoni, Superchi et al. 2017: 41

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11. Australian outlaw motorcycle gang involvement in violent and organised crime

Anthony Morgan, Christopher Dowling and Isabella Voce

Outlaw motorcycle gangs (OMCGs) occupy a prominent place in Australia's organised crime landscape. They have been identified by law enforcement as having high levels of involvement in methamphetamine production and distribution, illicit firearms trafficking, tax evasion and money laundering, as well as serious violent crime (Australian Criminal Intelligence Commission 2017, 2015; Sibson 2017).

While there is general acceptance that OMCG members offend more frequently and seriously than non-members (Blokland et al. 2019; Klement 2016; Morgan, Brown & Fuller 2018), the extent of their criminal offending—particularly their involvement in serious and organised crime—remains the subject of some debate (Barker 2015; Goldsworthy & McGillivray 2017; Lauchs & Staines 2019). This study examines offending by OMCG members, chapters and gangs, with a focus on violent and organised crime-type offending, using criminal history data for a large sample of Australian OMCG members known to law enforcement.

Criminal offending by outlaw motorcycle gangs

OMCGs originated in the United States in the 1940s and quickly embraced the identity of 'one percenter' motorcycle clubs, which were not registered with a mainstream motorcycle association and which operated as 'outlaws' outside of the law and societal norms (Barker 2017). They spread quickly into other regions, including Canada, Europe and Australia (Bain & Lauchs 2017). Their growth in numbers has been accompanied by growing concern about their involvement in criminal activity, leading many to conclude that crime is endemic among OMCGs (Bain & Lauchs 2017). Indeed, an 'outlaw motorcycle gang' has come to be most simply defined as a motorcycle club used by members to engage in criminal offending (US Department of Justice 2014). This includes violent crimes designed to protect the club and its reputation, its members and its territory, and more profit-motivated crimes that enhance the gang's power or economic resources (Quinn & Koch 2003; US Department of Justice 2015).

Despite this, there has been limited empirical research into criminal offending by OMCG members compared with, for example, street gangs (Pyrooz et al. 2016). This is largely because of the challenges associated with accessing administrative data on OMCG membership in recorded crime samples, and the difficulties of using methods such as surveys, as have been used in studies of youth gangs, given that members are unwilling to speak to outsiders (Blokland et al. 2019; Silverstone & Crane 2017).

Studies that have used the criminal histories of relatively large samples of OMCG members have found the majority of members have an official history of recorded offending. An early Canadian study of 62 gangs in Quebec found that 70 percent of members had a criminal record, and 42 percent had been in prison (Tremblay et al. 1989). Klement (2016) found that 92 percent of Danish OMCG members had a criminal record. Blokland et al. (2019) reported that 82 percent of OMCG members in the Netherlands had been convicted at least once since the age of 18—58 percent for violence and 30 percent for drug offences—while 36 percent had been in prison. Recent studies comparing OMCG members with non-members have shown that OMCGs recruit individuals with a greater propensity for crime, particularly violent crime, and that joining a gang leads to further offending, including profit-motivated offending (Blokland et al. 2019; Klement 2016; Pederson 2018). Morgan, Brown and Fuller (2018) found the average total lifetime cost to the taxpayer of offending by OMCG members, based on both crime and prison costs, was \$1.3m.

A smaller number of studies have examined patterns of offending by groups, rather than by individuals, and attempted to assess the extent to which OMCGs are involved in organised crime. These studies have tended to rely on open source data, including media reports and court transcripts, and case studies of notorious individuals and events. For example, Barker and Human (2009) examined the crimes of the Hells Angels, Outlaws, Bandidos and Pagans motorcycle gangs based on a search of newspaper articles, finding a high degree of involvement in ongoing criminal enterprises, including the supply of drugs and weapons, as well as both planned and spontaneous acts of violence towards other gang members.

Three recent Australian studies have examined OMCG involvement in organised crime in Queensland. Lauchs (2018) analysed data on the Finks motorcycle club presented in a Queensland Police Service application to the Supreme Court, concluding there was limited evidence of radical or profit-motivated criminal activity (eg serious drug offences or money laundering). Lauchs and Staines (2019) conducted further analysis of the Supreme Court application, along with Supreme Court judgements and media reports relating to offences committed by 112 OMCG members. They found that, while OMCG members committed serious offences, there were relatively few examples of organised crime or of gang leaders being involved in criminal activity. Both studies concluded that OMCGs were not acting as criminal organisations.

Goldsworthy and McGillivray (2017) compared the number of proven charges for Queensland OMCGs with total reported offences for different crime types, concluding that OMCGs accounted for less than one percent of all crime. Although they acknowledged the involvement of OMCGs in methamphetamine distribution, they argued claims about OMCG involvement in organised crime had been overstated. However, this study relied on aggregate data, did not examine rates of offending among OMCG members or groups, and likely underestimated OMCG involvement in crime by comparing convictions with overall recorded offences.

The reliance on small, non-representative samples has left several unanswered questions regarding OMCG involvement in organised crime. It remains unclear whether OMCGs comprise individuals involved in organised criminal activity, whether there are cliques within gangs and chapters who collaborate to commit crime, or whether they are in fact criminal organisations (Barker 2017; Blokland, Soudijn & van der Leest 2017; Lauchs & Staines 2019; von Lampe 2019).

Aim and method

Research questions

Building on this prior research, this study aims to address the following research questions:

- How prevalent is offending by OMCG members and chapters?
- How concentrated is offending and associated harms among OMCG members and chapters?
- To what extent can Australian OMCGs be characterised as criminal organisations?

Sample

To address these research questions, the criminal histories of 5,669 individuals identified by law enforcement as being affiliated with an OMCG were analysed. This sample was created by matching records from two Australian Criminal Intelligence Commission databases: the National Gangs List (NGL) and the National Police Reference System (NPRS). The NGL is a secure, validated list of OMCG members. State and territory police contribute to the NGL, while the Australian Gangs Intelligence Coordination Centre manages the database. Motorcycle clubs are classified as an OMCG and included on the NGL if they meet criteria developed by the Gangs Intelligence Coordination Centre in partnership with Commonwealth and state and territory law enforcement. An OMCG is a motorcycle club whose members use the club to engage in criminal offending, while an OMCG member is a person who identifies themselves as belonging to the OMCG and is treated by other gang members as such. This is verified using law enforcement intelligence based on agreed indicators of gang membership.

The NPRS database holds current and detailed national police information designed to assist operational police throughout Australia in dealing with and responding to persons of interest, including the offence history of individuals who have been arrested by police. Individuals on the NGL were matched with criminal history records on the NPRS by the Australian Criminal Intelligence Commission's Advanced Analytics team using name, date of birth and residential address. This initial sample was then de-identified before being transferred to the Serious and Organised Crime Research Laboratory.

When the data were extracted, there were 39 OMCGs and 475 chapters (regional branches). The NGL includes office bearers, other patched members and prospects. Patched members are those with full voting rights and the right to wear full colours. Office bearers include members in executive roles, including chapter presidents, vice-presidents, secretaries, treasurers and sergeants-at-arms. Prospects include nominees or probationary members who do not have full membership or the right to wear full colours but who are still affiliated with the gang. Of the 5,669 individuals on the NGL, 951 (17%) were prospects and 4,718 (83%) were patched members, of whom 12 percent ($n=555$) were listed as office bearers. This paper uses the term 'members' to describe both patched members (office bearers and others) and prospects. Prospects are included in the analysis of OMCG involvement in crime because their offending—particularly their recent offending—is likely to be related to their affiliation with the gang. Associates or supporters were not included in the data collection. All of the OMCG members on the NGL, including patched members and prospects, were male.

Four members were excluded from the analysis of offending due to apparent duplicated or erroneous criminal history matches. Of those remaining, 84 percent had a recorded criminal history, and more than 121,000 offences were linked to these individuals. Minor traffic offences (eg speeding and parking offences) were excluded because these offences are not uniformly uploaded to the NPRS by all jurisdictions.

Analysis

Offences were classified according to the typology developed by Quinn and Koch (2003), which categorises offences based on the type of activity, motivation for offending, and the degree of planning involved. The following offence categories were used:

- *any offence* resulting in an apprehension (excluding minor traffic offences);
- *violence and intimidation*, including homicide, assault, kidnapping and threatening behaviour;
- *drug supply*, including importation, manufacturing and dealing;
- *ongoing criminal enterprise*, including the commercial supply of drugs and firearms, serious fraudulent activity and serious regulatory offences; and
- *short-term instrumental offences*, including robbery, burglary, theft, minor fraud and non-commercial drug dealing.

Importantly, our measure of violence and intimidation does not distinguish between different types or targets of violence. It includes intra-gang violence (eg violence targeting a member leaving in bad standing), inter-gang violence (eg a brawl between competing gangs), and other forms of violence directed towards non-gang members, such as family and domestic violence.

A focus of this study is OMCG involvement in organised crime. Ongoing criminal enterprise is used as a proxy for organised crime-type offending, as it best reflects the range of offences that meet the definition of serious and organised crime used in the *Australian Crime Commission Act 2002* (Cth): offences requiring a high degree of planning, organisation and sophistication. Although the presence of co-offending (ie offences involving two or more offenders) could not be established using these data, which is a limitation of the measure of organised crime involvement used in this study, these offences represent the types of crimes that are typically committed in concert with other individuals.

Limitations

The final sample was limited to individuals who had been identified by law enforcement as being affiliated with an OMCG and added to the NGL. While the significant investment by law enforcement in the proactive policing of OMCG members increases the likelihood of identification, it is likely that some members may not be included on the NGL, or that membership status is not current. It is also a point-in-time estimate (as at May 2019) of gang affiliation—those individuals who have left an OMCG were removed from the database and are not included in the analysis that follows.

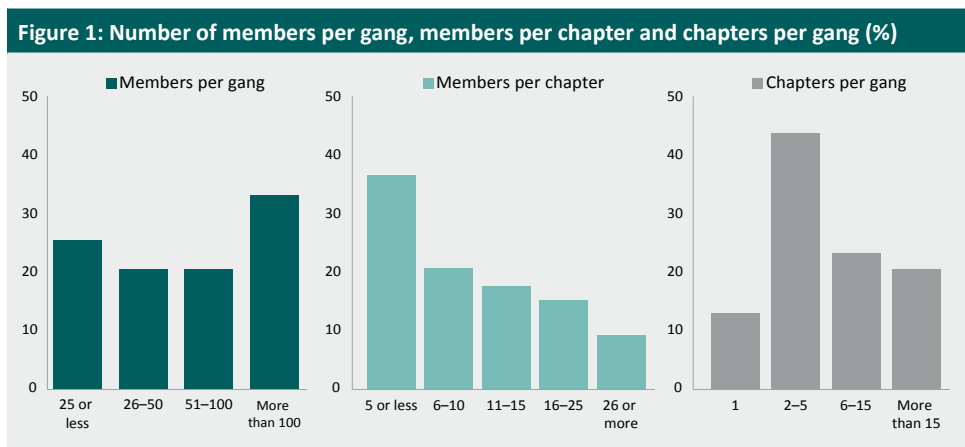
Offences listed on the NPRS are not limited to crimes for which a person has been convicted. Rather, the system contains information on offences for which they have been apprehended by police. Similarly, not all offences will have been detected or reported to police, largely because of the characteristic secrecy and loyalty of gang members. Likewise, certain offences are likely to be over-represented in the criminal history of OMCG members because of targeted law enforcement activity and policing at public events such as national runs. The picture of criminal activity presented in this study therefore reflects the range of offences for which OMCG members have been apprehended. The focus on selected categories of more serious offence types aims to help distinguish between those offences which are more likely to be detected through routine and proactive law enforcement against OMCGs, and those which are more likely to be reported to law enforcement or identified through an investigation.

Results

Gang and chapter size

The size of gangs and chapters varied considerably (Figure 1). At the point of data extraction, one quarter of gangs had 25 or fewer members, while one in three had more than 100 (mean=145.4, standard deviation (SD)=253.7). There was an average of 12.2 chapters per gang (SD=21.9). A small number of gangs ($n=5$, 13%) had only one chapter, 44 percent had between two and five chapters, 23 percent had between six and 15 chapters, and 21 percent had more than 15 chapters. Chapter size also varied, with the largest proportion (37%) having five or fewer members known to law enforcement, two in five (42%) more than 10 members, and one in 10 more than 25 members (mean=11.7, SD=12.0).

Gangs also varied in their reach, based on the presence of chapters in multiple states and territories. More than half of all gangs (54%) had a chapter established in more than one jurisdiction. Fifteen percent had chapters in two jurisdictions, 15 percent in three jurisdictions, and nearly one in four (23%) had a chapter established in four or more jurisdictions.



Note: Chapters exclude national executive or chapters with no jurisdictional assignment

Source: OMCG criminal history database 2019 [computer file]

The age profile of gangs varied: while some gangs had a relatively young profile, others were significantly older. The average age of members ranged from 33 years to 58 years. Many of the larger gangs (with more than 100 members) had younger members. In many gangs with younger members, a greater proportion were prospects. The average age of prospects (mean=36.5, SD=10.4) was nine years younger than that of non-office bearers (mean=45.6, SD=12.2) and 10 years younger than that of office bearers (mean=46.4, SD=12.3).

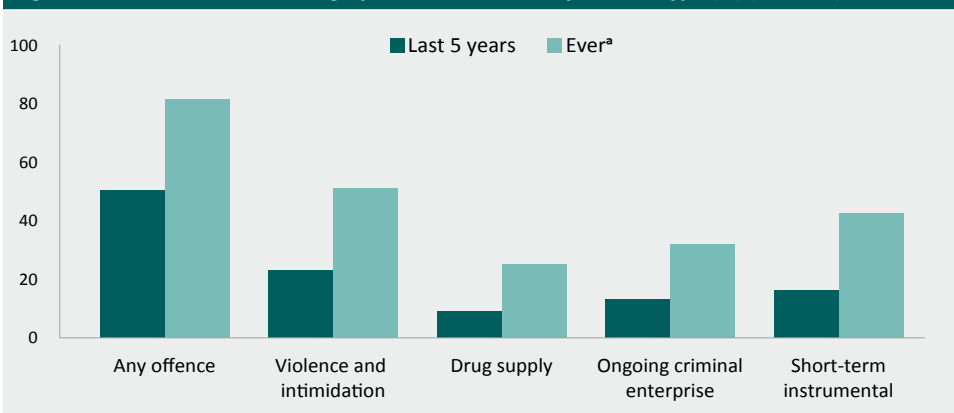
Prevalence of offending

Measures of the prevalence of offending by OMCG members and chapters were based on the analysis of both recent offending—defined as offences occurring in the five years up to and including 2017–18—and offending over their entire criminal history. Given the limits of historical apprehension data, ‘entire criminal history’ refers to all offences recorded since 1990. Recent offending is of particular interest, given it provides the best approximation of crime committed while affiliated with an OMCG, or in the period immediately prior to joining (when gang affiliations may still play a role). It also reflects the period in which there has been a more intense focus by law enforcement on OMCGs and their involvement in serious crime.

Half of all OMCG members (50%) had been apprehended by police for at least one recent offence, and four in five members (81%) had been apprehended for at least one offence since 1990 (Figure 2). One in four members (23%) had been apprehended for a recent violence and intimidation offence, while half (52%) had a recorded history of violent offending.

Profit-motivated offending was also common among members. Nine percent of members had been apprehended for a drug supply offence in the previous five years. One in eight members (13%) had a recent history of ongoing criminal enterprise, which includes commercial drug supply and other offences characteristic of organised crime. One in three members (32%) had a prior history of ongoing criminal enterprise. Short-term instrumental offences were slightly more common, with around one in six members (16%) having recently been apprehended for a short-term instrumental offence. Overall, more than one in five members (22%) had been apprehended for a profit-motivated offence—meaning either ongoing criminal enterprise or a short-term instrumental offence—within the last five years. Half of all members (51%) had a prior history of profit-motivated offending.

Figure 2: Prevalence of offending by OMCG members, by offence type (%) (n=5,665)



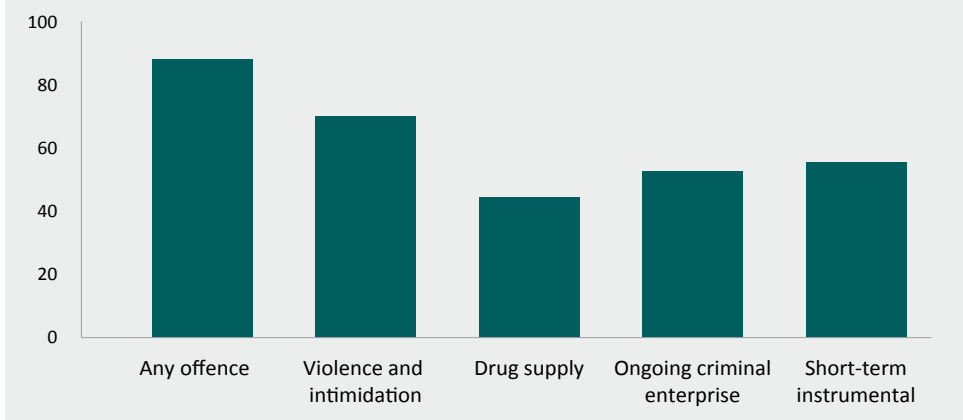
a: Includes all recorded offences since 1990 due to limits of historical criminal history data

Source: OMCG criminal history database 2019 [computer file]

While these offending rates seem high, it is difficult to draw definitive conclusions about how the level of offending among OMCG members compares to the general population without a comparison group of non-OMCG members. In place of this, rates of offending in this study were compared with the results of a recent birth cohort study from New South Wales, which measured rates of criminal justice contact among people born in 1984 up to age 33 (Weatherburn & Ramsey 2018). Importantly, Weatherburn and Ramsey (2018) defined criminal justice contact as a court appearance, youth justice conference or police caution, whereas our study is based on apprehension data; not all apprehensions will result in a court appearance or caution. Nevertheless, Weatherburn and Ramsey (2018) reported that 33 percent of all men born in 1984 had at least one criminal justice contact (excluding traffic offences) by age 33. In the current study, 85 percent of OMCG members who were born in 1984 ($n=142$) and 81 percent of OMCG members whose full criminal history from age 10 could be analysed ($n=659$) had been apprehended for at least one offence (excluding traffic offences) by the age of 33. Even with the potential for attrition of cases between arrest and a matter proceeding to court, this is a sizeable difference.

The prevalence of recent offending by OMCG chapters is based on whether at least one member within each chapter had been apprehended by police in the five years up to and including 2017–18 (Figure 3). The prevalence of offending was significantly higher among chapters, meaning that offending was more evenly distributed between groups than individuals.

Figure 3: Prevalence of recent offending by OMCG chapters, by offence type (%) (n=475)



Source: OMCG criminal history database 2019 [computer file]

Nine in 10 OMCG chapters (88%) had at least one member apprehended for an offence within the last five years. More than two-thirds of chapters (70%) had at least one member recently apprehended for violence and intimidation offences, more than two in five (44%) had at least one member with a recent drug supply offence, and more than half (53%) had at least one member apprehended for ongoing criminal enterprise. Overall, two-thirds of chapters (63%) had at least one member who had recently been apprehended for a profit-motivated offence.

Concentration of offending and associated harms

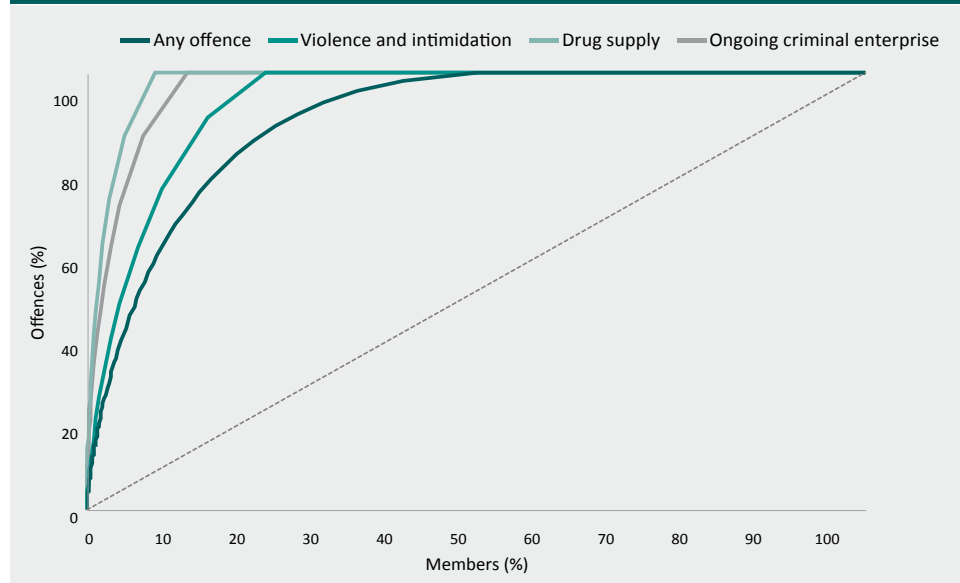
Prevalence estimates overlook the disproportionate number of offences committed by a small group of members. It is well established that offending is concentrated among a relatively small group of individuals (Martinez et al. 2017). This is true even in studies focused on criminal groups (Ratcliffe & Kikuchi 2019). The next stage of the analysis therefore examined offending concentration among OMCG members and chapters.

Offending concentration takes into account both the prevalence of offending and the frequency of offending by those who offend. It is measured using the cumulative distribution of offending. The cumulative percentage of members is plotted on the x-axis, and the cumulative percentage of offences for which these offenders are responsible is plotted on the y-axis (a Lorenz curve). If offending were perfectly evenly distributed, it would follow the dotted 45-degree line, referred to as the line of equality (see Figure 4). The further the actual curve is from this line, the greater the concentration of offending.

Figure 4 displays the cumulative distribution of offending by members in four major offence categories—any offence, violence and intimidation, drug supply and ongoing criminal enterprise—in the five years up to and including 2017–18. This shows a high degree of concentration, with drug supply and criminal enterprise offences more heavily concentrated than violence and intimidation offences. In practical terms, this figure shows:

- five percent of members accounted for 42 percent of all offences;
- four percent of members accounted for 47 percent of all violence and intimidation offences;
- five percent of members accounted for 85 percent of all drug supply offences; and
- four percent of members accounted for 70 percent of all criminal enterprise offences.

Figure 4: Cumulative distribution of offending by members, by offence type (%) (n=5,665)

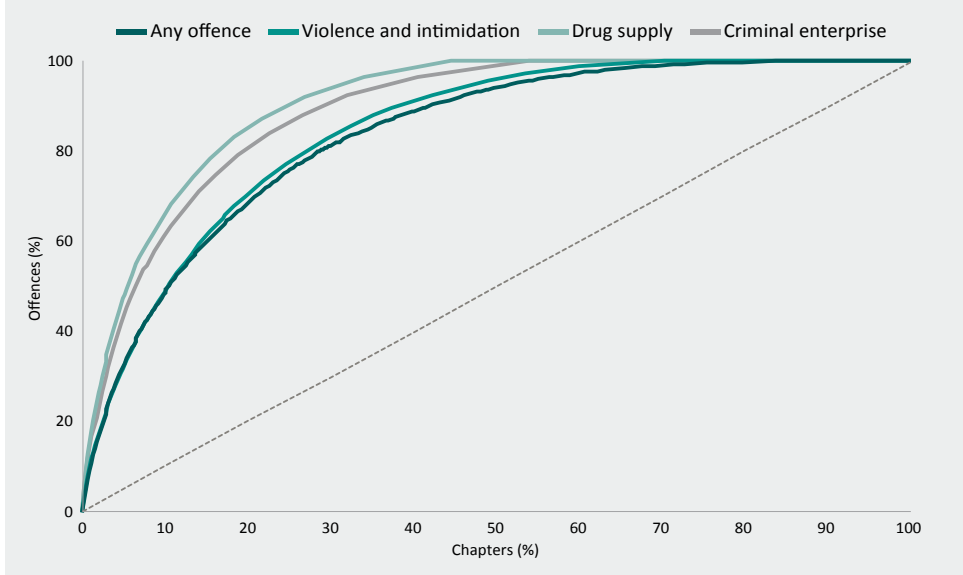


Source: OMCG criminal history database 2019 [computer file]

The same analysis was repeated for OMCG chapters (Figure 5). This shows that, while offending was not as concentrated among chapters as it was among members, a small proportion of chapters still accounted for a disproportionate amount of all crime committed by OMCGs over a five-year period. More specifically, five percent of chapters accounted for:

- 33 percent of all offences;
- 34 percent of all violence and intimidation offences;
- 48 percent of all drug supply offences; and
- 44 percent of all ongoing criminal enterprise offences.

Figure 5: Cumulative distribution of offending by chapters, by offence type (%) (n=475)

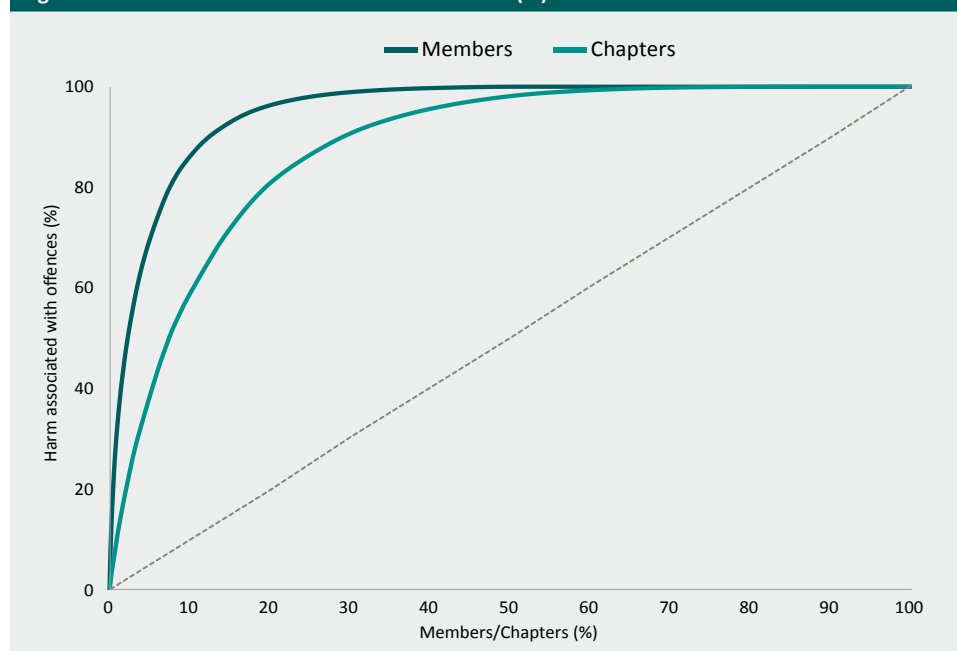


Source: OMCG criminal history database 2019 [computer file]

Within these selected offence categories there is a wide variation of offences with differing levels of harm to victims and the wider community. There is growing recognition of the potential value of measures of crime harm that better account for the impact of offences, rather than the number alone (Ashby 2017; Ratcliffe & Kikuchi 2019). Concentration of offending by both members and chapters was re-analysed using a modified version of the Western Australian Crime Harm Index (WACHI) developed by House and Neyroud (2018), which assigns the most common offence types a harm index based on the court penalties imposed on first-time offenders. The WACHI was developed for Australian Standard Offence Classification codes; these were mapped to the Australian and New Zealand Standard Offence Classification (ANZSOC) codes used in the OMCG criminal history database, and weighted means were used to aggregate sub-groups into standard offence classifications. ANZSOC codes without a WACHI code were assigned a harm index in one of two ways—by estimating them directly based on equivalent offence types, or by using the imprisonment rates and average custodial sentence lengths published by the NSW Bureau of Crime Statistics and Research (2019) and Sentencing Advisory Council (Vic) (2015) to calculate multipliers that were then used to estimate scores based on existing WACHI scores.

The cumulative distribution of offence harm was measured using the WACHI scores for all offences over a five-year period (Figure 6). The results showed that, while five percent of OMCG members accounted for around 42 percent of all recorded offences, five percent of members (not necessarily the same five percent) accounted for around 70 percent of the harm. This represents fewer than 300 of the 5,665 individuals in the sample. The results were not as stark at the group level, with five percent of chapters accounting for 39 percent of all harm (compared with 33 percent of all offences), indicating that the most harmful offences were more evenly spread across those chapters involved in criminal activity.

Figure 6: Cumulative distribution of offence harm (%)



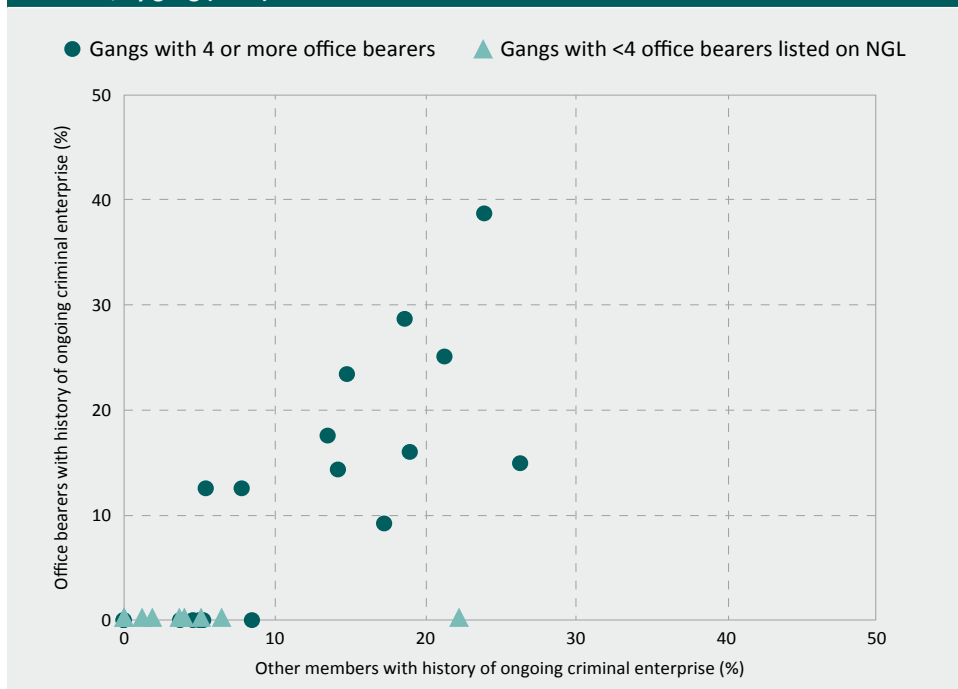
Source: OMCG criminal history database 2019 [computer file]

Assessing the degree to which OMCGs are criminal organisations

While the prevalence of offending at the group level—be it chapters or gangs—is very high, this does not directly address the question of whether OMCGs are criminal organisations, or whether they are groups with some members who are involved in criminal activity (Lauchs & Staines 2019; von Lampe 2019). Barker (2015) argued that the degree to which an OMCG is a criminal organisation is based on two criteria: the extent to which the members within a chapter or gang are involved in organised criminal activity, and whether the office bearers in that group—those performing an executive or leadership function—are involved in those activities.

Blokland, Soudijn and van der Leest (2017) operationalised this definition by plotting the percentage of members and the percentage of office bearers in the Netherlands who had a criminal record. Groups with a higher percentage of both members and office bearers with criminal records were assessed as being further along the criminal organisation continuum. We followed a similar approach; however, rather than relying on the presence of a criminal record—since the vast majority of members have been apprehended for at least one offence, some of which may be a consequence of proactive policing—the current study focused on ongoing criminal enterprise (Figure 7). Moreover, the focus was on recent offending (within the last five years), which provides the best approximation of crime committed while affiliated with an OMCG. Results are presented for gangs with four or more office bearers on the NGL ($n=18$) and gangs with fewer than four office bearers on the NGL ($n=10$). Gangs that did not have any members identified as officer bearers on the NGL ($n=11$) were excluded from this assessment. Importantly, the absence of office bearers on the NGL does not mean a gang does not have any leaders; rather, it may be that individuals in leadership positions are not known to law enforcement, or law enforcement intelligence has not been able to establish which gang members hold leadership positions.

Figure 7: Prevalence of recent ongoing criminal enterprise among office bearers and other members, by gang ($n=28$)



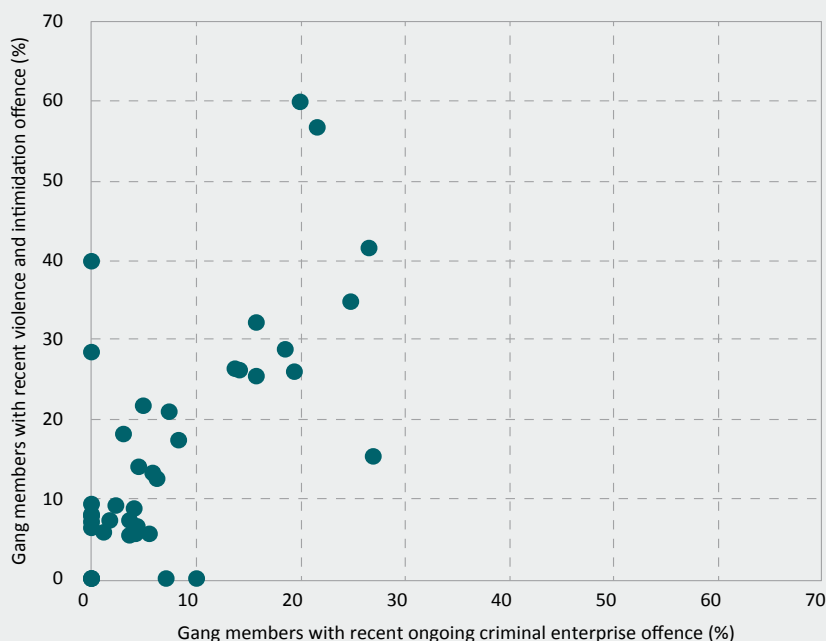
Note: Excludes gangs which do not have any office bearers listed on the NGL ($n=11$). Prevalence of recent offending based on five years up to and including 2017–18

Source: OMCG criminal history database 2019 [computer file]

The prevalence of recent ongoing criminal enterprise offences among office bearers and other members, by gang, is presented in Figure 7. Notably, given Barker's (2015) criteria for identifying OMCGs as organised crime groups, in 11 gangs (39%) both office bearers and other members had been apprehended for organised crime-type offences. In eight of these gangs (44% of those with four or more office bearers, and 29% of all gangs with at least one officer bearer), at least 10 percent of office bearers and other members had been recently apprehended for ongoing criminal enterprise offences. The involvement of both office bearers and other members in recent organised crime-type offences indicates that these gangs are criminal organisations. This is a conservative assessment; when a longer observation period (25 years) is used, all gangs with four or more office bearers have both office bearers and other members with a history of ongoing criminal enterprise, and all 28 gangs with at least one office bearer on the NGL have members who have been involved in organised crime-type offending.

Finally, the prevalence of recent ongoing criminal enterprise offending among gangs was compared with the prevalence of recent violence and intimidation offences (Figure 8). Twenty-nine gangs (74%) had members with a recent history of ongoing criminal enterprise offences, while all but three gangs (92%) had members with recent violence and intimidation offences. There was a moderate positive correlation ($p=0.57$), indicating that gangs with a higher prevalence of recent ongoing criminal enterprise generally have a higher prevalence of violence and intimidation offences. More specifically, those gangs that were classified as criminal organisations also had a high propensity for violence and intimidation.

Figure 8: Prevalence of recent ongoing criminal enterprise and violence and intimidation offences, by gang ($n=39$)



Source: OMCG criminal history database 2019 [computer file]

Discussion

This paper has described the results from the analysis of recorded criminal offending among a national sample of Australian OMCGs. It builds upon the smaller, state-specific studies by Lauchs (2018), Lauchs and Staines (2019) and Goldsworthy and McGillivray (2017), which relied on open source data, and draws on recent international research using administrative data (Blokland et al. 2019; Klement 2016; Pederson 2018) to profile offending by OMCGs currently active in Australian states and territories. It addresses important questions about the prevalence and distribution of offending among OMCGs, including involvement in violent and organised crime.

Consistent with findings from overseas (Blokland, Soudijn & van der Leest 2017), the current study demonstrates the diversity that exists among Australian OMCGs in gang and chapter size, member age and offending profiles. Chapters vary significantly in size, ranging from a handful of members to much larger groups. They also vary in the age profile of members. While chapters comprise members of different ages, some chapters are dominated by younger members, with others comprising mostly older members. The offending profiles of chapters also vary. While a small number of chapters account for a disproportionate amount of recorded crime, some chapters have not had any members apprehended by police for recent offending. Gangs also vary in their propensity for violent and organised crime, as well as the extent to which senior leaders are involved in criminal activity.

Despite this diversity, several conclusions may be drawn about the criminal offending of OMCGs. There is a high prevalence of offending among OMCG members, including involvement in violence and intimidation and organised crime offending. In fact, recent profit-motivated offending—comprising both short-term instrumental offences and ongoing criminal enterprise—was as common among OMCG members as violent offences. While it is difficult to compare rates of offending in different populations, the prevalence of any offending (excluding driving offences) was substantially higher among OMCG members than among men reported in a recent NSW birth cohort study (Weatherburn & Ramsey 2018).

Despite the high prevalence overall, offending was still concentrated among a small proportion of members, as was the harm associated with offending. A similar pattern was observed among chapters; however, crime and crime-related harm were more evenly distributed among chapters than among individuals. Nevertheless, this is an important finding, because if these individuals can be identified and targeted for intervention—ideally early in their offending trajectory—the potential reduction in crime and associated harm is significantly greater. Some caution is needed here, since the reliance on arrest data may mean that office bearers and those successful at evading arrest are overlooked, but there is growing evidence of the potential benefits of a harm-focused approach to prioritising offenders, including in gang contexts (Ratcliffe & Kikuchi 2019).

Notwithstanding the concentration of offending, the fact that crime was more evenly distributed between chapters than between members, and that so many gangs had members—whether office bearers or not—with a recent history of violence and ongoing criminal enterprise, is consistent with the growing body of evidence that OMCG membership has an enhancement effect, meaning that joining a gang increases members' propensity to commit crime (Blokland et al. 2019). It is notable that nearly half of all offenders who had committed a violent or organised crime-type offence had done so in the last five years, when they were almost certainly affiliated with an OMCG. It is evident that OMCGs attract members with a propensity for committing violent and organised crime, and facilitate further offending among their members.

Given that previous Australian research has tended to suggest the organised criminality of OMCGs has been overstated (Goldsworthy & McGillivray 2017; Lauchs 2018; Lauchs & Staines 2019), it is of particular interest that the evidence presented here suggests that OMCG members, chapters and gangs are indeed frequently involved in offences associated with organised crime. Drawing on Barker's (2015) characterisation of criminal organisations, 11 gangs had members—including both office bearers and others—with recent histories of organised crime-type offending. In eight gangs (nearly one in three gangs with at least one office bearer), more than 10 percent of all members (office bearers and others) had been recently apprehended for organised crime-type offences. This indicates they are criminal organisations. Half of all chapters and three-quarters of the gangs on the NGL had members with a recent history of organised crime-type offending.

Further, those gangs with the highest prevalence of organised crime-type offences were among those with the highest prevalence of violence and intimidation offences. Although the motivation for and context of these offences cannot be determined from recorded crime data alone, the overlap between offence types suggests that the violence may be used to facilitate organised criminal activity, rather than being limited to 'barbarian' type offending (Lauchs, Bain & Bell 2015). OMCGs can use violence to enable organised crime offending in a number of ways, including in territorial disputes, in building the reputation of the gang or in extortion (Lauchs, Bain & Bell 2015).

This study provides, for the first time, a national picture of recorded offending by Australian OMCGs. While highlighting high rates of criminal activity, including violent and organised crime, it also demonstrates the potential value of law enforcement and policy measures targeted at high-risk individuals, chapters and gangs. Further work is needed to develop a better understanding of the individual and group-level factors that contribute to higher rates of criminal offending among OMCG members and gangs. Nevertheless, this study represents an important first step in advancing our understanding of the relationship between OMCG membership and criminal offending.

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12. The relationship between drug price and purity and population level harm

Caitlin Hughes, Shann Hulme and Alison Ritter

Introduction

National and international drug markets feature frequent changes in the price and purity of illicit drugs (Australian Criminal Intelligence Commission 2019; European Monitoring Centre for Drugs and Drug Addiction 2018; United Nations Office on Drugs and Crime 2018). For example, the average price of cocaine per gram in the United States decreased more than threefold between 1977 and 1989, from US\$316 to US\$97 (Caulkins 2001). There can be even greater variation over the short term—for example, the retail purity of heroin sold in New South Wales varied between 13 and 80 percent over a two-year period (Weatherburn et al. 1995). International research has further shown that price and purity can shape drug consumption and in turn drug-related harm. For example, Caulkins (2001) showed that the fall in the retail price of pure cocaine in the United States was associated with increased cocaine-related emergency department (ED) presentations. However, there remains limited understanding of the universality of the relationship—that is, to what extent relationships between price, purity and drug-related harm vary by place, time and drug type. Clarifying the relationship is important to inform targeted law enforcement and harm minimisation strategies, and illicit drug monitoring systems.

This project aimed to review existing research that has examined the relationship between price, purity and drug-related harm at the population level. More specifically, it aimed:

- to examine the relationship between retail-level price and purity, and seven population level drug-related harms (ambulance call-outs, ED presentations, hospital admissions, treatment admissions, fatal and non-fatal overdoses, property crime, and violent crime);
- to identify differences in the relationship between price, purity and harm across three drug types: heroin, cocaine and meth/amphetamine; and
- to identify factors that may moderate these relationships.

Price and purity in illicit drug markets

As outlined by Caulkins and Reuter (1998), there are many reasons why it is important to understand price and purity in illicit drug markets. Firstly, it helps us understand whether and how illicit drug markets differ to other illicit and licit markets. Here research has shown that the price of illicit drugs is extraordinarily high—particularly given drugs are relatively inexpensive to make, with much of their mark-up compensating for the risks of criminal sanctions or theft and violence from other market players (Reuter & Kleiman 1986). Secondly, price and purity data can inform analysis of the impacts of enforcement (Bright & Ritter 2010; Caulkins & Reuter 1998). Evidence suggests that law enforcement tends to have short-term rather than long-term impacts (Bright & Ritter 2010). Herein we focus on a third application—impacts of price and purity on drug-related harms, both health and criminal justice related.

Several concepts and assumptions underpin this work. The first is that people who use drugs are price-sensitive—that is, there is elasticity of demand: when prices increase, consumption decreases. Numerous studies have found changes in consumption as a result of changes in price, and that these changes occur in non-dependent and dependent populations and across multiple illicit drugs (Caulkins 2007; Gallet 2014; Rhodes et al. 2000). The second assumption is that drug consumption is associated with harm, and that price-driven changes in consumption will influence harms. Again, a clear body of work shows the multiple harms associated with drug consumption such as overdose, property crime and violence (Babor et al. 2018; Degenhardt et al. 2013). Given that around 20 percent of people consume around 80 percent of drugs, harms are most notable among people who are drug dependent or who consume drugs regularly. For example, in Australia the annual social cost of health, crime and road accidents for someone who is opiate dependent is estimated to be \$105,342, compared to \$1,965 for someone who is non-dependent (Moore 2007).

Third, consistent with basic economic theory, we anticipate that the relationship between price and harms will vary according to the outcome of interest and the length of time since the price or purity changed. For health harms (eg overdose) we anticipate that, if price increases, consumption and associated health harms will fall, and that this relationship will hold over the short and long term. For treatment outcomes, we anticipate that, if price increases, treatment admissions will fall, but the relationship will be shaped by the supply of treatment, including levels of funding, availability and quality. For impacts on drug-related crime, as outlined by Caulkins and Reuter (1998) we expect the relationship will be ambiguous. This is because increased price may lead to more property crime to support purchasing at higher prices. However, if people who use drugs are more sensitive to price, then increased price may lead to reduced property crime due to declines in consumption among heavy users. Similar arguments can be made in relation to violence. Economic theory also suggests impacts on drug-related crime and treatment may differ in the short and long run due to delays in behavioural adaptation.

A further important principle is the difference between price, purity and purity-adjusted price (PAP). The actual value of an illicit drug is a function of the quantity purchased, the price paid and the purity of the drug (Caulkins 2007). As such, even when prices unadjusted for purity are quite flat (see, for example, the Illicit Drug Reporting System and Ecstasy and Related Drug Reporting System price series for Australia, in which price has been remarkably stable over many years; Peacock et al. 2018) this can mask large variations in the purity of the drug. This was clearly demonstrated during the Australian heroin shortage, when the price of heroin in Victoria increased from \$300 per gram in 2000 to \$450 in 2001—a 50 percent increase—but purity declined from 46 percent to 16 percent, meaning PAP for heroin increased by 325 percent (Caulkins 2007). For this reason, the strongest evidence comes from studies measuring PAP, not price or purity alone.

Finally, it is important to distinguish between (a) the relationship between PAP and harm (eg inverse or direct) and (b) the impacts on harm (eg increased or reduced), as impacts are shaped by both the relationship between PAP and harm and the trends in PAP. For example, if there is an inverse relationship and PAP is decreasing, harms will increase, but if there is an inverse relationship and PAP is increasing, harms will reduce.

Method

This study employed a rapid review methodology—a form of evidence synthesis that provides a rigorous method for locating, appraising and synthesising evidence from previous studies, and producing results in a timelier manner than a systematic review (Ganann, Ciliska & Thomas 2010). Consistent with rapid review methodologies, this study was designed in consultation with end users (the Australian Institute of Criminology), used a limited number of electronic databases (five), and involved tight inclusion criteria and one principal coder. A potential limitation of a rapid review is that some studies may not be identified; however, this can be mitigated by including grey literature as well as journal articles and by consulting experts in relation to the included literature (Ganann, Ciliska & Thomas 2010). Both steps were adopted for this review (see below).

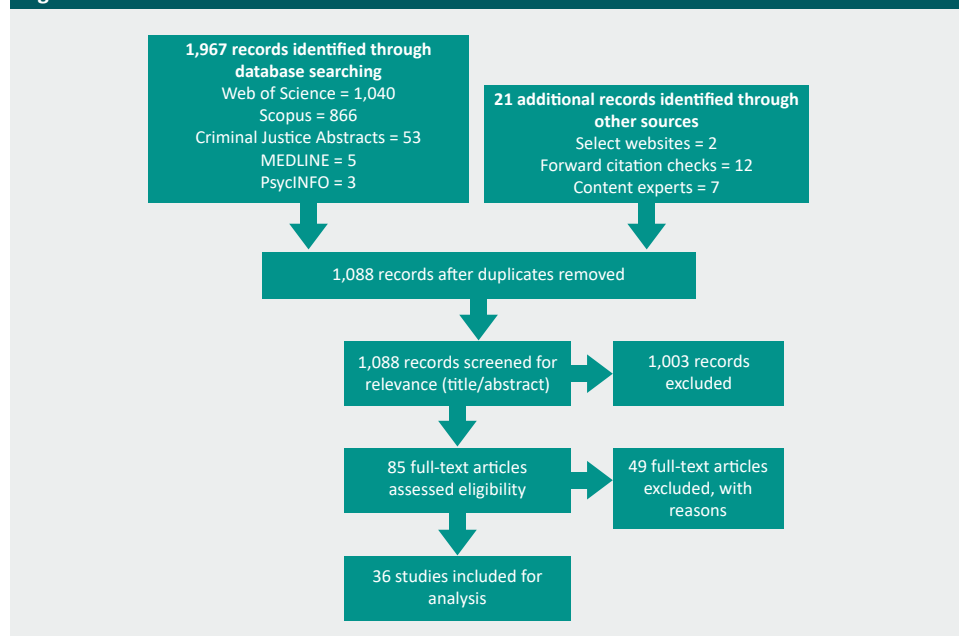
Search strategy

The search strategy involved four stages. First, comprehensive searches were conducted in five databases of peer-reviewed articles: Web of Science, PsycINFO, MEDLINE, Scopus, and Criminal Justice Abstracts. Search terms were specified based on the research questions, as follows:

- price OR purity; (AND) drug OR heroin OR cocaine OR amphetamine OR methamphetamine; (AND) overdose OR ambulance OR emergency OR hospital OR property OR violent OR crime; (AND) effect* OR impact* OR relationship)
- (NOT) pharma* OR medic*

Second, we manually searched for grey literature via the websites of the International Society for the Study of Drug Policy, National Drug Law Enforcement Research Fund, European Monitoring Centre for Drugs and Drug Addiction and RAND Corporation. Third, we used Google Scholar to identify relevant studies that had cited those identified in the first two stages. Finally, three international experts were consulted to identify other relevant studies. The search resulted in identification of 1,988 records, all of which were screened for inclusion. This screening process resulted in 85 full-text articles that were assessed for eligibility and 36 that were included in the analysis (Figure 1).

Figure 1: Search results



Study selection

Inclusion and exclusion criteria were developed with a focus on including empirical, quantitative studies related to drug prices, purity and at least one of the population level harms specified above. The searches were limited to studies examining heroin, cocaine and meth/amphetamine and excluded studies examining cannabis or other drugs. Only studies published in the English language between 1990 and March 2019 (when the searches were conducted) were included. Opinion pieces, commentaries and qualitative studies were also excluded.

Literature was excluded if it examined drug price or purity in the absence of any focus on harm—for example, studies focusing on the price elasticity of demand or the relationship between price, purity and drug consumption. The focus on harms meant that this review was intrinsically biased towards impacts from heavy use rather than occasional use, but this was consistent with our research questions. Harm is also the outcome of most concern to policymakers (Dave 2006).

Data extraction and synthesis

A data extraction spreadsheet was used to ensure that consistent information was coded from each study, including:

- study description—authors, title, journal/source, publication year, study aim, drug type(s), drug form(s);
- context—location, time period of analysis, other;
- methods—study design, data source for price and purity information, PAP (yes/no), data source for outcome(s);
- price and purity—trends in raw price, raw purity and PAP;
- effect—nature of relationship between PAP and drug-related harm (inverse, direct, mixed, null);
- impact on drug-related harms—impact on ambulance attendances, ED visits, hospital admissions, treatment admissions, fatal and non-fatal overdose, property crime, violent crime, drug possession and supply offences (increased, reduced, mixed, null); and quantitative effect size; and
- other—key findings/implications, moderators/mediators.

This spreadsheet (available at <https://ndarc.med.unsw.edu.au/project/relationship-between-price-purity-and-population-level-drug-related-harm>) became the basis for data analysis and synthesis, with referral back to the original articles as required.

Results

Study characteristics

Of the 36 included studies, 47 percent were from North America (1 from Canada and 16 from the United States), with a further 42 percent from Australasia (all from Australia) and 11 percent from Europe (including the United Kingdom, Netherlands, Austria and Turkey; Table 1). Most studies (67%) focused on heroin. The main data source was law enforcement seizures and 36 percent used data from the US System To Retrieve Information from Drug Evidence (STRIDE) or STARLIMS, which replaced STRIDE in October 2014. Since 1973 these systems have provided transaction level data on undercover buys including the date, city, price, quantity and purity of each buy (for details see Caulkins 1994). A further 22 percent used other law enforcement data systems, and one used drug checking data. Across the entire sample, only 47 percent of studies employed PAP.

As outlined in Table 1, there were two main study types—analyses of specific supply events (eg the Australian heroin shortage) and non-event analyses focusing on PAP trends over time. These differed significantly in method, quality, breadth and location, and hence warranted separate analyses. Compared to the event studies ($n=18$), the non-event analyses ($n=18$) employed more rigorous study designs (econometrics, quasi-experimental or time-series) and were more likely to use PAP (78% vs 17%). They also assessed relationships across a broader set of drug types and contexts. Event studies tended to assume changes in price and purity based on third-party data, and seldom included price/purity/PAP data in their analyses.

Table 1: Characteristics of included studies ($n=36$)

	All studies ($n=36$)		Non-event studies ($n=18$)		Event studies ($n=18$)	
	n	%	n	%	n	%
Publication year						
1995–1999	4	11	4	22	0	0
2000–2005	16	44	3	17	13	72
2006–2010	10	28	6	33	4	22
2011–2019	6	17	5	28	1	6
Continent						
North America	17	47	10	56	7	39
Australasia	15	42	4	22	11	61
Europe	4	11	4	22	0	0
Study design						
Descriptive	3	8	0	0	3	17
Correlational/econometric	12	33	11	61	1	5
Quasi-experimental/time-series	21	58	7	39	14	78
Drug type^a						
Heroin	24	67	13	72	11	61
Meth/amphetamine	9	25	2	11	7	39
Cocaine	8	22	8	44	0	0
Data source for price and purity^a						
Law enforcement—STRIDE/ STARLIMS	13	36	10	56	3	17
Law enforcement—other	8	22	7	39	1	5
Consumer reports	9	25	4	22	5	28
Expert reports	2	6	0	0	2	11
Drug checking service	1	3	1	5	0	0
No price or purity data presented ^b	9	25	0	0	9	50
Employs PAP	17	47	14	78	3	17

Table 1: Characteristics of included studies (n=36) (cont.)

	All studies (n=36)		Non-event studies (n=18)		Event studies (n=18)	
	n	%	n	%	n	%
Health outcomes examined^a						
Fatal or non-fatal overdose	12	33	7	39	5	28
Hospital admissions	8	22	5	28	3	17
Emergency department admissions	6	17	5	28	1	6
Ambulance attendance	4	11	1	6	3	17
Treatment outcomes examined^a	13	36	4	22	9	50
Crime outcomes examined^a						
Drug possession and supply offences	8	22	3	17	5	28
Property offences	7	19	1	6	6	33
Violent offences	2	6	1	6	1	6

a: Categories and sub-categories of health, treatment and crime outcomes are not mutually exclusive

b: Event-oriented studies that did not include price or purity data but relied on other studies for context

Findings from non-event studies examining trends over time

Health outcomes

Five US studies examined the relationship between price, purity and PAP and ED admissions. All except one (which did not employ PAP: Zhu et al. (2014)) found an inverse relationship between PAP and ED admissions (Table A1). This means an increase in PAP was associated with a reduction in ED admissions. For example, Dave (2006) found a 10 percent increase in PAP prevented 10,723 cocaine- and heroin-related ED visits, with cost savings of \$21m to \$47m. In one study the inverse relationship meant a reduction in PAP was associated with an increase in ED admissions: Davies (2010) found a nine percent reduction in average cocaine purity led to 399 more ED admissions per 100,000 population. Davies found that the level of variance in purity also shapes health outcomes, as higher variation in cocaine purity was associated with lower ED admissions. Importantly, Caulkins (2001) found trends in PAP accounted for 95 to 98 percent of variation in US ED admissions for cocaine and heroin. This shows PAP can be a very strong predictor of this health-related harm.

Three studies examined relationships between PAP and hospital admissions, and all identified that reductions in heroin and cocaine PAP were associated with increased hospital admissions for those drugs (an inverse relationship). For example, Ciccarone et al. (2016) found that reductions in heroin PAP contributed to a doubling in the rate of US hospitalisations for heroin-related skin and soft tissue infection (SSTI) admissions. They further concluded that each \$100 increase in the yearly average price per gram of pure heroin could be associated with a three percent decrease in the rate of heroin-related SSTI admissions. Ciccarone et al. (2016) also found the source and form of heroin influenced hospital admissions, as cities where Mexican black tar heroin dominated (eg San Diego and Seattle) had twice the rate of SSTI admissions as cities where Colombian powder heroin dominated (eg Chicago and New York).

A Dutch study by Brunt et al. (2010) examining hospital admissions over a 17-year period found a strong inverse relationship between PAP and cocaine-related harm: as cocaine PAP fell, hospital admissions for cocaine increased. But this same study also found changes in amphetamine PAP were not associated with changes in hospital admissions for amphetamines. As such we note that relationships between PAP and hospital admissions may vary by form, source and drug type.

Eight studies looked at the relationship between PAP and fatal or non-fatal overdoses, with seven showing an inverse relationship. The only one that did not find an inverse relationship was one that did not adjust prices for purity (Toprak & Cetin 2009). In Australia Moore et al. (2005) found that every 10 percent increase in heroin PAP was associated with an 11 percent decrease in the number of ambulance calls for non-fatal heroin overdoses, and Darke et al. (1999) found a similar relationship between PAP and fatal heroin overdoses. Darke et al. (1999) and Davies (2010) both found that the range of heroin purity was an independent predictor of the number of fatalities per fortnight. Hyatt and Rhodes (1995) found significant declines in cocaine PAP contributed to a rise in cocaine-related fatalities in the United States, a finding that was reproduced by Schifano and Corkery (2008) in the United Kingdom for cocaine and crack cocaine. Finally, Unick et al. (2014) found that street price, independent of purity, was not associated with heroin overdose, but there was a moderate inverse relationship between heroin PAP and heroin overdose ($r=-0.17$). Specifically, each \$100 increase in the price per gram of pure heroin resulted in a three percent decrease in the number of heroin overdose hospitalisations. Moreover, the reduction in heroin PAP in the US market—from an average PAP of US\$1,368 per gram in 1993 to US\$688 in 2008—accounted for a 20 percent increase in heroin overdose hospitalisations.

Treatment outcomes

Four studies examined impacts on treatment admissions, with variable findings (see Table A2). Brunt et al. (2010) found an inverse relationship between PAP and treatment admissions for both cocaine and amphetamines (as PAP reduced, treatment admissions rose), with that relationship strongest for cocaine. Bach and Lantos (1999) found an inverse relationship, namely that as heroin PAP decreased, the doses of opioid agonists used in treatment increased. In contrast, Weatherburn and Lind (1997) found no relationship between heroin PAP and treatment admissions, a finding echoed by Schifano and Corkery (2008) for cocaine and crack cocaine looking at price and purity separately (not PAP). The variability across studies is consistent with economic theory about the large number of factors that may affect treatment admissions. While some studies noted differences in the quality of treatment offered (Bach & Lantos 1999), none assessed the ease of access to treatment, which other research has shown can vary significantly (Ritter, Chalmers & Gomez 2019; Ritter et al. 2019).

Crime outcomes

Three studies examined impacts on crime, and all found an inverse relationship between PAP and crime (see Table A3). For example, in the United Kingdom, Schifano and Corkery (2008) found reduced price (not adjusted for purity) was associated with increased cocaine and crack cocaine offences. The most notable study to test the relationship between PAP and crime was a US study by DeSimone (2001) that analysed impacts on seven types of crime: murder and manslaughter, forcible rape, aggravated assault, robbery, burglary, larceny, and motor vehicle theft. They observed an inverse relationship (increased PAP, decreased crime) for all offences except for aggravated assault, which had no relationship, and that the strength of the relationship further differed across the other six offence types. DeSimone (2001) demonstrated that the US decline in cocaine PAP in the 1980s increased violent and property crime substantially. For example, the average sample price fell from US\$192 in 1984 to US\$69 in 1989, which predicted increases of 52 percent for vehicle theft, 46 percent for murder, 32 percent for robbery and 17 percent for rape. One limitation is that all studies looked at cocaine specifically, which leaves unanswered the question of whether relationships between PAP and crime differ by drug type.

Findings from event studies

Australian heroin shortage

Out of the 17 event studies, 11 examined the Australian heroin shortage of early 2001, when there was a sudden and dramatic reduction in the availability of heroin in Australia and an accompanying change in the retail price and purity of heroin. Consumer reports indicated that in 2001 the retail price of heroin increased from \$220 to \$320 per gram in New South Wales and from \$330 to \$450 in Victoria (Day 2004a, 2004b). Prior to 2001, prices had been stable (Mattick, Topp & Degenhardt 2004). Heroin purity in New South Wales declined from 65 percent to 28 percent between March 2000 and June 2001, with similar patterns observed in Victoria, South Australia (Day 2004a) and the Australian Capital Territory (Smithson et al. 2004). All relevant studies examining the outcomes of the heroin shortage are summarised in Table A4.

Notably, only one study (Weatherburn et al. 2003) employed PAP, with the rest either including purity alone or cross-referencing other studies documenting changes in price and purity. This study showed that the price per gram of pure heroin in New South Wales rose by 112 percent between 2000 and 2001, that the rise in PAP was associated with a significant reduction in overdoses (53%), but that impacts on property crime (break and enter and robbery) varied over time, as evidenced by a short-term increase followed by a longer term fall.

Consistent with Weatherburn et al. (2003), the five other studies examining health outcomes (fatal and non-fatal overdoses) also showed an inverse relationship. Specifically, the heroin shortage and the accompanying increase in PAP was associated with a significant reduction in fatal and non-fatal overdoses in New South Wales, Victoria and the Australian Capital Territory (Degenhardt et al. 2005c, 2005d, 2005e; Smithson et al. 2004; Weatherburn et al. 2003). The strength of the relationship was moderated by age, whereby younger age groups experienced greater declines in overdose than older age groups (Degenhardt et al. 2005d).

Again in keeping with Weatherburn et al. (2003), the three other studies that examined impacts on crime found that there was a short-term increase in property offences (including burglary, break-and-enter dwelling and non-dwelling, and robbery with and without a weapon) in the initial period following the shortage (Degenhardt et al. 2005b, 2005e; Smithson et al. 2004). However, the increase was not sustained, and acquisitive crime subsequently decreased in New South Wales, Victoria, South Australia and the Australian Capital Territory (Degenhardt et al. 2005e; Smithson et al. 2004). Geography appeared to moderate the relationship between heroin price and property crime, as the strength of the relationships varied across states (highest in NSW, lowest in SA). This was attributed to variations in the size and characteristics of the heroin markets.

Finally, most studies found an inverse relationship between heroin prices and treatment outcomes, whereby the heroin shortage was associated with declining numbers of people entering pharmacological and non-pharmacological treatment (Degenhardt et al. 2005a, 2005d, 2005e). But Smithson et al. (2004) showed that methadone treatment enrolments initially increased and then declined, a finding that was also observed in Victoria. No relationship was observed in South Australia.

Methamphetamine precursor controls in North America

Six studies examined a series of methamphetamine precursor controls introduced in North America in the 1990s/2000s in response to increasing problems related to methamphetamine use and supply (Callaghan et al. 2009; Nonnemaker, Engelen & Shive 2011). The new regulations sought to control the wholesale supply and retail sale of pseudoephedrine and ephedrine—the primary precursors used in the manufacture of methamphetamine. The US regulations were as follows:

- 1989—the *Chemical Diversion and Trafficking Act* (US) regulated wholesale supply of ephedrine and pseudoephedrine in bulk powder form. Distributors of these chemicals were required to register with the Drug Enforcement Administration and keep records of sales and customers;
- 1995—the *Domestic Chemical Diversion and Control Act* (US) partially regulated wholesale distribution of products containing ephedrine as the only active medicinal ingredient;
- 1996—the *Comprehensive Methamphetamine Control Act* (US) regulated retail sale of products that included ephedrine in combination with other active medicinal ingredients (eg cold medicines);
- 1997—the *Comprehensive Methamphetamine Control Act* (US) regulated wholesale supply of products that included pseudoephedrine, regardless of whether they contained other active medicinal ingredients; and
- 2000—the *California Uniform Controlled Substances Act* regulated retail sale by rescheduling pseudoephedrine so it was only available behind the counter and in restricted quantities (<9 grams; Cunningham & Liu 2008, 2005, 2003; Cunningham, Liu & Callaghan 2009).

The relationships between these precursor controls and price, purity and PAP at the street level were studied by several researchers. Cunningham, Liu and Callaghan (2009) used STRIDE data to show the mean methamphetamine PAP rose sharply, albeit temporarily, after each of the 1989, 1995 and 1997 regulations targeting wholesale supply. In contrast, trends differed for the two regulations targeting retail sale. The methamphetamine PAP changed little after the 1996 regulation (Cunningham, Liu & Callaghan 2009), and fell significantly in California (from US\$83.62 to US\$59.69 per pure gram) after the 2000 regulation (Nonnemaker, Engelen & Shive 2011).

In line with these trends, Cunningham and Liu (2003) found an inverse relationship (increased PAP and reduced drug-related health harms) associated with some but not all reforms. Specifically, they showed that the 1989, 1995 and 1997 regulations targeting wholesale supply resulted in a significant decline of between 35 percent and 71 percent in methamphetamine-related hospital admissions (see also Cunningham & Liu 2008). However, the 1996 regulation targeting retail sales had no effect on admissions, a finding that was echoed by Nonnemaker, Engelen and Shive (2011) following the 2000 reform. Analysis of precursor reforms in Canada also found no inverse relationship in this setting, but this study did not employ PAP (Callaghan et al. 2009).

In relation to crime outcomes, Cunningham and Liu (2005) found that methamphetamine arrests decreased by approximately 31 to 45 percent when the 1989, 1995 and 1997 regulations were implemented, but again these declines were not observed for the 1996 regulation. Finally, Dobkin and Nicosia (2009) found an inverse relationship following the 1995 California precursor controls: an increase in methamphetamine PAP led to a rapid 50 percent reduction in amphetamine-related hospital admissions and felony drug offences and a lagged 35 percent reduction in treatment admissions. But there was no compelling evidence of impacts on property or violent crime and all impacts were temporary—approaching pre-intervention levels within 18 months. This indicates that for precursor controls the type of regulation employed is likely to be a key moderator of impacts on PAP and harm. Cunningham and Liu (2005, 2003) and Callaghan et al. (2009) note relationships may be shaped by the extent to which regulations adequately target the source(s) of supply (which is why wholesale controls may elicit greater desired effects).

Discussion

This study involved a rapid review of existing research on the relationship between price, purity and drug-related harm at the population level, focusing on seven key outcomes and three drug types. Analysis of non-event studies suggests that, with a few exceptions, there is a consistent inverse relationship between price, purity and drug-related harm. That is, increased PAP is associated with lower harm, and reduced PAP is associated with increased harm. All exceptions can be explained by the price series failing to adjust for purity (eg Zhu et al. 2014) or the study's focus on outcomes for which theory predicts effects may differ (eg treatment). In that regard, consistent with economic theory, there were subtle differences in outcomes. We saw the clearest relationship with ED admissions and overdoses, followed by hospital admissions and crime, while there was no clear relationship with treatment.

For event studies the evidence base on the relationship between price, purity and harm was clearly less reliable, with the majority (particularly those on the Australian heroin shortage) relying on known or assumed changes in price and purity rather than empirical PAP data and its association with harms. Nevertheless, these studies also showed that actual or assumed increases in price per pure gram were associated with reductions in health-related harms and treatment admissions. Impacts on crime varied, as exemplified by reductions following some but not all events, or by short-term increases followed by longer term reductions. A further universal finding was that impacts of supply shocks dissipated with time.

Across both event and non-event studies we found only subtle differences in the relationship between PAP and harm for cocaine and heroin (albeit with a slightly stronger relationship for cocaine). There is comparatively little data in this area; hence future research examining relationships by drug type is advised, particularly in relation to methamphetamine. Finally, several moderators of the relationship were identified, including geography, age, variation or range in purity, drug source, drug form and in the case of precursor controls the type of regulation employed. For example, changes in PAP appear more likely to influence harm in larger or more established markets and among young cohorts. Again, more research is needed to understand these moderators.

There are several limitations to the analysis, including the limited pool of studies and quantitative estimates, and the focus on harms alone. Nevertheless, as the first such review it has important implications.

Implications for policy and practice

First, this review shows the value of price and purity data for foreseeing drug market impacts. As noted by Caulkins (2001), the relationship between PAP and ED admissions is very strong, accounting for 95 to 98 percent of trends in ED admissions. That this appears to hold across health and crime harms, multiple drug types and contexts as well as directionality (higher PAP is associated with less harm, and lower PAP is associated with greater harm) provides further evidence of the relationship. In the context of a rapidly evolving drug market and where there is a multiplicity of drug policy options and scarce resources, this is welcome news.

Second, the review reinforces that PAP rather than price or purity alone influences harm. While there can be a strong relationship between PAP and harm, the same harm can have a null or even a counter relationship with price or purity alone (particularly price). Analysis of price alone could thus lead to erroneous conclusions being drawn.

Third, the review brings to light the large variability in the quality of research and underlying data systems on price and purity, including the data source(s) (eg police, consumers or drug checking services), the frequency of data collection, the timeliness of reporting, the ability to match price/purity/PAP with outcomes of interest and the extent to which systems employ PAP.

The predominance of evidence (and high-quality evidence) comes from US studies, as a direct consequence of that country's investment in a PAP system (STRIDE/STARLIMS). Routine investment in PAP has a number of benefits, including improving understanding of the causes of crime trends and demands on health care and criminal justice systems, increasing the ability to foresee future needs, and better informing decisions about optimal policy options to increase PAP or keep PAP high. We conclude that PAP should form part of routine data collection systems—including in Australia. With that in mind, it is important to critically examine the current Australian surveillance and monitoring systems.

Existing Australian systems to monitor drug price, purity and PAP

As of 2020 Australia is fortunate to have several surveillance and monitoring systems that capture information on drug price and purity. These include the Illicit Drug Reporting System, the Ecstasy and Related Drug Reporting System and Drug Use Monitoring in Australia, which gather information on prices paid by people who use drugs, along with their perceptions of drug purity (high, medium, low; see, for example, Karlsson & Burns 2018; Patterson, Sullivan & Bricknell 2019; Peacock et al. 2018). The data gathered on price is deemed relatively reliable and useful. For example, Weatherburn et al. (1995) compared price data from undercover buys with the self-reports of people arrested in possession of heroin in Cabramatta; there were no significant differences between the arrest samples and the undercover buy samples in either price or PAP. (All heroin samples from undercover officers and arrestees were forensically analysed to produce PAP.) But the perceptions of purity gathered by the three existing monitoring programs cannot be matched to price, so PAP cannot be derived from these sources alone.

The Australian Criminal Intelligence Commission's *Illicit drug data report* provides data on prices for illicit drugs, collected from each police service based on information supplied by police conducting undercover buys and police informants (see, for example, ACIC 2019). Purity data are collected from police services and contributing forensic organisations. The limitation here is that analyses vary according to police priorities as well as jurisdictional laws, particularly drug trafficking threshold laws (Hughes et al. 2014). More specifically, with the exception of Victoria Police's Forensic Services Department, which analyses the size and purity of all drug seizures made in that state, most Australian states only analyse the purity of large seizures, and what gets analysed varies across states. For example, New South Wales tests the purity of seizures of a commercial quantity or greater, while South Australia tests the purity of all samples weighing over five grams irrespective of the drug type (Australian Criminal Intelligence Commission 2019). Methamphetamine purity data are thus collected on seizures of over 250 grams in New South Wales, over six grams in the Australian Capital Territory and over five grams in South Australia. Existing systems thus curtail state comparisons and limit data collection on retail-level seizures: the most important data for purity-adjusted price analyses.

There are several avenues to improve future analyses in Australia. First, existing high-quality price and purity data (eg Victoria Police data), either on their own or in concert with self-report price data from people who use drugs, could be better used to produce high-frequency PAP series (see, for example, Caulkins 2007; Caulkins, Rajderkar & Vasudev 2010; Scott et al. 2014). Second, law enforcement purity data gathered in states other than Victoria could be improved by supplementing purity analysis of large seizures with analysis of retail-level seizures, developing consistent measures for forensic testing across states, and/or investing in more undercover buys. Alternative data sources such as pill testing or drug checking could also be considered.

One motivator for improving data collection is the experience of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), which committed to improving the monitoring of illicit drug supply in 2014, most notably by collecting data on price and purity. By 2017, 27 countries reported retail purity, and many also reported wholesale purity. The EMCDDA further note that the data collected on purity are ‘consistently valuable for the strategic analysis of the European drug market’ (EMCDDA & Europol 2018: 11). We similarly argue that improving Australian price and purity analysis (and routinely measuring PAP) will increase our capacity to understand the Australian drug market, to address key unknowns (such as the extent to which increasing methamphetamine PAP in Australia would reduce methamphetamine-related crime) and to identify new avenues to reduce drug-related harm.

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Appendix

Table A1: Key findings from non-event analyses of the relationship between price, purity and drug-related harm: Health outcomes

Study	Jurisdiction	Drug type	Outcome examined	Purity-adjusted price (PAP)?	Relationship between PAP (or raw purity) and harm	Impacts on drug-related harm	Other
Emergency department admissions							
Hyatt & Rhodes (1995)	USA	Cocaine	ED admissions	Yes	Inverse	As PAP decreased, ED admissions increased.	Significant relationship observed.
		Cocaine	ED admissions	Yes	Inverse	As PAP decreased, ED admissions increased.	Same pattern for both cocaine and heroin, but correlation between actual and expected ED admissions was 0.987 for cocaine and 0.975 for heroin. That is, price changes explained 97.5% of variation in ED admissions for cocaine and 95% of variation for heroin, with price elasticities of demand being estimated at -1.30 and -0.84 , respectively.
Caulkins (2001)		Heroin	ED admissions	Yes	Inverse	As PAP decreased, ED admissions increased.	The elasticity of the probability of an ED admission was -0.27 for cocaine and -0.10 for heroin. This implied that a 10% increase in PAP could prevent 10,723 cocaine and heroin-related ED visits, with cost savings of between \$21m and \$47m.
Dave (2006)	USA	Cocaine	ED admissions	Yes	Inverse	As PAP increased, ED admissions fell.	
		Heroin	ED admissions	Yes	Inverse	As PAP increased, ED admissions fell.	

Table A1: Key findings from non-event analyses of the relationship between price, purity and drug-related harm: Health outcomes (cont.)

Study	Jurisdiction	Drug type	Outcome examined	Purity-adjusted price (PAP)?	Relationship between PAP (or raw purity) and harm	Impacts on drug-related harm	Other
Davies (2010)	USA	Cocaine	ED admissions	Yes	Inverse	Higher average purity, higher coefficient of variance and higher skewness (ie longer tail in higher purities) associated with lower ED admissions.	During the 1990s, average cocaine purity fell by 9.3 percentage points. This translated into 399 more ED admissions per 100,000, a 7.6% increase relative to the sample mean.
		Heroin	ED admissions	Yes	Inverse	Lower coefficient of variance and lower skewness (but not lower average purity) associated with higher ED admissions.	The decline in heroin purity skewness of 0.56 in the 1990s (ie reduction in uncertainty in purity) translated into 766 more ED admissions, a rise of 31% relative to the mean.
Zhu et al. (2014)	USA	Cocaine	ED admissions	No (purity only)	Direct	As purity fell, ED visits fell.	
		Crack Cocaine	ED admissions	No (price only)	Null	No significant price relationship.	

Table A1: Key findings from non-event analyses of the relationship between price, purity and drug-related harm: Health outcomes (cont.)

Study	Jurisdiction	Drug type	Outcome examined	Purity-adjusted price (PAP)?	Relationship between PAP (or raw purity) and harm	Impacts on drug-related harm	Other
Hospital admissions							
Brunt et al. (2010)	Netherlands	Amphetamine	Hospital admissions	Yes	Null	Neither purity nor PAP had a significant impact on hospital admissions.	Important differences observed by drug type, with strong negative correlation for cocaine PAP and purity but not amphetamine.
		Cocaine	Hospital admissions	Yes	Inverse	As PAP and price fell, health admissions increased.	Amphetamines: PAP $\beta = -0.170$ Purity $\beta = 0.0522$ Cocaine: PAP $\beta = -0.385^*$ Purity $\beta = -1.509^*$
Ciccarone et al. (2016)	USA	Heroin	Hospital admissions for skin and soft-tissue infections	Yes	Inverse	As PAP fell, hospital admissions rose.	Heroin market features were strongly associated with changes in the rate of SSTI. Each \$100 increase in yearly average price per gram of pure heroin was associated with a 3% decrease in the rate of heroin-related SSTI admissions.
		Methamphetamine	Hospital admissions	Yes	Inverse	As PAP fell, hospital admissions rose.	
Scott et al. (2014)	Australia	Heroin	Hospital admissions	Yes	Inverse	As PAP fell, hospital admissions rose.	

Table A1: Key findings from non-event analyses of the relationship between price, purity and drug-related harm: Health outcomes (cont.)

Study	Jurisdiction	Drug type	Outcome examined	Purity-adjusted price (PAP)?	Relationship between PAP (or raw purity) and harm	Impacts on drug-related harm	Other
Fatal or non-fatal overdose							
Moore et al. (2005)	Australia	Heroin	Non-fatal overdose	Yes	Inverse	As PAP rose, non-fatal overdoses fell.	Every 10% increase in the PAP of heroin was associated with an 11.2% decrease in the number of ambulance calls for non-fatal heroin overdoses.
Darke et al. (1999)	Australia	Heroin	Fatal overdose	Yes	Inverse	As PAP increased, overdoses fell.	Significant moderate correlation ($r=0.57$) at time lag zero between mean purity of heroin sample per fortnight and number of overdose fatalities. Both mean heroin purity and range of heroin purity were independent predictors of the number of fatalities per fortnight.
Hyatt & Rhodes (1995)	USA	Cocaine	Fatal overdose	Yes	Inverse	As PAP increased, overdoses fell.	
Scott et al. (2014)	Australia	Methamphetamine	Overdose deaths	Yes	Inverse	As PAP fell, overdose deaths increased.	
		Heroin	Overdose deaths	Yes	Inverse	As PAP fell, overdose deaths increased.	

Table A1: Key findings from non-event analyses of the relationship between price, purity and drug-related harm: Health outcomes (cont.)

Study	Jurisdiction	Drug type	Outcome examined	Purity-adjusted price (PAP)?	Relationship between PAP (or raw purity) and harm	Impacts on drug-related harm	Other
Schifano & Corkery (2008)	UK	Cocaine	Cocaine related death	No (price only)	Inverse	As price fell, deaths rose.	The number of cocaine/crack cocaine related deaths (deaths from any cause where the presence of cocaine/crack cocaine was detected) showed a year-on-year increase and was inversely correlated with price. But the strength of relationship differed by form: <ul style="list-style-type: none"> ■ Cocaine: 0.882*** ■ Crack cocaine: -0.569* Concluded price decrease contributed to rise in cocaine-related fatalities.
		Crack cocaine	Crack cocaine related deaths	No (price & purity only)	Inverse	As price & purity fell, deaths rose.	
Toprak & Cetin (2009)	Turkey	Heroin	Overdose deaths	No (purity only)	Null	Null impact of purity on overdoses.	
Rosenblum, Unick & Ciccarone (2017)	USA	Heroin	Overdose admissions to hospital	Yes	Inverse	As PAP fell, admissions rose.	

Table A1: Key findings from non-event analyses of the relationship between price, purity and drug-related harm: Health outcomes (cont.)

Study	Jurisdiction	Drug type	Outcome examined	Purity-adjusted price (PAP)?	Relationship between PAP (or raw purity) and harm	Impacts on drug-related harm	Other
Unick et al. (2014)	USA	Heroin	Overdose admissions to hospital	Yes	Inverse	As PAP increased, overdose admissions fell.	No evidence to support the hypothesis that actual street price of heroin, independent of purity, was associated with overdose. But, each \$100 increase in the price per gram of pure heroin results in a 2.9% decrease in the number of overdose admissions.
Ambulance attendance							
Risser et al. (2007)	USA	Heroin	Ambulance call-outs	No (purity only)	Null	No relationship between purity and ambulance call-outs.	Low quality study.

***statistically significant at $p < 0.001$, *statistically significant at $p < 0.05$

Table A2: Key findings from non-event analyses of the relationship between price, purity and drug-related harm: Treatment outcomes							
Study	Jurisdiction	Drug type	Outcome examined	Purity-adjusted price (PAP)?	Relationship between PAP (or raw purity) and harm	Impacts on drug-related harm	Other
Brunt et al. (2010)	Netherlands	Amphetamine	Treatment admissions	Yes	Inverse	As PAP reduced, treatment admissions rose.	Strong relationship for cocaine and moderate relationship for amphetamines:
		Cocaine	Treatment admissions	Yes	Inverse	As PAP and purity reduced, treatment admissions rose.	Amphetamine: PAP $\beta=-5.811^*$ Purity $\beta=3.101$ Cocaine: PAP $\beta=-6.607^*$ Purity $\beta=-11.679^*$
Weatherburn & Lind (1997)	Australia	Heroin	Methadone treatment admissions	Yes	Null		
Schifano & Corkery (2008)	UK	Cocaine and crack cocaine	Treatment admissions	No (price & purity only)	Null		Significant increase in treatment admissions not accounted for by changes in raw purity or price.

*statistically significant at $p<0.05$

Table A3: Key findings from non-event analyses of the relationship between price, purity and drug-related harm: Crime outcomes

Study	Jurisdiction	Drug type	Outcome examined	Purity-adjusted price (PAP)?	Relationship between PAP (or raw purity) and harm	Impacts on drug-related harm	Other
DiSimone (2001)	USA	Cocaine	Murder and non-negligent manslaughter, forcible rape, aggravated assault, robbery, burglary, larceny, and motor vehicle theft	Yes	Inverse	As price fell, crimes increased. Exception: aggravated assault.	Significant impacts across multiple crime types: Vehicle theft -0.291^{***} Murder -0.261^{***} Robbery -0.179^{***} Burglary -0.163^{***} Rape -0.094^* Larceny -0.072^{**} Aggravated assault -0.067 Implies that price increases resulting from exogenous supply shifts inversely impact both violent and property crime, and that the 1980s price decline increased crime substantially. For example, the average sample price fell from \$192 in 1984 to \$69 in 1989. This 178 percent price drop predicts increases of 52% for vehicle theft, 46% for murder, 32% for robbery, 29% for burglary, 17% for rape, 13% for larceny.

Table A3: Key findings from non-event analyses of the relationship between price, purity and drug-related harm: Crime outcomes (cont.)

Study	Jurisdiction	Drug type	Outcome examined	Purity-adjusted price (PAP)?	Relationship between PAP (or raw purity) and harm	Impacts on drug-related harm	Other
Schifano & Corkery (2008)	UK	Cocaine and crack cocaine	Drug offences	No (price only)	Inverse	As price fell, drug offences rose.	
Hyatt & Rhodes (1995)	USA	Cocaine	% of arrestees testing positive to drugs	Yes	Inverse	As PAP reduced, % of arrestees testing positive increased.	

***statistically significant at $p < 0.001$, **statistically significant at $p < 0.01$, *statistically significant at $p < 0.05$ Table A4: Studies examining the Australian heroin shortage and the relationship between price, purity and drug-related harm^a

Study	Jurisdiction	Outcome examined	Purity-adjusted price (PAP)? ^b	Relationship between PAP and harm	Result—trends in drug-related harm
Health					
Weatherburn et al. (2003)	NSW	Fatal/non-fatal overdose	Yes	Inverse	As PAP rose, fatal overdoses fell by 74%.
Degenhardt et al. (2005c)	NSW	Non-fatal overdose	No	Inverse	As heroin price increased and purity fell, non-fatal overdoses decreased significantly as measured by ambulance call-outs (a 40% decrease from 302.7 to 111.6 ambulance call-outs per month).
	NSW	Fatal overdose	No	Inverse	43% decrease in fatal overdoses, mainly due to change in the number of deaths where heroin was involved. The proportion of deaths in which only heroin was detected decreased from around 25% to 10%.

Table A4: Studies examining the Australian heroin shortage and the relationship between price, purity and drug-related harm^a (cont.)

Study	Jurisdiction	Outcome examined	Purity-adjusted price (PAP) ^b	Relationship between PAP and harm	Result—trends in drug-related harm
Degenhardt et al. (2005d)	NSW	Fatal overdose	No	Inverse	15–24 years: 65% decrease 25–34 years: 39% decrease 35–44 years: 42% decrease Older age groups: no change
	NSW	Fatal overdose	No	Inverse	43% decrease
	SA	Fatal overdose	No	Null	Small number, precluded time-series
	Vic	Fatal overdose	No	Inverse	85% decrease
Smithson et al. (2004)	ACT	Ambulance call-outs	No (purity only)	Direct	As heroin purity fell, ambulance call-outs fell: significant decline from a peak of 55 in December 1999 to an average of 8 between June 2001 and March 2002.
Treatment					
Degenhardt et al. (2005a)	Australia	Treatment entrants	No	Inverse	Mean treatment entrants per month reduced by 29%, from 285 in January 2001 to 123 by April 2001.
Degenhardt et al. (2005e)	NSW	Pharmacology treatment	No	Inverse	Decrease in number of new pharmacology treatment entrants.
	NSW	Non-pharmacology treatment	No	Inverse	Reduction in closed treatment episodes for heroin, particularly among younger age groups.
	SA	Pharmacology treatment	No	Null	No change
	SA	Non-pharmacology treatment	No	Inverse	Reduced demand for treatment, though there was a brief spike in demand in rural areas.
Degenhardt et al. (2005e)	Vic	Pharmacology treatment	No	Mixed	Initial decrease in pharmacology treatment episodes, not sustained.
	Vic	Non-pharmacology treatment	No	Inverse	25% decrease in number of courses of treatment, particularly among 15–24 and 25–34 year olds.

Table A4: Studies examining the Australian heroin shortage and the relationship between price, purity and drug-related harm^a (cont.)

Study	Jurisdiction	Outcome examined	Purity-adjusted price (PAP) ^{a,b}	Relationship between PAP and harm	Result—trends in drug-related harm
Degenhardt et al. (2005d)	NSW	Pharmacology treatment	No	Inverse	15–24 years: 26% decrease in new registrations 25–34 years: 41% decrease in new registrations Older age groups: no significant change
	NSW	Non-pharmacology treatment	No	Inverse	Decreased, more pronounced among younger age groups.
Smithson et al. (2004)	ACT	Methadone treatment entrants	No (purity only)	Mixed	As heroin purity fell, methadone treatment enrolments initially climbed (from around 600 in Jan 1999 to 671 in January 2001), then levelled off at around 640 for the remainder of that year.
Crime					
Weatherburn et al. (2003)	NSW	Property crime	Yes	Mixed	Rise in PAP associated with short-term rise in break-and-enter dwelling and robbery offences, then longer term fall. But the offences returned to 1999 levels by June 2001.
Degenhardt et al. (2005b)	NSW	Property crime	No	Mixed	Robbery without a weapon increased by 33%. Break-and-enter dwelling increased by 14%. Break-and-enter non-dwelling, motor-vehicle theft and stealing remained stable.
	NSW	Heroin use/possession	No	Inverse	45% decrease

Table A4: Studies examining the Australian heroin shortage and the relationship between price, purity and drug-related harm^a (cont.)

Study	Jurisdiction	Outcome examined	Purity-adjusted price (PAP) ^b	Relationship between PAP and harm	Result—trends in drug-related harm
Degenhardt et al. (2005e)	NSW	Property crime	No	Mixed	Short-term increase in robbery with a weapon, then longer term fall.
	NSW	Heroin use/possession	No	Inverse	Decreased, particularly pronounced among men aged 20–29 years.
	SA	Property crime	No	Mixed	Short-term increase in robbery without a weapon, then longer term fall.
	SA	Heroin use/possession	No	Null	No difference attributable to the shortage.
	Vic	Property crime	No	Mixed	Short-term increase in residential burglary, then longer term fall.
Smithson et al. (2004)	Vic	Heroin use/possession	No	Inverse	40% decrease
	ACT	Property crime	No (purity only)	Mixed	As heroin purity fell, robbery and burglary offences initially increased, then declined significantly. For example, burglary fell from 832 in November 1999 to less than half by August 2001. No impact on theft.

a: This table excludes descriptive and basic correlational studies examining the heroin shortage by Day (2004a, 2004b); Longo et al. (2004); and Mattick, Topp & Degenhardt (2004). The studies included in the table used interrupted time-series analyses to examine the impact of the shortage on various outcomes

b: The studies that did not use price, purity or PAP data used the heroin shortage as an intervention point and conducted time-series analyses on outcomes, cross-referencing descriptive studies of the changes in price and purity during the heroin shortage (eg Day 2004a)

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13. The price elasticity of demand for illicit drugs: A systematic review

Jason Payne, Matthew Manning, Christopher Fleming and Hien-Thuc Pham

Australia's National Drug Strategy 2017–2026 is the most recent iteration in a long history of drug policy development, and commits Australia to three pillars of harm minimisation: demand reduction, supply reduction and harm reduction (Department of Health 2017). Although nationally coordinated by the Department of Health, both Commonwealth and state and territory law enforcement agencies play a key role across all three pillars. Annually, law enforcement expenditure accounts for an estimated 66 percent of all spending on drug policy (Shanahan & Ritter 2013), but it is the heavy investment in supply reduction that has received the greatest scrutiny.

Supply reduction encompasses myriad domestic and international activities whose primary goal is to reduce the availability of illicit drugs. On an international scale, there are numerous bilateral and multilateral cooperative agreements through which intelligence gathering and interdiction operations seek to disrupt international trafficking from primary production and secondary source countries. In this context, Australia's geographical position is an advantage, as it does not share a porous border with any of the large production sites in Latin America or South-East Asia.

Domestically, illicit drug supply reduction activities range from immigration, customs and border control initiatives to local-level policing strategies, each with the objective of reducing street-level supply by dismantling local production capabilities and disrupting internal distribution networks. These law enforcement activities seek not only to lessen the overall availability of illicit drugs (and reduce the opportunities for drug use) but also to manipulate aggregate and individual-level demand for drugs through market mechanisms such as an increase in price. As highlighted by Chalmers, Bradford and Jones (2009), supply side law enforcement is often justified on the assumption that by increasing the risks associated with production, transportation and trade, suppliers will be forced to compensate for these risks by increasing the price of their product or reducing purity. The work of Caulkins and Reuter (1998, 1996) and Reuter and Kleiman (1986) is particularly useful here because they highlight the challenging and sometimes unpredictable dynamics of drug pricing in the context of different law enforcement scenarios.

The extent to which the demand for a product is influenced by its price is known in economics as the price elasticity of demand. The demand for a product is defined as price elastic if the proportional change in quantity demanded is greater than the proportional change in price. For example, if the quantity demanded falls by more than 10 percent in response to a 10 percent price increase, demand would be considered elastic. Conversely, the demand for a product is defined as price inelastic if the proportional change in quantity demanded is smaller than the proportional change in price. For mathematical completeness, unit elasticity is the case where the proportional change in quantity demanded is equal to the proportional change in price. Demand is considered perfectly inelastic if the coefficient of elasticity is 0, perfectly elastic if the coefficient of elasticity is -1 , inelastic if the coefficient is between -1 and 0, and elastic if the coefficient is less than -1 .

In the context of the price elasticity of demand for illicit drugs, it is important to be clear about what is being estimated. As noted by Saffer and Chaloupka (1999), drug consumption survey data typically have a large number of observations with a value of zero, which causes econometric problems. Because of this, three different drug consumption concepts are commonly defined:

- *participation*—a dichotomous variable indicating whether an individual is or is not using drugs, yielding a concept known as participation elasticity (ie how levels of drug use participation respond to changing prices).
- *use given participation*—a continuous measure of quantity of consumption but only for individuals who participate, yielding the most common measure of price elasticity of demand found in the literature—and the concept of price elasticity of demand that is the focus of this study.
- *use regardless of participation*—a continuous measure of consumption for all individuals within a defined population, regardless of whether or not an individual uses drugs at all. This measure of price elasticity of demand is seldom used as population-wide survey data of drug use is rare and the aforementioned large number of zeros cause estimation problems.

A key to understanding the likely effectiveness of efforts to reduce the supply of illicit drugs is the relative sensitivity and responsiveness of its users to an increase in price. This question is especially important because a number of law enforcement strategies have produced mixed results and in some cases unintended consequences. Mazerolle, Soole and Rombouts (2007) explore the research evidence on a series of market-level policing strategies, including ‘crackdowns’ (Davis & Lurigio 1996), ‘police raids’ (Cohen, Gorr & Singh 2003), ‘undercover or covert operations’ (Williams et al. 2001), ‘search and seizure’ (Pollack & Reuter 2014) and ‘high intensity policing’ activities (Piza 2018). In each case, the evidence was insufficient to establish an association between the strategy and a subsequent reduction in the size of local drug markets.

The evidence on unintended consequences is much stronger. For example, research has shown that many of the aforementioned supply reduction strategies risk temporal and geographical displacement (moving crime to other times or places), negative impacts on local patterns of drug use and purchase, an increase in unsafe injecting practices and a decrease in the demand for treatment (Aitken et al. 2002; Kerr, Small & Wood 2005; Volkmann et al. 2011; Wood et al. 2004).

To inform policymakers about the responsiveness of drug demand to an increase in price, this study conducts a systematic review of research on the price elasticity of demand for illicit drugs. Market adjustments can manifest as changes in the purity of drugs at a given price (Caulkins 2007). Therefore, price elasticity of demand should be interpreted alongside purity analysis. Ideally, a purity-adjusted price should be used when estimating elasticity of demand. However, purity-adjusted prices can be difficult to obtain, so researchers employ a range of strategies to control for the purity of drugs in their estimation of demand. These strategies are discussed in more detail below.

Method and data

This systematic review consolidates contemporary economic, drug policy and criminal justice literature in an attempt to quantify how demand for drugs responds to changes in drug price. There have been two systematic reviews previously conducted on the price elasticity of demand for illicit drugs: Gallet (2014) and Pacula and Lundberg (2014).

Gallet (2014) examines 42 studies which together made 462 separate observations. The author highlights that a number of characteristics influence the estimate of elasticity, including drug type, whether demand is modelled in the short- or long-run, the unit of measurement for quantity and price, whether alcohol and other illicit drugs are included in the specification of demand, and location. Characteristics that have little influence on price elasticity of demand include the functional form of the demand equation (ie whether the relationship between price and quantity demanded is linear or logarithmic), the type of data and method used to estimate demand, and the quality of the publication.

Focusing solely on marijuana use, Pacula and Lundberg (2014) assess how consumption changes in response to changes to price and enforcement risk, explicitly considering how this responsiveness varies among different user groups. The authors conclude that it is clear that the demand for marijuana is responsive to changes in both its monetary price and the non-pecuniary aspects of price, particularly those pertaining to legal risk. However, the responsiveness of demand depends on the type of change (price change versus criminal status change) and the type of user (light, casual, regular or heavy). With regard to changes in price, the authors report that for every 10 percent decline in price, there will be an increase of three to five percent in the number of new marijuana users aged under 18, an increase of 2.5 percent in the number of regular users, and an increase in the duration of marijuana use during adulthood.

Search strategy and study selection

Methodologically we opted to update these existing reviews with additional research material published between 2010 and June 2019. To systematise this, we searched for keywords across six separate databases: Scopus, Web of Science, Criminal Justice Abstracts, PsycInfo, EconLit and Google Scholar. We were interested in four types of illicit drugs, including marijuana/cannabis, cocaine, heroin and methamphetamine. Thus, our search terms were as follows:

drug OR marijuana OR cannabis OR cocaine OR heroin OR methamphetamine OR amphetamine*

AND price OR demand OR elasticity

AND NOT medic AND NOT pharma**

We limited our search to peer-reviewed journal articles published in English. This initial search yielded 1,157 studies. After title screening, a sub-sample of 474 studies were retained as being relevant to illicit drugs and illicit drug markets. Of these 474 studies, 14 studies not reviewed by either Gallet (2014) or Pacula and Lundberg (2014) included specific analysis of price elasticities, and 12 of these studies estimated the price elasticity of demand for illicit drugs. A PRISMA diagram illustrating the search process is provided in the *Appendix* (Figure A1).

The illegal nature of illicit drugs makes studying the price elasticity of demand difficult; as such, most studies rely on survey data or data gathered via behavioural economic experiments. In surveys, respondents typically self-report their level of use over the last 12 months or 30 days. Consumption is treated as a binary variable, coded '1' if the individual uses a drug and '0' otherwise. These studies examine the impact of price on the decision to use drugs and report participation elasticity rather than the price elasticity of demand.

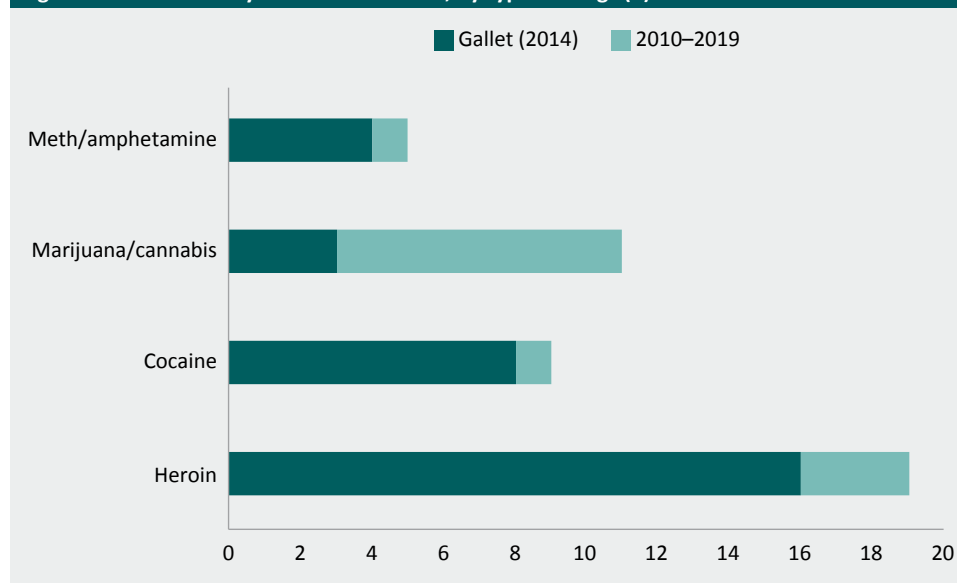
With experimental data, drug users respond to a series of hypothetical price changes, indicating whether or not they would use and, if they decided to use, how much they would use. From this data the impact of a (hypothetical) change in price on quantity consumed (ie price elasticity of demand) can be estimated (see, for example, Aston et al. 2016; Collins et al. 2014; and Olmstead et al. 2015). A further source of data from which price elasticity of demand can be estimated is crowdsourced data on actual transactions, including data on price, quantity traded and possibly quality (see, for example, Davis, Geisler & Nichols 2016). These data, however, are subjective and based on unqualified user reports. They are therefore not suitable for estimating price elasticity of demand.

As noted above, we focus solely on price elasticity of demand, treating consumption as a continuous scale. The argument for not including participation elasticity is that this measure does not take into account the price responsiveness of regular or heavy users, who, according to data from the 2001 National Household Survey on Drug Abuse, account for 71 percent of total drug purchases (Caulkins & Pacula 2006). We identified 35 studies (23 identified by Gallet (2014) and 12 more recent studies) that estimate price elasticity of demand (Table 1). Several studies report multiple estimates of price elasticity, depending on empirical specification. In Table 1 we report the median estimate from each study for each drug type. This approach is consistent with that of Gallet (2014). The advantage of using the median (as opposed to the mean) is that the median is less affected by outliers and a skewed distribution, particularly when the number of elasticity estimates in each study is small. Unlike Gallet (2014), we exclude elasticity estimates for suppliers from the median calculation because suppliers are not representative of drug users.

Results

Figures 1 and 2 present the number of studies classified by drug type and location. As shown in Figure 1, a large number of studies focus on the price elasticity of demand for heroin. More recent research effort has been devoted to estimating the responsiveness of marijuana consumption to changes in price. Although no studies focus exclusively on methamphetamine, five of the nine studies that estimate price elasticity of demand for a number of drugs include methamphetamine or amphetamine-type substances. As shown in Figure 2, the majority of studies were conducted in the United States, Norway and Australia, with one recent study conducted in South Africa.

Figure 1: Price elasticity of demand studies, by type of drugs (*n*)



Note: Some studies examine multiple drug types; therefore the categories are not mutually exclusive and the total number of studies in this figure exceeds 35

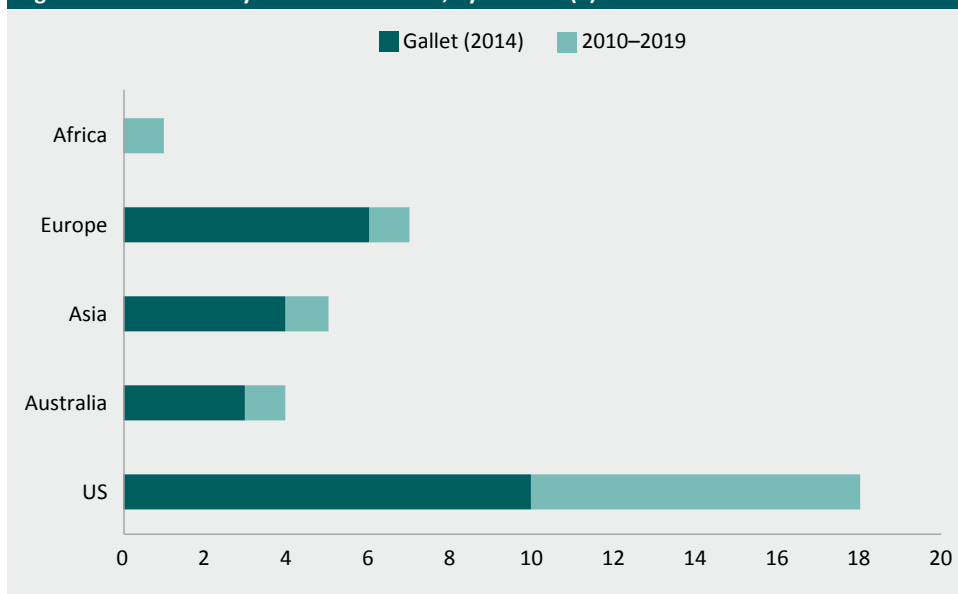
Figure 2: Price elasticity of demand studies, by location (n)

Table 1 reports the median price elasticity of demand from each study by drug type. This yields 44 median elasticities of demand for illicit drugs. Taking the average of these 44 yields a mean elasticity of demand for all drugs of approximately -0.9 , indicating that demand for illicit drugs is inelastic—that is, the quantity demanded is not very sensitive to changes in price. In other words, a 10 percent increase in price would reduce the quantity demanded by approximately nine percent. This estimate is different to the figure of -0.33 reported by Gallet (2014), because Gallet (2014) combined both participation elasticity and elasticity of demand. Approximately half of the studies cited in Gallet (2014) focus on participation elasticity, which is typically lower than the price elasticity of demand. Pacula and Lundberg (2014) report participation elasticities ranging from -0.002 to -0.69 .

Table 1: Overview of studies on price elasticity of demand for illicit drugs

Study ^a	Drug type	Country	Experimental data	Median price elasticity of demand			
				Heroin (H)	Cocaine (C)	Marijuana (M)	Meth/amphetamine (A)
Nisbet & Vakil (1972)	M	US	Yes			-0.30	
Caulkins (1995)	C, H	US		-0.30	-0.36		
van Ours (1995)	H	Indonesia		-0.85			
Bretteville-Jensen & Sutton (1996)	H	Norway		-1.23			
Crane, Rivolo & Comfort (1997)	C	US			-0.49		
Grossman & Chaloupka (1998)	C	US			-0.37		
Petry & Bickel (1998)	H	US		-1.06			

Table 1: Overview of studies on price elasticity of demand for illicit drugs (cont.)

Study ^a	Drug type	Country	Experimental data	Median price elasticity of demand			
				Heroin (H)	Cocaine (C)	Marijuana (M)	Meth/amphetamine (A)
Bretteville-Jensen (1999)	H	Norway		−1.51			
Chaloupka, Grossman & Tauras (1999)	C	US			−0.45		
Liu et al. (1999)	H	Taiwan		−0.93			
Caulkins (2001)	C, H	US		−0.84	−1.30		
Petry (2001)	C	US	Yes		−1.15		
van Luijk & van Ours (2001)	H	Indonesia		−0.22			
Bretteville-Jensen & Bjørn (2003)	H	Norway		−0.91			
Bretteville-Jensen & Bjørn (2004)	H, A	Norway		−0.99			−0.22
Sumnall et al. (2004)	C, A	UK			−2.44		−2.21
Clements & Daryal (2005)	M	Australia				−0.69	
Bretteville-Jensen (2006)	H	Norway		−0.77			
Chandra & Swoboda (2008)	M, H	India		−0.70		−0.33	
Jofre-Bonet & Petry (2008)	C, H	US	Yes	−0.90	−0.90		
Chalmers, Bradford & Jones (2009)	A, H	Australia	Yes	−2.11			−1.82
Roddy & Greenwald (2009)	H	US		−0.64			
Chalmers, Bradford & Jones (2010)	A, H	Australia	Yes	−1.73			−1.66
Clements, Lan & Zhou (2010)	M	Australia				−0.65	
Collins et al. (2014)	M	US	Yes			−1.75	
Olmstead et al. (2015)	H	US		−0.80			
Chandra & Chandra (2015)	H	India		−0.34			
Lakhdar, Vaillant & Wolff (2016)	M	France				−1.90	

Table 1: Overview of studies on price elasticity of demand for illicit drugs (cont.)

Study ^a	Drug type	Country	Experimental data	Median price elasticity of demand			
				Heroin (H)	Cocaine (C)	Marijuana (M)	Meth/amphetamine (A)
Davis, Geisler & Nichols (2016)	M	US				−0.73	
Aston et al. (2016)	M	US				−0.05	
Halcoussis, Lowenberg & Roof (2017)	M	US				−0.42	
Thompson & Koichi (2017)	C, A	US			−0.10		0.51
Vincent et al. (2017)	M	US	Yes			−1.37	
Vitaliano (2018)	H	US		−1.00			
Riley, Vellios & van Walbeek (2019)	M	South Africa				−0.55	
Average (mean)				−0.94	−0.84	−0.79	−1.08

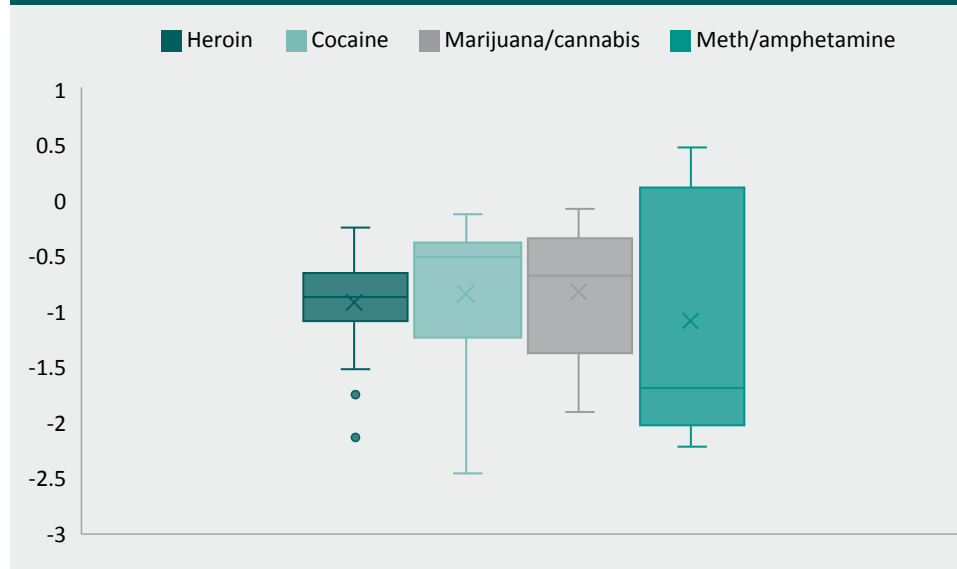
a: Full citations for these studies are provided in the *Appendix*, Table A1

Types of drugs

The average price elasticities of heroin, cocaine, marijuana and methamphetamine in our study are −0.9, −0.84, −0.79 and −1.08 respectively. Consistent with Gallet (2014), among the illicit drug types, demand for marijuana is the least price-sensitive. A study by Chandra and Swoboda (2008) also shows that marijuana use is less responsive to price change than heroin use. As marijuana is considered a ‘soft drug’, while heroin and cocaine are ‘hard drugs’ and more susceptible to drug dependency, at first glance this result appears counterintuitive. However, Gallet (2014) argues that a typical hard drug user would have more experience in the illicit drug market, and more information about drug prices and the availability of substitutes.

Figure 3 reveals the range of estimates of price elasticity of demand for heroin, cocaine, marijuana and methamphetamine. Methamphetamine has the largest variation, ranging from −1.82 to 0.51. Only Thompson and Koichi (2017) report a positive median price elasticity of demand for any drug—0.51 for methamphetamine. This suggests that methamphetamine may be a Giffen good (a product for which demand increases as price increases and demand falls when price falls), although the authors do not use purity-adjusted price for their elasticity estimates.

Figure 3: Price elasticity of demand, by type of illicit drug



Purity and quality of drugs

Thompson and Koichi (2017) argue that the positive elasticity for methamphetamine may be due to an increase in the quality of methamphetamine. Using Australian data, Scott, Caulkins, Ritter and Dietze (2015) also find that the price of and demand for methamphetamine has increased, a paradox that can be solved when purity is taken into account. Further evidence of the relationship between drug purity and price elasticity of demand is provided by Vincent et al. (2017), who find that demand for low grade marijuana is more price elastic (-1.97) than demand for higher grade marijuana (-1.11).

Ideally, to estimate price elasticity of demand, purity-adjusted price should be used. According to Bretteville-Jensen and Biørn (2004), police seizures show large variation in heroin and amphetamine purity at the wholesale level but little variation at the retail level. However, the purity is often unknown to the users at the time of purchase, so actual purity-adjusted prices may not be that important. What matters to demand is the perceived quality at the time of purchase rather than the actual quality. Researchers employ several techniques to control for drug quality when estimating the relationship between price and demand and their corresponding elasticities. For example, Bretteville-Jensen (2006) employs drug prices reported by participants and adjusted for decreases in heroin purity registered at the import level since 2000, whereas Olmstead et al. (2015) estimate elasticity of demand for high- and low-quality heroin separately. In the context of cannabis, Lakhdar, Vaillant and Wolff (2016) include both perceived quality and actual potency (based on the concentration of tetrahydrocannabinol) as control variables in their demand function regression.

Geographical differences

Price elasticity of demand appears to be country-specific. Table 1 shows that the average price elasticity of demand for heroin in the United States is -0.79 , while in Australia and Norway it is -1.92 and -1.08 respectively. This implies that US heroin users tend to be less sensitive to price changes than either Australian or Norwegian users.

Among studies that investigate price elasticity of demand for heroin, Olmstead et al. (2015) employ an innovative dataset that combines longitudinal data collected daily from 120 US regular heroin users and experimental data. The authors employ two empirical strategies to estimate price elasticity of demand. The first strategy is to examine the longitudinal pattern of drug purchasing, exploiting the within-individual idiosyncratic variation in price. The second strategy uses experimental data and exploits an experimentally induced variation in price. Both strategies yield an estimated price elasticity of demand of -0.8 . This estimate is consistent with the average of the other US-based heroin studies (-0.79). While there is a sizeable difference in heroin price elasticity between the US and Australian markets, average elasticities for marijuana are similar (-0.77 vs. -0.67).

With regard to cocaine, most studies in the US market report inelastic demand (elasticities are negative and less than one in absolute value), with the exception of Caulkins (2001) and Petry (2001). Our review identified one additional UK-based study, which estimates the price elasticity of demand for cocaine (-2.44) and for amphetamine (-2.21 ; Sumnall et al. 2004). Thus, while demand for cocaine in the United States appears to be inelastic, the limited available evidence from the United Kingdom suggests a higher price elasticity of demand.

User effects

According to Pacula and Lundberg (2014), different types of drug users respond differently to changes in price. Four groups of users are identified: initiators and light users, regular users, heavy users, and quitters. For marijuana, initiation among youth is sensitive to changes in price, with initiation (or participation) elasticity ranging from -0.002 to -0.69 . With regard to regular marijuana users, Nisbet and Vakil's (1972) study, albeit dated, estimated the elasticity of demand (capturing the change in consumption among those already using marijuana) to be approximately -0.3 . The participation elasticity of this group is approximately -0.7 to -1.0 , resulting in a total elasticity of demand ranging from -1.01 to -1.51 .

Clements and Zhao (2009), as cited in Pacula and Lundberg (2014), estimate elasticity for regular users as -0.4 . Aston et al. (2016) report elasticity of demand among frequent marijuana users as -0.04 (whole sample), -0.055 (users without symptoms of dependence) and -0.038 (users with symptoms of dependence). There has been little research into the behaviour of heavy users, although Lakhdar, Vaillant and Wolff (2016) estimate elasticity of demand for marijuana in a sample of 250 heavy (near daily) users in France. They report short-run elasticity ranging from -1.7 to -2.1 —much higher estimates than appear elsewhere in the literature.

Gender effects

There appears to be a gender difference in responsiveness to changes in the price of illicit drugs. Bretteville-Jensen (1999) suggests that women are more price-sensitive than men. The author estimates heroin demand equations for females and males separately. Regression results show that price elasticity of demand is -1.9 among females and -1.5 among males. Gallet (2014), however, finds no gender differences in price elasticity.

Cross-price elasticities

When estimating the demand function for a given drug type, some studies control for the price of alcohol, tobacco or other illicit drugs, reporting their respective cross-price elasticities. Gallet (2014) indicates that controlling for the impact of the cross-price elasticity of alcohol (other illicit drugs) on the own-price elasticity of a given drug will inflate (or deflate) the own-price elasticity. Olmstead et al. (2015) suggest that marijuana and heroin are neither complements nor substitutes, whereas cocaine and heroin are complements. In this context, a complement is a drug for which demand increases when a similar drug becomes cheaper (ie people use both drugs and, as one becomes cheaper, the other also increases in demand). A substitute is a drug whose demand increases when the price of another drug increases (ie users switch to substitutes when their preferred drug becomes more expensive). Saffer and Chaloupka (1999) also propose that cocaine and heroin are complements. Thompson and Koichi (2017) find that past marijuana consumption does not increase current cocaine or heroin consumption. Changes in marijuana price also do not affect consumption of these two drugs. Marijuana, however, is a weak complement to methamphetamine. There is little evidence of drug substitution from heroin to methamphetamine, despite declines in the purity-adjusted price of methamphetamine (Scott et al. 2015).

Types of data

Elasticity estimates depend on the type of data used. Estimates from experimental data tend to be larger in absolute value, compared to estimates from historical or crowdsourced data. This finding is consistent with Gallet (2014). For example, with regard to the US marijuana market, Davis et al. (2016) report elasticity ranging from -0.67 to -0.79 using crowdsourced data, whereas Collins et al. (2014) and Vincent et al. (2017) report higher elasticities of -1.75 and -1.37 respectively using experimental data.

A final potential driver of variation in price elasticity of demand is whether short-run or long-run price elasticity is being estimated. The length of time people have to respond to price changes affects the elasticity of demand. In general, demand tends to be more elastic in the long-run because people have more time to notice the change in price and act accordingly (Mankiw 2004). Consistent with Gallet (2014), we also find that demand for drugs is more elastic in the long run.

Discussion

Supply reduction is one of three pillars underpinning Australia's commitment to harm minimisation within the National Drug Strategy 2017–2026. Supply reduction has two principal aims: to curb onset and consumption by limiting opportunities for drug use, and to reduce drug use by manipulating the drug market in ways that discourage use and reduce demand. In econometric studies of illicit drug markets, price is an important market characteristic which has the potential to influence the behaviour of drug users. However, the extent to which drug users are, in fact, sensitive to price changes remains the subject of some debate. In this study, we systematically review and consolidate the most recent available empirical evidence on the price elasticity of demand for illicit drugs. To do this, we extend an earlier review by Gallet (2014) with an additional 12 articles published between 2010 and June 2019.

Together these studies suggest that the demand for illicit drugs is, on average, weakly price inelastic. By our estimate, a 10 percent increase in the price of illicit drugs results in a decrease in demand of approximately nine percent. Although technically inelastic, this result suggests law enforcement activities that increase drug prices can have a substantial effect on the quantity demanded—almost a one-to-one relationship. This estimate is considerably higher (ie more elastic) than was estimated by Gallet (2014). However, as mentioned earlier, Gallet's sample included a number of studies that estimated the price elasticity of participation, and participation elasticity is typically lower than consumption elasticity (Pacula & Lundberg 2014).

By drug type, price elasticity of demand is highest for methamphetamine (an average of -1.08 —indicating elastic demand). However, this estimate is based on a small number of studies (five in total, including two from Australia) and it should therefore be interpreted with caution. Using a behavioural economic approach in an Australian context, Chalmers, Bradford and Jones (2010, 2009) suggest that methamphetamine is highly price elastic, particularly among those who are not drug-dependent (an elasticity of -1.66 ; $n=101$). Methamphetamine is also found to be price elastic in the United Kingdom but inelastic in the US and Norwegian markets.

Given the relatively small number of studies estimating the price elasticity of demand for methamphetamine and the growing social harms caused by this type of drug, there is a strong case for the development of a well-designed experimental study. Such a study should be multi-jurisdictional, include purity or quality adjustments, attempt to estimate the degree of substitution between methamphetamine and other drugs, and explore the price sensitivities of different user groups.

Demand for all other drug types was assessed as inelastic, and the link between price and demand was weakest for marijuana (an average of -0.79), followed by cocaine (-0.84) and heroin (-0.94). Consistent with earlier analyses and with economic theory, price elasticity of demand tends to be lower in the short-run than in the long-run. Further, it appears that the relative purity of a substance matters, and that some of the apparent inelasticity between price and demand may be explained by fluctuations in purity or quality.

Although the number of studies included in this systematic review is relatively small, a number of important trends are worth noting. First, price elasticity of demand appears to be specific to the local or regional context. This makes it difficult to translate the findings from one country to another or from one market to another, even within Australia. This geographical variability points to a number of important local conditions that likely impact the relative effectiveness of law enforcement strategies seeking to manipulate drug price as a mechanism for curbing demand.

Second, a change in price is not experienced or responded to equally by all drug users. Price increases, for example, are likely to have a greater impact on existing users than on potential new users. Third, it appears female drug users are more sensitive to price changes than male drug users. Finally, cross-drug substitution is a feature of drug market activity that likely affects the calculation of demand elasticities. The extent to which drug users are prepared to switch between drugs as relative prices change should be the subject of future research.

Although in this analysis we focus on price elasticity of demand, it is important to acknowledge that price increases are not the only possible outcome of a reduction in supply. Suppliers may alter their drug market strategies in a number of other ways, some of which can significantly increase harm rather than reduce it. For example, to maintain street-level supply at consistent prices, suppliers may increase the use of cutting agents and other adulterants. By decreasing the purity of their product, suppliers can manage short-term supply reductions, albeit at significant detriment to the health of their customers. The demand reduction benefit of any supply reduction strategy must be weighed against these other potential outcomes and the hidden harms that can result.

Further, the measure of elasticity in drug markets cannot be considered in isolation from the cost (both financial and social) of producing the requisite changes in supply. As noted earlier, law enforcement is responsible for approximately two-thirds of current expenditure in drug policy (Shanahan & Ritter 2013) and many drug market interventions are of limited or unknown benefit (Mazerolle, Soole & Rombouts 2007). In addition, law enforcement activities have been shown to result in a number unintended and sometimes negative consequences to both drug users and the wider community. Any quantitative or qualitative assessment of price elasticity should not be interpreted in isolation of the cost of reducing supply. Indeed, it would be important for future research to consider the relative benefit of supply reduction strategies when weighed against their financial and non-financial costs.

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Appendix

Figure A1: Preferred reporting items for systematic reviews and meta-analyses (PRISMA)

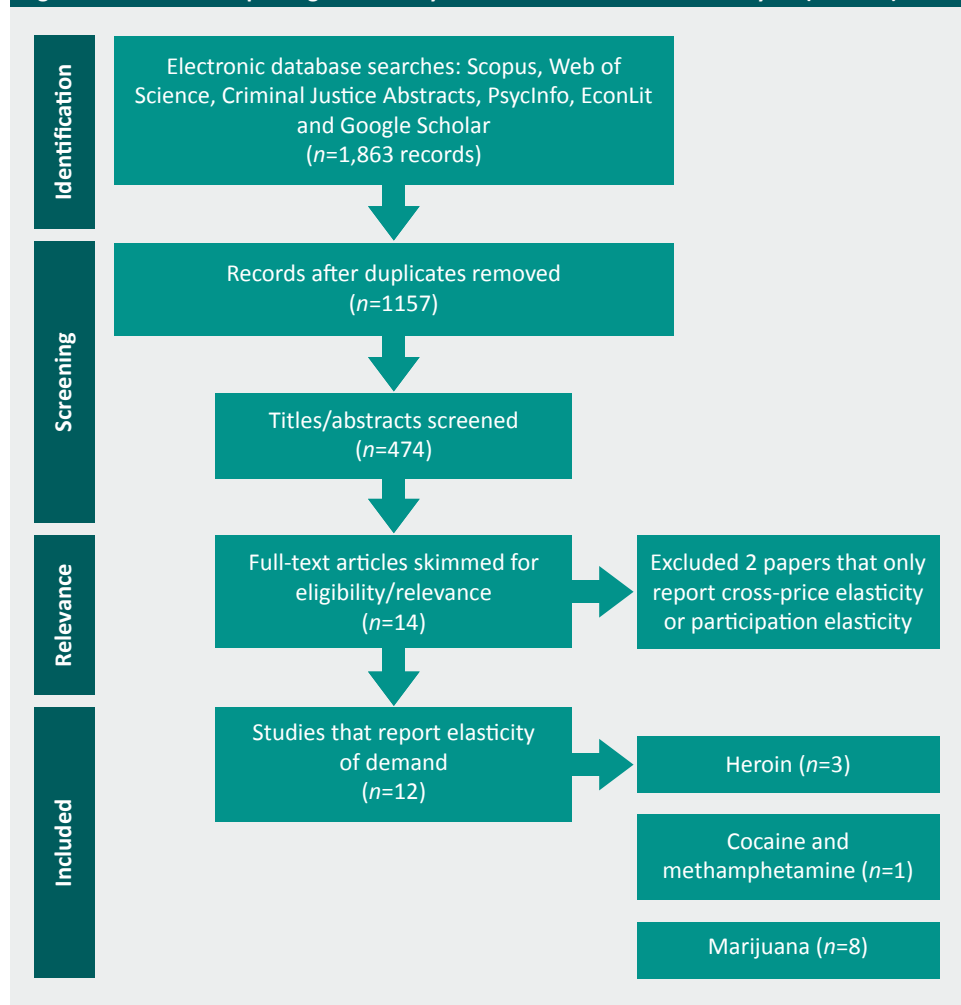


Table A1: Full citations for all studies included in this systematic review

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14. Street-level drug law enforcement: An updated systematic review

Lorraine Mazerolle, Elizabeth Egghins and Angela Higginson

Australian drug policy costs between A\$1.03b and A\$1.07b each year (Ritter, McLeod & Shanahan 2013). This estimate includes police services, judicial resources, legal expenses, corrective services, Australian Federal Police, Australian Customs, and Border Force. Nearly two-thirds of drug policy expenditure is spent on state and federal law enforcement activities (Ritter, McLeod & Shanahan 2013). These activities include both proactive street-level drug law enforcement tactics—including third party partnership policing (eg police working with business and other government regulators) as well as problem-oriented policing (Weisburd & Majmundar 2018)—and a range of reactive, ‘standard’ policing tactics including crackdowns, raids, and buy-busts.

A 2007 Campbell Collaboration systematic review of the effectiveness of street-level drug law enforcement activities (Mazerolle, Soole & Rombouts 2007) found that proactive interventions (such as problem-oriented, partnership and community-wide policing approaches) were more effective at reducing drug-related calls-for-service and drug crime than business-as-usual or ‘standard’ (usually reactive) law enforcement tactics. Since 2004, when the literature search for the 2007 review was conducted, the landscape around street-level drug law enforcement has changed. Police now face a range of new and emerging drug problems, including synthetic and prescription drugs and new forms of street-level drug distribution, including online markets and postal services for purchasing and distributing illicit substances. In addition, the Global Policing Database demonstrates that high-quality impact evaluations of policing interventions have trebled since 2004 (Mazerolle et al. 2017). Therefore, there is a need to understand whether the findings of the previous review are still applicable, given the shifts in the drug landscape and the increase in evaluations of police practice. This report updates the 2007 review, and provides the most up-to-date and high-quality evidence to inform policy and practice on street-level drug law enforcement.

Method

The updated review uses the Global Policing Database (GPD) to capture evaluations of the impact of street-level law enforcement interventions on drug crime and drug-related calls-for-service. The GPD is an online searchable database designed to capture all published and unpublished experimental and quasi-experimental impact evaluations of policing interventions conducted since 1950. It is compiled by systematically searching, retrieving, and screening published and unpublished literature that reports on impact evaluations of policing interventions. There are no restrictions on the types of policing techniques, outcomes or language. A complex search string was used to search more than 60 academic databases for relevant documents (see Higginson et al. 2015 for full methodological protocol). Table 1 contains the terms used to search the GPD for research published between January 2004 and December 2018. In addition to searching the GPD, we harvested the reference lists of all included studies and of previous reviews related to drug law enforcement. A team of research staff, supervised by Egghins, were trained with standardised materials to screen records retrieved from the search and code eligible studies. The coding of all eligible studies was cross-checked by Egghins and Higginson prior to synthesis.

Table 1: Systematic search terms

Drug search terms		Highly drug-specific law enforcement or drug market terms	
addict*	mephedrone	bust*	interdict*
acid	methadone	buy	launder*
amphet*	meth	caution*	legali*
bath*	naloxone*	closedown*	market*
benzo*	narco*	“close down”	network*
cannab*	opiate*	“close-down”	operation*
cocaine	opioid*	confisc*	precursor*
“date rape”	oxy*	covert	raid*
“date-rape”	overdos*	crack*	rave*
depressant*	pharma*	dark*	referral*
drug*	poly*	deal*	sale*
ecstasy	precurs*	decrim*	saturat*
fentanyl	prescri*	delivery	smuggl*
GBL	pseudo*	deliveries	stop*
GHB	psychoactive	demand*	sting*
hallucino*	Rohypnol	depenali*	substitute*
heroin	speed	disposal*	suppl*
illicit*	spice*	disrupt*	suppress*
impair*	spik*	diver*	sweep*
inject*	steroid*	eradic*	traffick*
intoxica*	stimulant*	expiation	undercover
ketamine	substance*	farm*	
LSD	synthetic*	harm*	
marij*	tranquili*	informant*	
MDMA	weed	informer*	

Note: Terms were combined with Boolean ‘OR’ to search titles and abstracts of all GPD records

Inclusion criteria

Types of interventions

Consistent with the 2007 review, this update includes any study where the intervention is initiated, managed, and/or implemented by police to reduce or prevent illicit drug use, drug dealing, or associated drug problems at problem places. The updated review includes policing interventions where:

- the intervention targets, at least in part, illicit drugs (eg heroin, cocaine, methamphetamine, cannabis); and
- street-level drug law enforcement is either the only intervention or is one component of a larger intervention.

The review excludes interventions where:

- the intervention targets the illegal use, sale or trafficking of licit substances (eg tobacco, alcohol, solvents) or prescription drugs;
- judicial, correctional and treatment or anti-drug strategies are run exclusively by non-police personnel (eg customs, army);
- police target the wholesale, manufacture or importation of drugs; or
- police interventions are aimed at individuals (eg arrest referral).

Types of participants and settings

This review considers the impact of street-level drug law enforcement interventions on the following population subjects:

- individuals of any age, gender, or ethnicity;
- micro places (eg street corners, buildings, police beats, street segments); and
- macro places (eg neighbourhoods, communities, police districts, cities).

In line with the 2007 review, interventions must be focused on geographic places. No limits are placed on the geographical regions reported in the studies (ie we include high-, low- and middle-income countries in the review).

Types of outcomes

The review includes studies where the reported outcome is drug crime aggregated at the place level. 'Drug crime' is defined as any outcome that falls into one or more of the following categories:

- a drug activity classified as illegal by legislation, including:
 - selling, buying, manufacturing, or possessing drugs or paraphernalia;
 - public nuisance due to illicit drugs (not alcohol); and
 - driving under the influence of drugs (not alcohol).
- variables suggestive of drug crime, including:
 - drug-related arrests;
 - drug-related fines, citations or notices;
 - drug-related calls-for-service;
 - drug-related convictions; and
 - drug-related recidivism.

In line with the 2007 review, this update includes data captured by official sources (eg calls-for-service, arrests, convictions) but excludes outcome data measured via self-report instruments (eg surveys, questionnaires), interviews or observations.

Types of research designs and comparators

The review includes quantitative impact evaluations that use a randomised experimental or quasi-experimental design with a comparison group that does not receive the intervention. It includes studies where the comparison group receives 'business-as-usual' policing, no intervention or an alternative intervention (treatment–treatment designs). The review retains the research design thresholds used in the 2007 review, and only includes quasi-experimental studies where there is a comparison condition (unmatched or matched) and a baseline pre-intervention measure of eligible outcomes. All other weaker research designs are ineligible for this review.

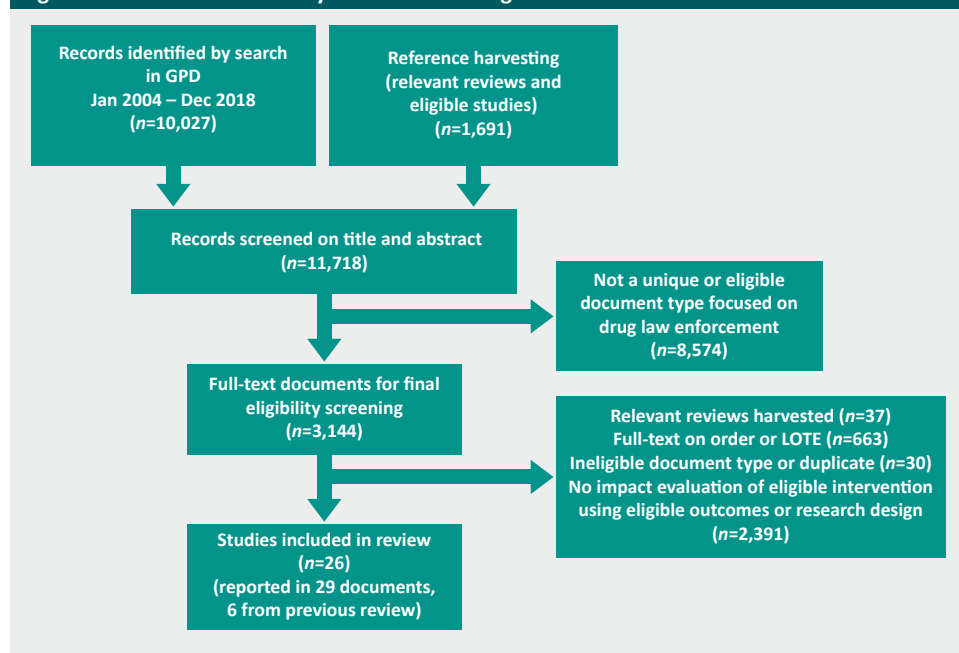
Results

Search and screening

The systematic search within the GPD identified 75,005 records, with citations gathered from over 60 databases and research repositories. Of these, 10,027 had been full-text screened as reporting (or potentially reporting) on a quantitative impact evaluation of an intervention pertaining to police or policing. These records were then processed using SysReview (review management software, Higginson & Neville 2014) to determine their eligibility for the current review. In addition, we harvested and processed potentially eligible studies from the reference lists of 37 reviews relevant to the topic area and all eligible studies. Figure 1 provides a PRISMA flowchart showing the attrition of records through the systematic screening stages.

A total of 26 studies (reported in 29 documents) were eligible for the review, including six studies from the 2007 review. Of these, 18 studies reported sufficient data to calculate effect sizes and are included in the meta-analysis. Only three randomised controlled trials were identified, and all but two studies (one each in the United Kingdom and Canada) were conducted in the United States. All 26 studies are summarised in the appendix in Table A1.

Figure 1: PRISMA flowchart: Systematic screening of GPD records



Meta-analysis and summary of eligible studies

All the studies included in the meta-analysis reported counts or rates of crime, before and after the intervention, in both the intervention area(s) and the comparison area(s). We conducted meta-analysis with the 'metan' function in the statistical software Stata 15, using a random effects model with inverse variance weighting. The relative incidence rate ratio (RIRR) effect size and its corresponding 95 percent confidence intervals (CIs) were calculated for all studies included in the meta-analysis. The RIRR can be interpreted as the relative proportional change in crime in the comparison area after the intervention, compared to the treatment area. The relative proportional change in crime in the treatment area is calculated using $1/\text{RIRR}$. For ease of interpretation:

- An RIRR that is larger than 1 is evidence that the intervention is effective in reducing crime.
- An RIRR of 1 means there has been no change in crime in the treatment area, relative to the comparison area.
- An RIRR less than 1 means that crime has decreased in the comparison area after the intervention, relative to the treatment area.

For example, an RIRR of 1.25 indicates a 25 percent increase in crime in the comparison area, relative to the treatment area; an RIRR of 0.75 indicates a 25 percent relative decrease in crime in the comparison area.

The eligible studies were categorised to examine whether the impact of the street-level drug law enforcement interventions vary by:

- the size of the problem place targeted by the intervention, categorised as:
 - micro places (eg street corners, buildings, police beats, street segments); and
 - macro places (eg neighbourhoods, communities, police districts); or
- the type of policing approach, as defined in the 2007 review:
 - hotspots policing;
 - problem-oriented policing; and
 - community-wide policing initiatives.

Hotspots policing strategies often consist predominantly of law enforcement tactics; however, the hotspots approach is strategically focused on reducing problems in small places with high concentrations of crime (hotspots).

Problem-oriented policing approaches are defined as involving careful analysis of the underlying criminogenic factors that lead to crime problems and the development and implementation of tailored responses, and then the use of an assessment feedback loop to determine whether or not the interventions reduced the problems. Problem-oriented policing can be geographically focused or it can be focused on problem individuals, and the approach typically involves the forging of partnerships.

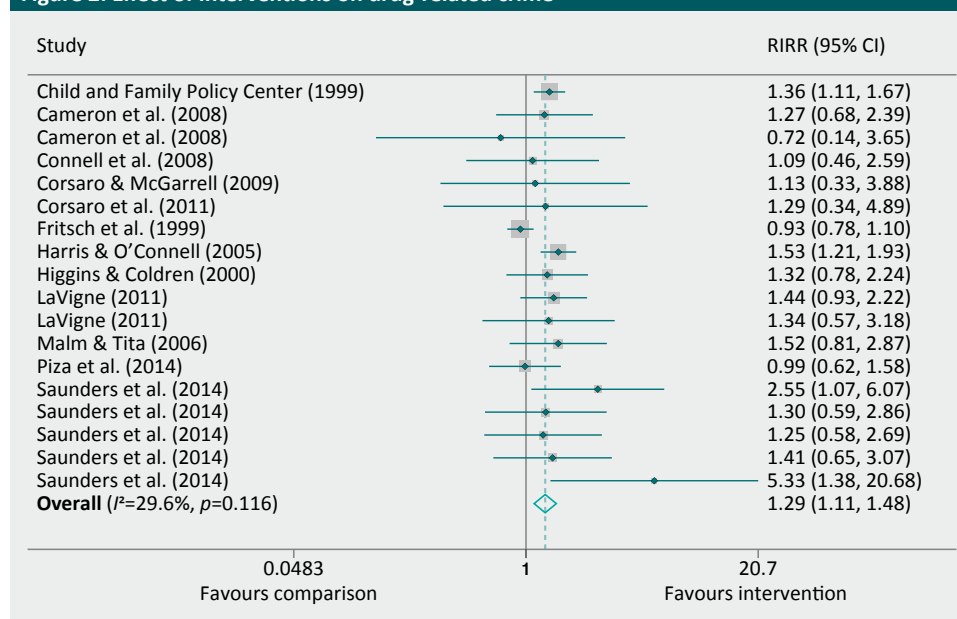
Community-wide policing interventions are defined as adopting a broad multi-agency approach, paying little attention to targeting repeat offenders, repeat victims or geographic concentrations of crime in a given jurisdiction. Initiatives that aim to improve police–citizen relationships in a neighbourhood, like the Weed and Seed program in the United States, are examples of community-wide policing interventions.

Impact of street-level interventions on drug crime

Eighteen studies examined the impact of street-level drug law enforcement on drug crime. The findings of these studies are summarised in Figure 2. Although only four studies show individually statistically significant impacts on drug crime, the overall synthesised effect shows that these place-level policing interventions significantly reduce drug crime in the treatment areas, relative to the comparison areas (RIRR=1.29, 95% CI: 1.11–1.48). The results also indicate that the impact of these place-level policing interventions is relatively stable, as there is no significant variation among the effects of the included studies ($I^2=29.6\%$, $p=0.116$).

One other eligible study, reported in Adda et al. (2014a, 2014b), examined the impact of cannabis depenalisation on drug crime. As this intervention was anticipated to work in a very different manner from the other policing interventions, this study was synthesised separately. Cannabis depenalisation policing showed no significant impact on drug crime.

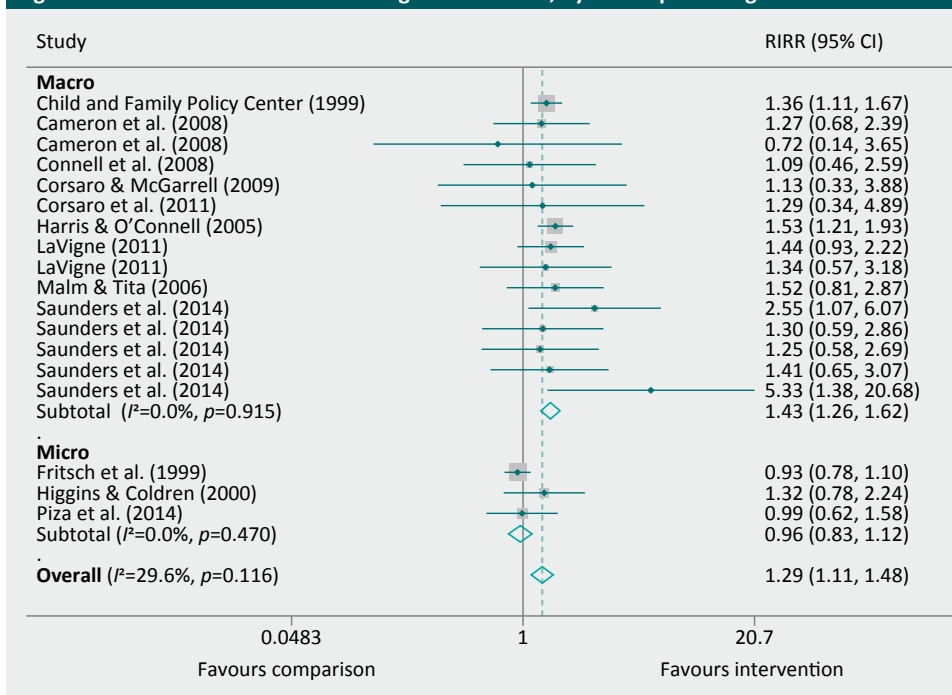
Figure 2: Effect of interventions on drug-related crime



Note: Weights are from random effects analysis. RIRR=relative incidence rate ratio. CI=confidence interval

Moderator analysis: Intervention impact by size of place (drug crime)

Although the results of the overall analysis on drug crime indicated that there was not significant variability among the included studies, we examined whether the impact of the interventions on drug crime varies by the size of the place targeted by the intervention. Figure 3 provides the results of a moderator analysis which demonstrates that interventions targeted at macro levels of place (eg neighbourhoods, communities, police districts, cities) were more effective at reducing drug crime than interventions targeted at micro places (eg street corners, buildings, police beats, street segments). Interventions targeted at macro places significantly reduce drug crime in the treatment areas, relative to the comparison areas (RIRR=1.43, CI: 1.26–1.62), while interventions targeted at micro places show no significant impact on drug crime. The results also indicate that there is no significant variation among the effects of the included studies within each category of geography.

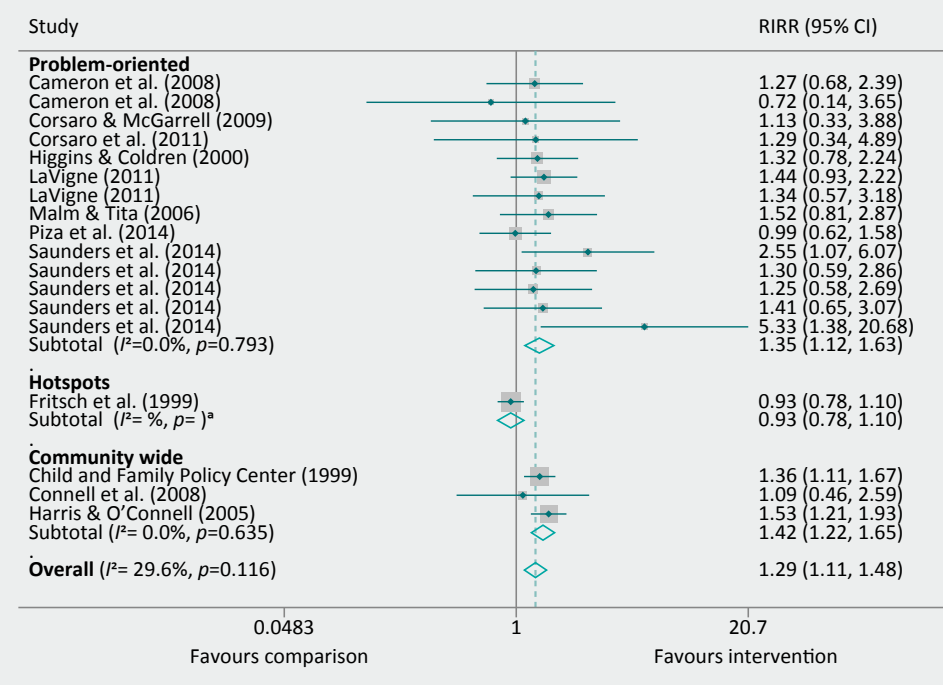
Figure 3: Effect of interventions on drug-related crime, by size of place targeted

Note: Weights are from random effects analysis. RIRR=relative incidence rate ratio. CI=confidence interval

Moderator analysis: Intervention impact by type of policing approach (drug crime)

Figure 4 provides the results of a moderator analysis which examines whether the impact of the interventions on crime vary by the specific type of policing approach implemented, excluding depenalisation. The results demonstrate the effectiveness of both problem-oriented (RIRR=1.35, CI: 1.12–1.63) and community-wide (RIRR=1.42, CI: 1.22–1.65) policing strategies for reducing drug crime. The one study that evaluated hotspots policing (without problem-oriented strategies) showed no significant effect on drug crime. The results also indicate that there is no significant variation among the effects of the included studies within each category of policing strategy.

Figure 4: Effect of interventions (excluding depenalisation) on drug-related crime, by type of policing approach



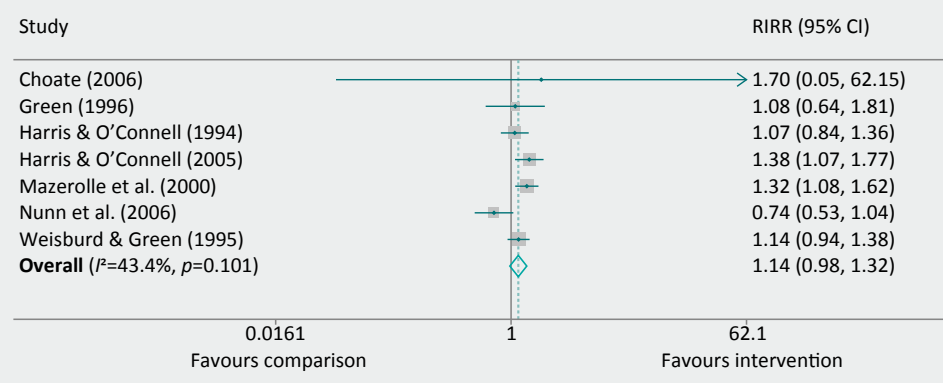
a: A heterogeneity statistic (I^2) and p -value were not produced because there is only one study included in the moderator analyses

Note: Weights are from random effects analysis. RIRR=relative incidence rate ratio. CI=confidence interval

Impact of street-level interventions on drug calls-for-service

Seven studies examined the impact of street-level drug law enforcement on drug-related calls-for-service. These studies are summarised in Figure 5. The overall synthesised effect shows that these place-level policing interventions have no significant effect on drug-related calls-for-service (RIRR=1.14, CI: 0.98–1.32). The results also indicate that there is no significant variation among the effects of the included studies.

Figure 5: Effect of interventions on drug-related calls-for-service



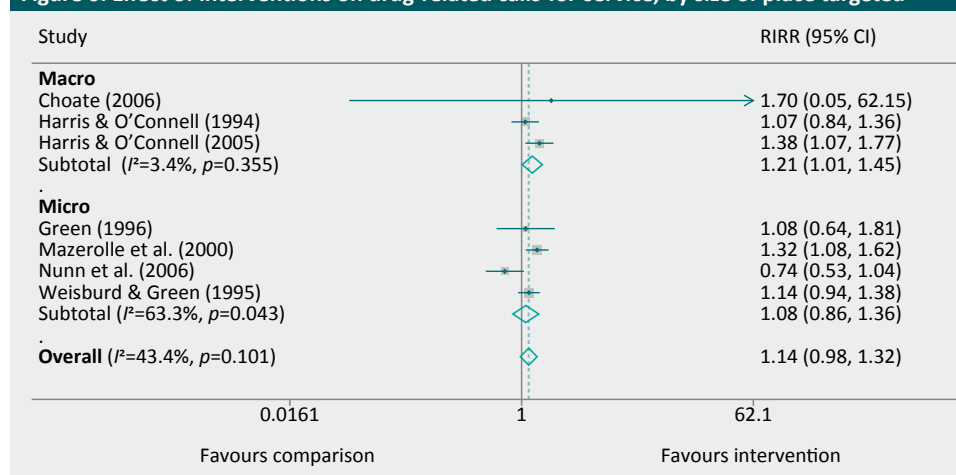
Note: Weights are from random effects analysis. RIRR=relative incidence rate ratio. CI=confidence interval

Moderator analysis: Intervention impact by type of size of place (calls-for-service)

Figure 6 provides the results of a moderator analysis which examines whether the impacts of the interventions on drug-related calls-for-service vary by size of the place targeted. The results demonstrate that interventions targeted at macro places significantly reduce drug-related calls-for-service in the treatment areas, relative to the comparison areas (RIRR=1.21, CI: 1.01–1.45), while interventions targeted at micro places show no significant impact on drug-related calls-for-service (RIRR=1.08, CI: 0.86–1.36). However, the results do not show a significant difference between the impact of interventions targeted at macro levels of place and interventions targeted at micro places.

The results also indicate that, while there is no significant variation among the effects of the interventions targeted at macro places, there is significant variation in effectiveness among the micro-place interventions ($I^2=63.3\%$, $p=0.043$).

Figure 6: Effect of interventions on drug-related calls-for-service, by size of place targeted



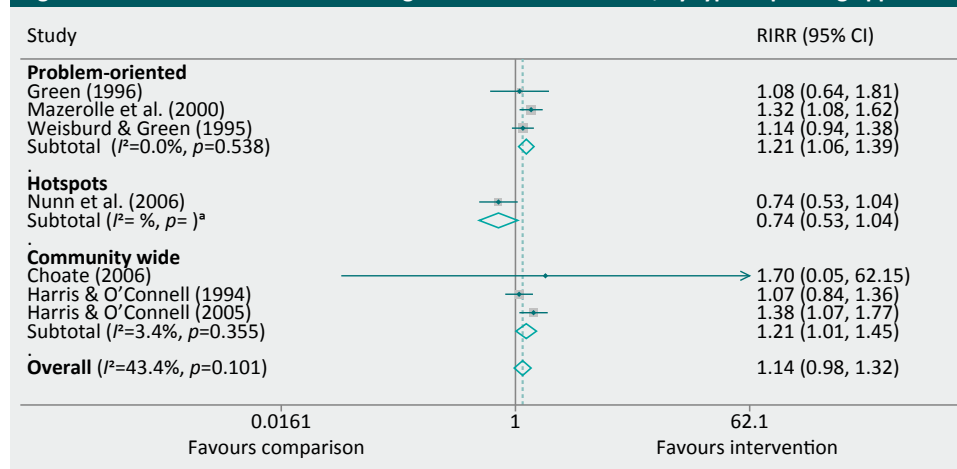
Note: Weights are from random effects analysis. RIRR=relative incidence rate ratio. CI=confidence interval

Moderator analysis: Intervention impact by type of policing approach (calls-for-service)

Figure 7 provides the results of a moderator analysis which examines whether the impact of the interventions on drug-related calls-for-service vary by the specific type of policing approach implemented. The results demonstrate that both problem-oriented policing interventions (RIRR=1.21, CI: 1.06–1.39) and community-wide policing interventions (RIRR=1.21, CI: 1.01–1.41) significantly reduce drug-related calls-for-service in the treatment areas, relative to the comparison areas, while one study that evaluated hotspots policing (without problem-oriented strategies) showed no significant effect on drug-related calls-for-service.

The results also show a significant difference between the impacts of problem-oriented policing and hotspots policing strategies, but no other significant differences among the three groups of strategies. The results also indicate that there is no significant variation among the effects within any of the three groups of strategies.

Figure 7: Effect of interventions on drug-related calls-for-service, by type of policing approach



a: A heterogeneity statistic (I^2) and p -value were not produced because there is only one study included in the moderator analyses

Note: Weights are from random effects analysis. RIRR=relative incidence rate ratio. CI=confidence interval

Discussion

This updated review of the impact of street-level drug law enforcement interventions on drug-related crime and calls-for-service highlights four key points. First, we note the substantial increase in the number of high-quality impact evaluations of place-focused drug law enforcement interventions since the original review in 2007. However, even with this increase in high-quality studies, we still observe a general lack of high-quality impact evaluations outside of the United States and a dearth of randomised controlled trials testing the effectiveness of place-focused drug law enforcement interventions in Australia, despite this trial type being the most robust method for determining whether or not an intervention works.

Second, we find that geographically targeted law enforcement interventions, overall, appear more effective for reducing drug crime than standard, unfocused approaches to street-level drug law enforcement. Nonetheless, the evidence around the effectiveness of place-focused drug law enforcement is less compelling when we consider drug-related calls-for-service as the measured outcome. This suggests that citizens may not be as aware of drug dealing at the micro-place level (or perhaps not as willing to call the police), which is consistent with the findings of the original review.

Third, consistent with the 2007 review, we find that proactive problem-oriented and community-wide interventions, where police services partner with other entities, are more effective in reducing drug-related crime and calls-for-service than reactive hotspots interventions. As with the original review, we suggest that partnership approaches to tackling street-level crime problems are more effective ways for reducing ongoing drug problems than police working alone or in a reactive manner (eg hotspots policing or directed patrols).

Fourth, we find that street-level drug law enforcement approaches that focus on larger problem areas, such as neighbourhoods, suburbs and beats, tend to be more effective than approaches that focus on smaller, more micro problem places. Whether they are part of a community-wide or a problem-focused intervention, partnership approaches are likely easier to forge when they are focused on large geographic areas, like whole neighbourhoods or communities. In Australia, these could be partnerships with local drug treatment centres, city councils, local health and welfare clinics or community organisations (eg Neighbourhood Watch). These types of partners are likely to work across broad geographic areas rather than being narrowly focused on micro places. It may even be that the greater availability of partners at a broader, community-wide level is the reason why street-level drug law enforcement approaches are found to be more effective in larger problem areas than in micro places.

We recognise some limitations of our review. First, this is a partial update of the 2007 Campbell Collaboration review conducted by Mazerolle, Soole and Rombouts. We recognise in particular the changing landscape of street-level illicit drug use, particularly relating to the use of prescription drugs. Nevertheless, we have opted to retain the original eligibility criteria used in the 2007 review and have excluded studies focused on prescription drugs. However, we suggest that a new review that looks broadly at multi-sector responses to illicit prescription-drug use and distribution is needed. These new categories of drug use may or may not respond to street-level drug law enforcement interventions in the same way as is found in this review. Overall, we recommend that practitioners and policymakers focus on community-level, partnership approaches to tackling street-level drug problems in Australia.

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Appendix

Table A1: Summary of eligible studies

Study name	Location	Intervention, participants, research design	Outcome measured
Adda et al. (2014a) Adda et al. (2014b) McConnell (2015)	United Kingdom (Lambeth, London)	Problem-oriented Macro places (boroughs) Quasi-experiment	Drug offences (arrests)
Cameron et al. (2008)	United States (Los Angeles, California)	Hotspots Micro places (housing estates, specific streets) Quasi-experiment	Rates of drug crime
Child and Family Policy Center (1999)	United States (Des Moines, Iowa)	Community-wide Macro places (neighbourhoods) Quasi-experiment	Drug/narcotic violations, total number of offences
Choate (2006)	United States (Tucson, Arizona)	Community-wide Macro places (neighbourhoods) Quasi-experiment	Drug-related calls-for-service
Connell, Miggans & McGloin (2008)	United States (not otherwise specified)	Community-wide Macro places (suburbs) Quasi-experiment	Rates of drug crime
Corsaro (2013)	United States (High Point, North Carolina)	Problem-oriented Macro places (neighbourhoods) Quasi-experiment	Drug offences
Corsaro et al. (2011)	United States (Peoria, Illinois)	Problem-oriented Macro places (police districts) Quasi-experiment	Rates of drug crime
Corsaro et al. (2009)	United States (Nashville, Texas)	Problem-oriented Macro places (neighbourhoods) Quasi-experiment	Rates of drug crime

Table A1: Summary of eligible studies (cont.)

Study name	Location	Intervention, participants, research design	Outcome measured
Fritsch et al. (1999)	United States (Dallas, Texas)	Hotspots Micro places (patrol beats) Quasi-experiment	Drug offences (arrests)
Harris et al. (2005)	United States (West Centre City, Wilmington, Delaware)	Community-wide Macro places (neighbourhoods) Quasi-experiment	Number of drug-related arrests and drug complaints
Harris & O'Connell (1994)	United States (Wilmington, Delaware)	Community-wide Macro places (neighbourhoods) Quasi-experiment	Drug-related calls-for-service
Higgins & Coldren (2000)	United States (Chicago, Illinois)	Problem-oriented Micro places (police districts in Chicago) Quasi-experiment	Drug-related arrests calls-for-service
La Vigne et al. (2011)	United States (Chicago, Illinois)	Problem-oriented Macro place (census block groups) Quasi-experiment	Rates of drug crime
Lawton et al. (2005)	United States (Philadelphia, Pennsylvania)	Hotspots Micro places (street segments /addresses) Quasi-experiment	Rates of drug crime
Malm (2006); Malm & Tita (2006)	Canada (British Columbia)	Problem-oriented Macro places (areas in British Columbia) Quasi-experiment	Yearly rates of marijuana production
Mazerolle et al. (2000)	United States (Oakland, California)	Problem-oriented Micro places (street blocks) Randomised experiment	Drug-related calls-for-service

Table A1: Summary of eligible studies (cont.)

Study name	Location	Intervention, participants, research design	Outcome measured
McCabe (2009)	United States (Queens County, New York)	Community-wide Macro places (police precincts) Randomised experiment	Arrests for controlled substances
Nunn et al. (2006)	United States (Brightwood, Indianapolis, Indiana)	Hotspots Micro places (streets) Quasi-experiment	Drug-related calls-for-service
O'Connell et al. (2004)	United States (multiple locations)	Community-wide Macro places Quasi-experiment	Rates of drug crime
Piza et al. (2015)	United States (Newark, New Jersey)	Problem-oriented Micro places (CCTV cameras on street segments) Randomised experiment	Number of drug crime incidents
Robinson (2008)	United States (Portland, Oregon)	Problem-oriented Macro places (Portland city) Quasi-experiment	Drug sales arrests
Roman et al. (2005)	United States (Miami, Florida)	Community-wide Macro places (neighbourhoods) Quasi-experiment	Rates of drug crime
Saunders et al. (2015)	United States (High Point, North Carolina)	Problem-oriented Macro places (neighbourhoods) Quasi-experiment	Monthly number of drug crimes and calls-for-service
Shoaf (2005)	United States (Akron, Ohio)	Community-wide Macro places (cities) Quasi-experiment	Rates of drug crime

Table A1: Summary of eligible studies (cont.)

Study name	Location	Intervention, participants, research design	Outcome measured
Telep & Hibdon (2018)	United States (Seattle, Washington)	Hotspots Macro areas (residential areas/ blocks) Quasi-experiment	Drug-related calls-for-service
Weisburd & Green (1995)	United States (Jersey City, New Jersey)	Problem-oriented Micro places (street blocks) Randomised experiment	Drug-related calls-for-service

This work was originally published as *Trends & issues in crime and criminal justice* no. 599. It is available online at <https://www.aic.gov.au/publications/tandi/tandi599>.

15. Is there fentanyl contamination in the Australian illicit drug market?

Alexandra Voce and Tom Sullivan

Fentanyl is a highly potent synthetic opioid prescribed for the treatment of severe pain that is often used for non-medical purposes. The opioid crisis in North America saw a rise in non-prescribed and unintentional use of fentanyl, and an associated increase in synthetic opioid related deaths (Hedegaard, Miniño & Warner 2018). While fentanyl-related mortality is low in Australia, a large proportion of overdose deaths involved the injection of fentanyl diverted from the medical system (Roxburgh et al. 2013). Further, there is emerging evidence of unintentional fentanyl use in Australia, with recent cases identified in Sydney (NSW Health 2020) and Melbourne (Barratt et al. 2019; Rodda et al. 2017). Drawing on urinalysis and self-reported fentanyl use data, this study aims to investigate the prevalence and patterns of fentanyl use among police detainees, examine the polydrug use of fentanyl and other licit and illicit substances, and compare reported fentanyl use with urinalysis results.

Method

This study used data from the Australian Institute of Criminology's Drug Use Monitoring in Australia (DUMA) program. The DUMA program collects data about drug use, criminal offending and socio-demographic characteristics from individuals detained at selected police stations and watch houses in Perth, Brisbane, Adelaide and Sydney (Voce & Sullivan 2019). In July and August 2019, 566 participants responded to a special fentanyl addendum that asked about their use of fentanyl and its analogues, patterns of use, reasons for use, polydrug use, and perceptions of the drug. Interviewers also asked respondents to provide a voluntary urine sample, which was tested for fentanyl and other drugs. Respondents were mostly male (81%, $n=460$), non-Indigenous (76%, $n=430$), and had a median age of 33 (interquartile range=26–41). Seventy-nine percent ($n=418$) of eligible detainees voluntarily provided a urine sample.

The Forensic and Analytical Science Service of NSW Health Pathology performed fentanyl immunoassay screening on all urine samples. As is routine for the DUMA program, samples were screened for amphetamines, benzodiazepines, cannabis, cocaine, opioids, 6-monoacetylmorphine (a heroin metabolite), methadone and buprenorphine.

The fentanyl immunoassay screening had a cut-off of 1ng/mL for fentanyl but had poor cross-reactivity towards particular fentanyl analogues such as carfentanil. Thus, samples that tested positive for fentanyl or other opioids were also subjected to confirmatory testing to ascertain the specific drug present in the urine. Confirmatory testing was performed using liquid chromatography–tandem mass spectrometry, with sensitivity in the sub-ng/mL range, allowing a large range of fentanyl analogues to be detected. The confirmatory testing cut-offs for fentanyl and its analogues were greater than or equal to 0.1µg/L, except for despropionylfentanyl and sufentanil, both of which had cut-offs greater than or equal to 0.5µg/L.

The laboratory provided the urinalysis test results in electronic format. Two respondents from Adelaide completed the DUMA core survey and tested positive to fentanyl, but were excluded from further analyses as they did not complete any items in the fentanyl addendum.

Results

Urinalysis

Confirmatory urinalysis testing indicated that three percent of detainees ($n=13$) tested positive to fentanyl and/or its major metabolite norfentanyl (see Table 1). Two detainees in Sydney also tested positive to the fentanyl analogue β -hydroxyfentanyl (0.5%).

Table 1: Detainees testing positive to fentanyl

	<i>n</i>	%
Adelaide ($n=76$)	2	2.6
Brisbane ($n=156$)	7	4.5
Perth ($n=131$)	2	1.5
Sydney ($n=55$)	2	3.6
National ($n=418$)	13	3.1

Note: Base is the total number of detainees who provided a urine sample

Source: AIC DUMA collection 2019 [computer file]

Eleven of the 13 detainees (85%) who tested positive to fentanyl also tested positive to methamphetamine, although these detainees constituted only a small proportion (5%, $n=11$) of all those who tested positive to methamphetamine. Among the 13 detainees who tested positive to fentanyl, two (15%) also tested positive to 6-monoacetylmorphine (a heroin metabolite), both in Sydney. This overlap constituted 18 percent of the total number who tested positive for heroin. Almost one-third of detainees who tested positive to fentanyl also tested positive to buprenorphine (31%, $n=4$). Relative to detainees who tested positive to fentanyl, those who tested negative to fentanyl were significantly less likely to test positive to methamphetamine (47%, $n=192$; $\chi^2(1)=6.98$, $p=0.008$, $\Phi=0.13$), heroin (2%, $n=9$; $\chi^2(1)=8.51$, $p=0.004$, $\Phi=0.14$), and buprenorphine (8%, $n=32$; $\chi^2(1)=8.37$, $p=0.004$, $\Phi=0.14$).

Reported fentanyl use

Overall, 11 percent ($n=65$) of detainees reported having used fentanyl in their lifetime, ranging from 10 percent in Perth ($n=20$) to 14 percent in Sydney ($n=10$). Most of these (68%, $n=44$) had used non-prescribed fentanyl. Four percent ($n=23$) of respondents reported using fentanyl in the past 12 months, with two percent using non-prescribed fentanyl in that period ($n=14$).

Seventy-three percent ($n=32$) of non-prescribed fentanyl users had used fentanyl from a transdermal patch, typically by injecting the solution extracted from the patch ($n=29$). A small number of fentanyl users had either inhaled a nasal spray (7%, $n=3$) or swallowed or injected a lozenge (7%, $n=3$).

Relative to detainees who had never used non-prescribed fentanyl, respondents who reported using non-prescribed fentanyl were significantly more likely to have used methamphetamine, heroin, cocaine and benzodiazepines during the past 12 months (see Table 2). These detainees were also more likely to self-report dependence on heroin and methamphetamine in the past 12 months.

Table 2: Self-reported drug use and dependence in the past 12 months, by reported lifetime non-prescribed fentanyl use

	Lifetime fentanyl use		No fentanyl use		χ^2 test (p -value); phi
	n	%	n	%	
Drug use in the past 12 months					
Methamphetamine	42	95.4	277	53.4	$\chi^2(1)=29.25$ ($p<0.001$); $\Phi=0.23$
Cannabis	30	68.2	298	57.2	$\chi^2(1)=2.01$ ($p=0.156$); $\Phi=0.06$
Heroin	19	43.2	51	9.8	$\chi^2(1)=41.56$ ($p<0.001$); $\Phi=0.27$
Alcohol	32	72.7	385	73.9	$\chi^2(1)=0.03$ ($p=0.866$); $\Phi=-0.01$
Cocaine	13	29.6	88	16.9	$\chi^2(1)=4.71$ ($p=0.030$); $\Phi=0.09$
Benzodiazepine	30	69.8	161	31.1	$\chi^2(1)=26.46$ ($p<0.001$); $\Phi=0.22$
Drug dependence in the past 12 months					
Methamphetamine dependence	22	50.0	149	28.8	$\chi^2(1)=8.58$ ($p=0.003$); $\Phi=0.12$
Cannabis dependence	9	20.5	99	19.2	$\chi^2(1)=0.04$ ($p=0.833$); $\Phi=0.01$
Heroin dependence	10	22.7	28	5.4	$\chi^2(1)=19.42$ ($p<0.001$); $\Phi=0.19$

Source: AIC DUMA collection 2019 [computer file]

No detainee who tested positive for fentanyl reported ever using any form of fentanyl. Detainees also under-reported their use of other drugs, but to a lesser degree—about half of those who tested positive for methamphetamine (54%, $n=110$) and two-thirds of those who tested positive for cannabis (63%, $n=113$) reported using these drugs in the 48 hours before their arrest.

Almost two-thirds of non-prescribed fentanyl users (59%, $n=26$) reported having used the drug simultaneously with other substances, particularly methamphetamine ($n=14$). Three percent of the total sample ($n=17$) reported that they had taken an illicit substance mixed or laced with fentanyl or a fentanyl-related substance—most commonly heroin ($n=6$) or methamphetamine ($n=5$).

Discussion

Three percent of detainees tested positive to fentanyl or the fentanyl metabolite norfentanyl. This was similar to the proportion who reported using fentanyl in the past 12 months (4%)—and the same proportion who reported using fentanyl in the past 12 months in separate studies in 2016 and 2018 (both 3%; Sullivan & Patterson 2018). However, no detainee who tested positive for fentanyl in this study reported ever using any form of fentanyl. Two respondents in Sydney also tested positive for β -hydroxyfentanyl, a highly potent and rarely reported fentanyl analogue (Hendrickson et al. 2019).

15. Is there fentanyl contamination in the Australian illicit drug market?

The discrepancy between urinalysis results and reported use may reflect unwitting use of fentanyl and possible fentanyl contamination of other illicit drugs. This interpretation is supported by data suggesting three percent of detainees had used drugs mixed or laced with fentanyl. These results align with recent unpublished evidence of unintended use of fentanyl-type substances in Melbourne in 2019 (Barratt et al. 2019) and Sydney in 2020 (NSW Health 2020). Prior to this study, the only published evidence of possible fentanyl contamination in Australia was a cluster of nine overdose deaths in Melbourne in 2015 (Rodda et al. 2017). Researchers suspected these cases involved fentanyl-laced heroin, as they occurred within two months, were in close geographical proximity, and resulted in positive toxicology tests for fentanyl and heroin (Rodda et al. 2017). Fentanyl contamination is well documented in illicit drug markets in the United States and Canada (Amlani et al. 2015; Hayashi et al. 2018).

Fentanyl use may also have been under-reported because some respondents failed to associate the application of transdermal fentanyl patches with illicit drug abuse and thus neglected to report it. The validity of self-report measures is lower among police detainees relative to the general population (Miller, Donnelly & Martz 1997), but these metrics are improved when clear assurances of confidentiality are provided (Darke 1998). The size of the discrepancy between urinalysis and reported fentanyl use is unlikely to be attributable to under-reporting alone.

Most detainees who tested positive to fentanyl (11 of 13) also tested positive for methamphetamine, and recent methamphetamine use and dependence was significantly more likely among those who reported non-prescribed fentanyl use compared to other detainees. The overlap between fentanyl and methamphetamine use may suggest detainees are using fentanyl to ease the symptoms of methamphetamine withdrawal, or ‘speedballing’ these drugs—combining an opioid and a stimulant to produce an intense high (Leri et al. 2004; Li, Wessinger & McMillan 2005). This is consistent with North American evidence suggesting fentanyl is used to enhance the effect of stimulants such as methamphetamine or cocaine (LaRue et al. 2019).

Some respondents who used methamphetamine may also have unintentionally consumed fentanyl, in the form of fentanyl-contaminated methamphetamine (LaRue et al. 2019). In February 2020, New South Wales Health issued a warning that fentanyl-related substances were being sold as methamphetamine and cocaine powder within Sydney, after several individuals experienced acetylfentanyl toxicity from unwittingly consuming the drug (NSW Health 2020). Given the prevalence of methamphetamine use among some populations in Australia, evidence of combined methamphetamine–fentanyl use may suggest that fentanyl use could accelerate if it became more widely available.

These results provide an early warning of possible unintended fentanyl use in Australia, particularly among people who use other illicit drugs. The study also provides evidence of the combined use of fentanyl and methamphetamine, which may represent intentional use of fentanyl to ease withdrawal symptoms or to produce an intense high. It has been argued Australia is unlikely to follow the trajectory of fentanyl misuse seen in North America due to key differences in these illicit drug markets (Brown & Morgan 2019). This study reinforces the need for prevention strategies specific to the Australian context in targeting fentanyl availability, patterns of use and harms.

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16. Fentanyl availability on darknet markets

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Introduction

The convergence of anonymous online illicit darknet markets (or cryptomarkets) and cryptocurrencies such as Bitcoin has created an efficient retail platform for illicit markets, including potent new synthetic opioids such as fentanyl. As only small quantities of these new drugs are needed to pass border and customs barriers, a revolution in the distribution of illicit drugs is occurring.

The United Nations illicit drug user surveys and police seizures also suggest drug usage, especially of amphetamine-type stimulants, synthetic opioids and other new psychoactive substances (NPS) is on the rise (United Nations 2018). Illicit drugs, including fentanyl and its analogues, are widely available via darknet e-commerce markets, and online vendors use postal services to distribute small quantities of fentanyl and other highly potent synthetic opioids (Pardo et al. 2019: 70). A mere 16.8 milligrams of fentanyl extracted from a 100-microgram transdermal patch purchased on the street in Australia (valued at between A\$75 and A\$450 per patch) could produce 5.5 grams of heroin equivalent, valued at between A\$1,100 and A\$3,850. Ten grams of fentanyl purchased on the darknet for A\$1,000 could produce the equivalent of one kilogram of synthetic heroin, valued at between A\$160,000 and A\$195,000 in the domestic illicit market, making the Australian drug market among the most expensive in the world (Australian Criminal Intelligence Commission 2019).

A substantial share of internet traffic in the encrypted 'deep web' accesses darknet markets such as Berlusconi or Dream, which specialise in the sale and distribution of contraband (Al-Nabki et al. 2019; Moore & Rid 2016). Typical products offered include illicit drugs, pharmaceuticals, fraudulent identity documents, malware and hacking kits, counterfeit goods and weapons. Europol estimates that two-thirds of the products listed on darknet markets between 2011 and 2015 were drug related and that these markets are 'one of the engines of organised crime' in Europe (European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) & Europol 2017: 15).

Search engines such as Google and Bing cannot access the darknet. Darknet markets are commonly accessed via 'Tor', which operates an overlay network of anonymous servers (onion routers), masking the original IP address of the user. Anonymity is further ensured by the use of cryptocurrencies such as Bitcoin or Monero for electronic payments (Saleh, Qadir & Ilyas 2018). Darknet markets are vulnerable to distributed denial-of-service attacks, exit scams (where a business stops completing orders but continues to accept payment for new orders), voluntary closures, and occasionally hacks, de-anonymisation, or seizure by law enforcement (EMCDDA & Europol 2017: 8). Markets are typically short lived, with many operating for less than 12 months (EMCDDA & Europol 2017: 16), but others such as Dream Market and Tochka (both included in this study) have operated since 2013 and 2015 respectively.

Darknet markets mimic conventional e-commerce services, having three main actors: vendors, buyers and market administrators. Buyers can leave reviews, send messages to vendors and dispute transactions. Vendors give product descriptions and basic details such as quantities, prices and shipping services. Administrators typically receive a commission of between three and eight percent from each sale and provide escrow services and overall supervision of the website and market operation (Broadhurst et al. 2018). For example, we observed that Dream charged a US\$300 (A\$420) vendor bond, received a four percent commission on sales, and required payments in Bitcoin or other cryptocurrencies via an escrow service.

Fentanyl has entered illicit drug markets worldwide, leading to an opioid epidemic in North America (National Institute on Drug Abuse 2019). Fentanyl is easy to modify, which has led to the production of many derivatives, such as the highly potent 3-methylfentanyl and carfentanil (Schueler 2017). The potency of different opioids is measured relative to morphine's effectiveness as a pain suppressant. Fentanyl is reported to be 50 to 100 times stronger than morphine, depending on user tolerance and purity. The derivative carfentanil, the active ingredient in Wildnil (a tranquilliser approved for veterinary use) is distinguished by its extraordinary potency and is estimated to be at least 10,000 times stronger than morphine. A fatal dose of fentanyl can be as little as two milligrams—the equivalent of four grains of salt—but a fatal dose of carfentanil is invisible to the naked eye. Carfentanil is cheaper than heroin and about 1/3300th the bulk of a dose-equivalent weight of heroin. A dose of 20 micrograms (ie 0.02 milligrams) is likely fatal (Schueler 2017; World Health Organization 2017). Fatalities have also been caused by the consumption of counterfeit pharmaceutical pills containing fentanyl, as well as fentanyl-laced heroin, cocaine and other NPS (eg U-47700; World Health Organization 2017).

Darknet markets enable a global trade in fentanyl from various sources, including diversion from pharmaceutical manufacture, clandestine production and prescription medication. The presence of fentanyl on darknet markets makes it relatively easy to acquire in a variety of physical forms. Fentanyl's potency allows it to be shipped in significantly smaller quantities than other opioids. This makes it attractive to vendors, who specialise in stealth packaging and use commercial postal and courier services. The massive volume of mail now generated by e-commerce offers camouflage for suspicious contraband and overwhelms postal inspection services (Australian Criminal Intelligence Commission 2019). These factors make it difficult to regulate the manufacture and distribution of fentanyl (O'Connor 2018).

The synthetic opioid revolution

The efficiency and anonymity of the illicit digital economy has combined with a well-organised and lucrative trans-Pacific contraband trade with global reach. Precursor chemicals for amphetamine-type stimulants, opioids and NPS are diverted or clandestinely manufactured in China and India, and shipped into North America via Mexico. Chinese and South American crime groups dominate the supply of these illicit products and have adapted to the opportunities offered by darknet markets (Broséus et al. 2017). The impact of cheaper 'China White' (heroin laced with fentanyl) on the large North American heroin supply chain has increased the risk of overdose deaths and simultaneously reduced the value of opium production in Mexico (Le Cour Grandmaison, Morris & Smith 2019). Consequently, transnational organised crime groups facilitate the global supply of cheaper synthetic opioids to meet the demand for pain relief and escapism (Broadhurst 2017; Hamilton 2016).

The scale of this illicit market can be gauged by recent seizures. In January 2019, 115 kilograms of fentanyl estimated to be worth US\$3.5m (A\$4.9m), or about US\$30,500 (A\$42,700) per kilogram, was seized at the US–Mexico border (Schwartz 2019). In August 2019 a massive 23,368-kilogram shipment of fentanyl originating in Shanghai and destined for the Sinaloa crime cartel was seized by Mexican customs and naval authorities at the port of Lázaro Cárdenas (Morgan 2019). Clandestine synthetic opioid laboratories operating in Mexico have also been found, suggesting that the importation of fentanyl precursors and the local production of fentanyl are an emerging trend (Le Cour Grandmaison, Morris & Smith 2019).

The United States Drug Enforcement Administration explained the attraction of these synthetics over traditional opioids, and especially the substitution or adulteration of heroin with fentanyl, in a guide for first responders:

...criminal organizations can use one kilogram of fentanyl to produce approximately 1 million (1 milligram) counterfeit pills, resulting in potentially 10-20 million dollars in revenue. There are also reports that consumers in some areas are seeking fentanyl over heroin, as the “rush” is greater. (US Drug Enforcement Administration 2017: 7)

Ciccarone, Ondocsin and Mars (2017: 152) noted a range of views among a sample of 38 heroin users, including concerns about fentanyl's overdose risk and short duration but also the ‘rush’ and its ‘potency in overcoming their heroin tolerance’. They reported that some users believed the heroin–fentanyl mix was ‘the ideal opioid with the fentanyl providing intensity and the heroin a longer lasting effect for the “best of both worlds”’. Drugs as diverse as cocaine, Xanax and MDMA are also testing positive to fentanyl, although reports on the purity of opioids and other illicit drugs sold on darknet markets are limited (National Institute on Drug Abuse 2019; Quintana et al. 2017).

In the United States overdose deaths from prescription opioids have quadrupled since 1999 (Volkow & Collins 2017). Of the estimated 70,237 overdose deaths in 2017, 47,600 were synthetic opioid related (Centers for Disease Control and Prevention 2019; Hedegaard, Miniño & Warner 2018). The increase in overdose deaths in the United States has been attributed to the widespread use of prescription opioids for chronic pain management—and an increase in opioid prescriptions has also been observed in Australia (Brown & Morgan 2019). The Australian Bureau of Statistics (2017) reports drug-induced deaths have been increasing since 2011, with 1,808 recorded deaths in 2016 and prescription drugs causing the highest number. Such a high rate of drug-induced fatalities has not been recorded since the heroin epidemic of the late 1990s.

However, there is little evidence of widespread misuse of fentanyl in Australia, either among police detainees (Sullivan & Patterson 2018) or those using heroin at the Sydney injecting centre (Barratt et al. 2018). Australia may be at the start of an opioid epidemic driven by access to synthetic opioids including fentanyl both on the street and online (Rodda et al. 2017) but has the advantage of being able to adapt supply, demand and harm reduction policies and practices (Brown & Morgan 2019).

The role of the darknet in drug supply

The National Drug and Alcohol Research Centre monitored drug trends on darknet markets between July and December 2016 and found that AlphaBay (closed by law enforcement in May 2017) and Dream Market were the largest darknet markets and the most widely available drugs were cannabis, pharmaceuticals, MDMA, cocaine, methamphetamine and NPS (Roxburgh et al. 2017). The same study noted the growing presence of the opioid analgesic analogues U-47700 and furanylfentanyl and the need to monitor the emergence of opioid analogues on darknet markets, given seizures of carfentanil and furanylfentanyl at the Australian border (Roxburgh et al. 2017).

In October 2015, China designated the previously unregulated NPS alpha-PVP ('flakka') as a controlled substance and placed restrictions on its export, along with another 115 chemicals used to make synthetic drugs without any legitimate medical or other use (O'Connor 2017). In March 2017 China introduced further regulation of NPS—notably fentanyl and the more potent carfentanil—following alarming increases in deaths caused by these opioids (O'Connor 2018). In May 2019 further restrictions were placed on the manufacture of fentanyl and its precursors (NPP and 4-ANPP) including criminal penalties and, in September 2019, oxycodone was listed as a psychotropic, restricting its production and prescription (Reuters 2019). Prior to these regulations several laboratories in China were reportedly selling carfentanil for US\$2,750 per kilogram; the drug was also available on the darknet for between US\$800 and US\$2,500 per gram (Misailidi et al. 2018). An unintended effect of regulatory enforcement in China has been the displacement of production to less regulated states (Broadhurst 2017).

Australians are active on darknet markets. Interviews conducted as part of the Australian Ecstasy and Related Drugs Reporting System included questions about online purchases from a darknet market. In 2017, 22 percent of psychostimulant users surveyed had purchased an illicit drug online in their lifetime, with 16 percent reporting they had done so in the past 12 months (Uporova et al. 2018). This was an increase from 18 percent (14% in the past year) in 2016 and 14 percent (10% in the past year) in 2015 (Stafford & Breen 2016; Uporova et al. 2018). The vast majority of those surveyed in 2017 (93% compared to 85% in 2016) reported having knowledge of these markets (Uporova et al. 2018).

Aim

This study estimates the availability of fentanyl and other synthetic opioids on a sample of general or omnibus Tor darknet markets between 2 January and 27 March 2019. It extends the description of fentanyl availability previously reported for 2 January to 23 February (Ball, Broadhurst & Trivedi 2019).

Method

Data were collected from several Tor websites with a focus on fentanyl products. Data were collected over 84 days (from 2 January to 27 March 2019) from 64 'scrapes' of six omnibus darknet markets: Berlusconi, Dream Market, Empire, Tochka, Valhalla ('Silkkitie') and Wall Street. Each of these markets posted at least 1,000 products across different contraband categories. We report only unique products listed daily by each vendor, excluding repeat listings of the same product where this occurs on each market. The relevant ethical protocol (Australian National University: 2019/498) for this study required that we not conceal our data collection. We provided the means for market operators to contact us via the agent string identifier found on standard crawlers, but none has done so.

Given that the number of darknet markets operating in Tor is unknown and estimates of hidden criminal services vary, the selected darknet markets may not be representative of darknet markets as a whole. Al-Nabki et al. (2019: 217) identified 20 percent of 10,367 known Tor sites as 'suspicious' or criminal and 48 percent as 'normal' (hosting and cryptocurrency services), while 32 percent were classified as unknown because they were unavailable, empty or locked. Defunct sources such as the online darknet 'information centre' Deep Dot Web (see Ladegaard 2019) listed 40 to 50 markets as being active in early 2019, of which a dozen were omnibus (Gilbert & Dasgupta 2017: 162).

All markets except Berlusconi experienced some downtime over the data collection period. Valhalla ceased operations in February when its operators were arrested (Europol 2019). Dream Market was subject to sustained distributed denial-of-service attacks from mid-February to mid-March, first temporarily suspending services and then opting for a 'soft exit' from 27 March 2019 (ie an orderly closure rather than an 'exit scam', where market operators steal escrowed funds). Dream Market banned the sale of fentanyl in June 2018 but was included in this study because it was the largest market identified and because fentanyl and other 'forbidden products and services' may still be listed occasionally (eg assassinations, weapons, poisons, child pornography and videos of people being hurt or murdered).

Data was captured from websites using 'crawler' and 'scraper' technologies commonly used in the open net and widely used since the 1990s. These tools are designed to automate the data capture and extraction process. A crawler is an automated script designed to search an entire website in a methodical manner and find as many unique pages as possible. This crawling process creates a static copy of the websites for later analysis. These copies record the time at which the data was captured, as well as retaining the structure of the page, allowing researchers to navigate the static site as if browsing in real time (Christin 2013). This is crucial in the case of volatile darknet markets. A scraper extracts or 'scrapes' data from HTML pages. This data is exported to a comma-separated value file that statistical programs (eg Stata, SPSS) can import and use for analysis. Web crawlers designed to function in Tor capture details of products, prices and vendors. They also circumvent defences designed to prevent distributed denial-of-service attacks, a common way to disrupt a market competitor. Most darknet markets use 'CAPTCHA' logins (Completely Automated Public Turing test to tell Computers and Humans Apart) that restrict botnet and automated browser activity and limit the number of webpages or product listings a visitor may access in a single session.

Analysis of the products available on darknet markets was limited to those the vendors claimed were fentanyl, and the availability of this and other synthetic opioids on these markets is therefore likely to be under-reported. Only products labelled as fentanyl or its derivatives were included in this analysis. Products listed under colloquial names (eg 'Apache', 'China White', 'Bear', 'TNT'), whose potency and chemical composition are unknown, are excluded, although we note their presence and that of the fentanyl-like NPS U-47700 and its derivatives. In this study we focus on availability and do not estimate the weight sold drawing on customer reviews or the number of transactions listed by vendors or markets (eg Kruithof et al. 2016). Not all darknets show reviews or sales tallies, and repeated daily observations suggest vendors and market operators are probably gaming these systems. Further details of the data capture methods, limitations and estimates of weights and prices are provided in a technical report (Ball, Broadhurst, Niven & Trivedi 2019).

Results

Table 1 describes the number of products (broadly classified) available over the first three months of 2019. Almost half the products listed (49%) were drugs, of which ten percent (10.3%) were opioids. Fentanyl accounted for over eight percent (8.5%) of the opioids listed. Dream Market accounted for the majority of products, drugs and opioids available, although most of the fentanyl available was found on Wall Street. Two weeks after the end of data collection, on 12 April 2019, Wall Street was disabled and its operators arrested as a result of a joint US–Europol criminal investigation (Europol 2019).

An earlier snapshot (Ball, Broadhurst & Trivedi 2019) based on 36 'scrapes' or daily observations (2 January–23 February 2019) identified 439 fentanyl products (0.347% of all drugs). With 28 additional daily observations, 1,118 fentanyl listings were identified (0.876% of all drugs).

Table 1 shows that well-known darknet markets are an avenue for distributing synthetic opioids such as fentanyl and other high-value, low-mass NPS. The number of listings is insignificant compared with those of other drugs such as cannabis, cocaine and amphetamine-type stimulants, but the potency of fentanyl amplifies the likely impact.

Table 1: Market share by all unique products, drugs, opioids and fentanyl listings

Market	Unique listings <i>n</i> (%)	Drugs <i>n</i> (%)	Opioids <i>n</i> (%)	Fentanyl <i>n</i> (%)
Berlusconi	47,351 (18.25)	15,649 (12.27)	412 (3.14)	87 (7.78)
Dream	167,079 (64.41)	89,753 (70.37)	8,572 (65.26)	48 (4.29)
Empire	10,394 (4.01)	3,217 (2.52)	205 (1.56)	36 (3.22)
Tochka	4,400 (1.69)	2,208 (1.73)	518 (3.94)	48 (4.29)
Valhalla	10,765 (4.15)	7,110 (5.57)	262 (1.99)	45 (4.03)
Wall Street	19,403 (7.48)	9,604 (7.53)	3,166 (24.10)	854 (76.39)
Total	259,392	127,541	13,135	1,118

Note: 'Unique Listings', 'Drugs' and 'Opioids' are based on the listings found on all markets (2 January to 27 March 2019). Percentages refer to column totals. Percentages may not total 100 due to rounding. Valhalla ceased on 13 February 2019, Dream Market ceased on 26 March 2019, and Wall Street ceased on 12 April 2019

Products, prices and weights

Over three-quarters of the available fentanyl products were listed on Wall Street ($n=854$, 76%), followed by Berlusconi ($n=87$, 8%). Despite Dream Market's ban on fentanyl sales, 48 listings (4%) were found, equal to the number of listings found on Tochka, followed by Valhalla ($n=45$, 4%) and, finally, Empire ($n=36$, 3%).

Over the observation period, at least 27.31 kilograms of fentanyl products were available to buyers. For one in four fentanyl products listed ($n=282$, 25%), vendors did not provide weight values or the number of tablets or patches. Adjusting for these missing values by using the mean weight of known listings as proxy values leads to an upper estimate of 39.3 kilograms. This is likely an underestimate because, as noted, only products labelled as fentanyl were included. For example, 290 products with a total weight of approximately 7.76 kilograms were listed under the colloquial name 'China White' and were probably laced with fentanyl. In addition, 25 proprietary prescription fentanyl products were identified, including 18 Sandoz, five Duragesic and two Actiq lozenges with a total weight of 0.318 grams. Two of these products were listed on Dream Market. Ten kilograms of U-47700 (and derivatives) were also estimated to be available across the six markets.

Of the 13,135 opioids listed, 846 (6.44%) were partial opioid agonists. The presence of opioid agonists such as methadone ($n=492$, 3.74%), buprenorphine ($n=288$, 2.19%) and naloxone ($n=72$, 0.55%) suggests there is user demand for harm reduction and self-medicated recovery.

Table 2 shows the number of unique listings of different opioids, the estimated average price per gram and the lower estimates of the available quantities in kilograms. Heroin and oxycodone accounted for half all the opioids listed, followed by tramadol, fentanyl, codeine and morphine. Opium and the partial opioid agonists methadone and buprenorphine are also listed on most markets. Based on the estimated overall weight, oxycodone accounts for eight percent of all opioids, indicating numerous listings of smaller quantities, whereas tramadol (18%) and fentanyl (15%) account for a larger share of the available opioids.

Table 2: Opioids available on darknet markets, by type of opioid

	Unique listings	Market share: % of listings	Weight in kilograms	Market share: % weight	Average price per gram (A\$)
Heroin	4,839	36.25	69.76	37.5	115.06
Oxycodone	3,169	23.74	14.41	7.76	1,931.77
Tramadol	1,525	11.42	32.58	17.54	459.62
Fentanyl ^a	1,118	9.95	27.31	14.70	91.92
Codeine	827	6.20	25.95	13.97	277.57
Morphine	591	4.43	6.52	3.51	518.90
Methadone	492	3.69	6.80	3.66	839.12
Opium	290	2.17	1.64	0.88	48.95
Buprenorphine	288	2.16	0.79	0.42	4,057.56

a: Includes all fentanyl analogues

Note: Weight values are all lower estimates (unweighted for missing values)

The average price of fentanyl was calculated excluding extreme outliers (eg vendors offering free samples or charging extremely high prices for ‘pure’ product). Vendors typically sell fentanyl in small quantities—micrograms or milligrams—but offerings in grams and occasionally kilograms are also observed. Table 3 compares the physical forms, the average price per gram and overall quantities found in the six markets. For comparison, the street price in New South Wales of a 100-microgram patch of fentanyl is estimated to range from A\$75 to A\$450, with the average darknet price occurring at the lower end of this range, noting that street prices vary by location (Australian Criminal Intelligence Commission 2019). Fentanyl patches or powder were priced at an average of A\$99 per gram across the six markets, with more potent derivatives averaging lower prices of A\$20.50 to A\$26.80.

Average prices across vendors and markets were volatile during the observation period. The price of fentanyl increased from A\$79 to A\$99 per gram between January and March 2019. Average prices for fentanyl analogues generally declined since those for February 2019 were reported by Ball, Broadburst and Trivedi (2019); for example, the price of carfentanil was estimated to be A\$300 per gram but was less than 10 percent of this price (A\$26.8) by the end of March 2019. This dramatic change is attributed to the subsequent increase in available stock, especially on Wall Street, and the common vendor practice of significantly raising prices when supply is low. We removed these extreme outliers for the estimates reported in Table 3.

Of the 1,118 fentanyl products in the dataset, 507 did not describe the physical form. The remaining 611 came in the form of pills, patches, powder, solutions, blotters and sprays. Patches and powder accounted for about 88 percent of the physical forms after adjusting for missing values.

Table 3: Total estimated weight and unit prices of fentanyl and analogues

	Potency relative to morphine ^a	Weight (kilograms)	Market share (%)	Average price per gram (A\$)	Common physical forms
Fentanyl	80 – 100×	12.63	46.24	98.97	powder, patches
Carfentanil	10,000 – 100,000×	8.05	29.49	26.79	powder, solution
Furanylfentanyl	20×	4.01	14.67	55.15	powder
Methylfuranylfentanyl	400 – 500×	2.16	7.93	20.50	powder
Methoxyacetylfentanyl	50 – 100×	0.44	1.61	8.47	powder
Methoxyacetylfentanyl	50 – 100×	0.44	1.61	8.47	powder

a: National Institute on Drug Abuse 2019; Schueler 2017

Vendors

We identified 9,713 unique vendors (determined by the ‘handle’, path-name or PGP key) across the six darknet markets surveyed. Among these, 303 vendors (3%) were identified as selling fentanyl, but only nine of these operated in multiple markets. On average, each vendor offered 86.98 grams of fentanyl, with half (the median) offering less than 35.15 grams. Twelve vendors (4%) offered at least 1,000 grams each, and accounted for 80 percent of all the available fentanyl. Among fentanyl vendors, 98 (32%) offered worldwide shipping (including to Australia), but another 113 vendors (37%) did not provide details about shipping services. Another 88 vendors (29%) were banned from selling on one of these markets during the course of our study. They may have been removed for selling banned products or scamming their customers.

Over a third ($n=114$, 38%) of vendors sold carfentanil and 11 (4%) sold methylfuranylfentanyl, both of which are more potent than fentanyl. From the data available, it is possible that several Australian-based fentanyl vendors are operating in these markets. Most vendors appear to be generalists, listing many types of drugs. However, several vendors specialise in fentanyl and carfentanil, often selling significantly larger quantities of these drugs.

Discussion

These findings suggest that fentanyl may have growing significance in darknet markets. Broséus et al. (2017) analysed the Evolution darknet market between 2014 and 2015 and identified 92,980 products and 4,171 vendors, reporting that 63 percent of listings were illicit drugs (cannabis was the most commonly available) and opioids accounted for four percent of all drug listings. Of the 4,500 opioid products (9% of all drugs) for sale on Dream Market in September 2017, 10 percent comprised fentanyl, 29 percent heroin, 16 percent oxycodone, seven percent morphine, seven percent opium, five percent codeine, and five percent buprenorphine (Broadhurst & Lord 2017).

Monitoring the evolution of darknet markets is required to understand how they shape trends in recreational and dependent drug use. Overdose spikes resulting from specific sources may go unnoticed without the appropriate medical and policing response (Roxburgh et al. 2017). A better understanding of the business models, tradecraft and criminal networks involved could assist in targeting vendors and informing cross-border law enforcement strategies. The ascent of a ‘gentrified’ retail model of drug trade and its harm reduction potential also warrants attention. Martin (2017) notes that the upsides of darknet drug markets include product purity, information about safer options and fewer threats of violence (see also Barratt, Ferris & Winstock 2016).

Despite the limited scale and duration of this data collection, a small but significant fentanyl market was identified on the darknet, including unexpected quantities of carfentanil (30% of all fentanyl products). A fatal dose of fentanyl is two milligrams, while a usual dose is 0.2 milligrams (200 micrograms). So the lower estimate of 27.31 kilograms corresponds to 9.558 million lethal doses or 95.588 million typical doses of fentanyl. Adjusting for carfentanil's higher potency (0.02 milligrams is likely fatal, and 0.002 milligrams or 2 micrograms is sufficient to induce a heroin-like effect), we estimate 409.665 million fatal doses and perhaps 4.096 billion typical doses were available. Such highly potent drugs have the potential to be weaponised by crime groups and violent extremists.

Almost one-third (30%) of the estimated 27.3 to 39.3 kilograms of fentanyl products for sale were the extremely potent carfentanil analogue, in solution or powder form. Fentanyl is typically sold in very small quantities (micrograms or milligrams) as patches or powder, but several vendors who specialise in fentanyl products also offer quantities of 5–10 grams or more. Further monitoring of darknet markets could reveal niche markets that arise as larger omnibus markets become increasingly wary of the unwanted attention fentanyl invites from law enforcement agencies. During the course of this study, Empire and Berlusconi joined Dream Market in discouraging fentanyl listings.

On 16 April 2019, a transnational policing operation removed Wall Street, the major market for fentanyl, by arresting its German and Brazilian based operators (Europol 2019). The impact on the online availability of fentanyl may be short lived and displacement to other darknet markets is likely (Ladegaard 2019). In the post-Wall Street darknet 'universe' we observed a sharp decline in the availability of fentanyl, and only one of our selected markets, Tochka, continues to explicitly permit vendors to offer fentanyl and its derivatives. Some vendors displaced from Wall Street shifted operations to Empire or Berlusconi (or to other markets such as Nightmare and Agartha not included in this study). Although fentanyl listings appear to have been dispersed, many more fentanyl listings have subsequently been observed on Tochka.

Conclusion

Darknet markets attract criminal entrepreneurs due to their efficiency and secrecy, and are proving to be near ideal platforms for the distribution of high-value, low-mass synthetic opioids. New synthetic opioids and other NPS redefine the traditional limits of high-value, low-volume or low-value, high-volume crime because small quantities of highly potent drugs can be posted or shipped across frontiers with a frequency that recalls the Chinese idiom 'ants moving houses'.

Novel ways to disrupt darknet operations and undermine the impunity of the criminals involved are needed. Proactive 'fear, distrust and disruption' activities are one means for law enforcement to suppress supply (Moeller, Munksgaard & Demant 2017). Undercover police operations or other means of disabling a market and arresting key players—as was the fate of Silk Road, AlphaBay, Hansa, Valhalla and Wall Street—can increase the perceived risk of arrest and help to reduce the scale of these illicit markets.

Perhaps unable to escape the uptake of synthetic opioids, Australia still has time to prepare and respond to the challenges of another dangerous drug. While public health and medical responses such as overdose reversal, addiction treatment, use of abuse-avoidant opioids and pain management are vital, so too will be a concerted effort to suppress supply and educate recreational drug users (Volkow & Collins 2017). Australia's universal health care and emerging harm reduction responses may help reduce the risk of overdose fatalities (Larance et al. 2018). Costly implications for health services and high risks for drug users, coupled with a boost in the profits of criminal enterprises, are nevertheless likely.

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17. Methamphetamine dependence and domestic violence among police detainees

Anthony Morgan and Alex Gannoni

Domestic violence—defined as acts of physical, sexual, emotional or psychological abuse between current or former intimate partners—directly affects large segments of the Australian community. Recent data show that around one in six women and one in 16 men have experienced physical and/or sexual violence by a current or former partner since the age of 15, while one in four women and one in six men have experienced emotional abuse (Australian Bureau of Statistics 2017). The social, health, psychological and financial costs of domestic violence to individuals, families and the broader community are significant (KPMG 2016).

However, the risk of domestic violence—perpetration and victimisation—is not evenly spread across all individuals and communities. Effective, evidence-informed interventions targeted at high-risk populations are key to reducing the enormous harms associated with domestic violence. A greater understanding of the risk factors for domestic violence offending is essential to the development of effective intervention and prevention strategies.

Domestic violence is the result of a complex interplay of risk factors operating at the individual, relationship, community and societal levels (Capaldi et al. 2012). Factors that have been shown to increase the risk of violence perpetration include being in late adolescence or young adulthood, socio-economic disadvantage, being a member of a minority group, financial and work-related stress, childhood experience of and exposure to violence, involvement with aggressive peers, conduct problems early in life, substance use, gender-inequitable attitudes, and relationship instability and conflict (Capaldi et al. 2012; Fulu et al. 2013). A recent meta-analysis of 35 longitudinal studies examining risk and protective factors for violence against women found the risk factors for victimisation with the strongest evidence were unplanned pregnancy and having parents who had not completed secondary school (Yakubovich et al. 2018). Conversely, being older, being married, and having positive parenting support and encouragement, high-quality peer networks and access to social support are all protective factors that reduced the likelihood of experiencing violence (Capaldi et al. 2012; Yakubovich et al. 2018).

The current study is focused on one of these risk factors—illicit drug use and, specifically, dependence on methamphetamine. Australian research has tended to focus on the role of alcohol (Hulme, Morgan & Boxall 2019), where the link with violence is well established (Leonard & Quigley 2017). Alcohol use is present in a significant proportion of domestic violence incidents and associated with more serious violence and an elevated risk of reoffending. Less is known about the role of illicit drugs in domestic violence offending in Australia (Hulme, Morgan & Boxall 2019). A recent Australian study by Coomber et al. (2019) found that survey respondents who had used illicit drugs in the previous 12 months were significantly more likely to experience any type of violence; that domestic and family violence incidents were significantly more likely than other violent incidents to involve drugs; and that drug involvement in domestic and family violence was associated with greater odds of injury and negative life impact.

International reviews have found that substance use, including alcohol and illicit drug use, is linked to domestic violence perpetration (Cafferky et al. 2018; Capaldi et al. 2012; Choenni, Hammink & van de Mheen 2017). However, the association is not straightforward, and may vary depending on substance type and broader contextual factors such as individual characteristics and social context (Choenni, Hammink & van de Mheen 2017; Moore et al. 2008). Findings of a systematic review by Capaldi et al. (2012) suggested that the association between illicit drug use and domestic violence may be stronger than for alcohol use.

However, it also appears that the *level* of illicit drug use influences the likelihood of domestic violence perpetration, rather than use in and of itself. In a meta-analysis of 96 studies, Moore et al. (2008) found that increases in drug use and drug-related problems were significantly associated with increases in aggression between intimate partners. In a more recent meta-analysis of 285 studies, Cafferky et al. (2018) found that measures of problematic drug use (abuse, dependence) were more strongly correlated with domestic violence perpetration than drug consumption measures (use, frequency). In other words, individuals who are dependent on drugs are much more likely to perpetrate domestic violence than individuals who use drugs but who are not drug dependent. This is because people who are dependent on drugs use drugs more frequently, leading to more frequent intoxication; they may also use drugs in higher doses and are more likely to experience withdrawal symptoms (Cafferky et al. 2018). These aspects of drug use all contribute to the increased risk of aggression and/or psychotic episodes and, in turn, the likelihood of violence towards an intimate partner.

Most studies exploring the link between drug dependence and domestic violence perpetration have focused on cocaine, cannabis and opioids, with mixed findings. Some have concluded that cocaine use disorders (abuse or dependence) are the strongest predictor of domestic violence perpetration (Crane et al. 2014; Smith et al. 2012), some have observed limited or no effects for non-stimulants like cannabis (Crane et al. 2014; Feingold & Capaldi 2014), while others have found less variation by drug type (eg Feingold, Kerr & Capaldi 2008). Cafferky et al.'s (2018) meta-analysis of studies that measured both use and problematic drug use found no difference between drug types in their relationship with domestic violence perpetration (or victimisation). They suggested this may be a consequence of individuals using both stimulants and other drugs (ie polydrug use).

The link between methamphetamine use and domestic violence is well established (Dowling & Morgan 2018), as is the highly addictive nature of the drug and the high rates of dependence among users (Watt et al. 2017). Few studies have focused specifically on whether methamphetamine dependence increases the risk of domestic violence perpetration, with inconsistent findings (see Watt et al. 2017). Given that rates of methamphetamine use and methamphetamine-related violence among criminal justice populations have continued to rise in Australia (Goldsmid et al. 2017; Patterson, Sullivan & Bricknell 2019), and that wastewater monitoring has found recent population-level increases in methamphetamine consumption (Australian Criminal Intelligence Commission 2019), further research into the relationship between methamphetamine dependence and domestic violence is warranted. Better understanding of this association, particularly among a sample of the Australian criminal justice population, can help to inform effective policy and programmatic responses.

Aim

This study aims to address the question: *Is there a relationship between methamphetamine dependence and domestic violence perpetration?*

The study builds on earlier research by Mouzos and Smith (2007), which identified several factors that increased the likelihood of involvement in domestic violence among police detainees, including drug and alcohol dependency, prior arrest, having dependent children, and experiencing physical abuse as a child. However, the measure of domestic violence used in that study did not distinguish between perpetration and victimisation. Furthermore, Mouzos and Smith (2007) considered dependency on any drug, while this study examines methamphetamine dependency.

Method

Sample

Data for this study were obtained from the Drug Use Monitoring in Australia (DUMA) program, in which interviews are conducted with police detainees quarterly at select police stations or watch houses across Australia, using a core questionnaire and varying addenda. The core questionnaire collects a range of demographic and drug use data. Quarterly addenda are developed to examine topical issues of policy relevance.

The interview is conducted by trained interviewers, independent from the police. Initial eligibility is assessed by the police officer in charge of the station or watch house, and detainees are approached by a police officer or interviewer and asked if they are willing to participate. Willing participants are then escorted to an interview room where they complete an informed consent process with the interviewer who then conducts the interview. Interviews take place during peak hours over a four-week period. For more detail on the DUMA program and its methodology, see Patterson, Sullivan and Bricknell (2019).

Detainees were asked to complete a *Domestic Violence* addendum along with the core questionnaire in the fourth quarter of 2012 in eight watch house locations: Adelaide, Bankstown, Brisbane, Darwin, East Perth, Footscray, Parramatta and Southport (note that DUMA continues to operate in a reduced number of sites). A total of 704 detainees completed the addendum questionnaire. Detainees were eligible for the current study if they reported having an intimate partner relationship in the 12 months prior to being interviewed. The nature of their intimate relationship was not identified (for example, whether they were in same-sex or opposite-sex relationships) nor whether they had had more than one intimate partner relationship over the 12 month time frame.

A total of 448 detainees were eligible for this study. Due to the relatively small number of female respondents ($n=70$), and the focus of this study on male perpetrated domestic violence, female detainees were excluded. Twenty-seven detainees were also excluded because information on key independent variables was missing. This resulted in a final sample size of 351 male detainees.

Variables

Domestic violence perpetration

Respondents were asked about 11 behaviours that fall within the definition of domestic violence (see Table A1), and whether they had done any of these things within the previous 12 months. These behaviours included physical violence (eg hitting or kicking a partner), threatened violence or property damage, emotional and verbal abuse (eg isolating or verbally humiliating a partner), and controlling behaviours (such as not letting a partner socialise with family or friends).

A respondent was classified as a domestic violence perpetrator if he reported committing at least one of the 11 acts of domestic violence in the previous 12 months. Sexual abuse was not included in the measure of domestic violence for this study, primarily due to ethical considerations.

Demographic characteristics, mental illness and criminal justice contact

Respondents were asked to provide basic demographic information including age, Indigenous status, education level, employment status and number of dependent children. Respondents were also asked whether they had ever been diagnosed with a mental illness. In addition, respondents were asked to provide basic information on prior contact with the criminal justice system, including prior arrest, prior juvenile arrest, prior prison history, and imprisonment in the last 12 months.

Daily alcohol use

Respondents were asked to indicate the number of days in the past month they had consumed alcohol. Daily alcohol use was defined as alcohol consumption on 28 days or more in the previous month.

Illicit drug use and dependence

Illicit drug use was assessed based on responses to a question about self-reported drug use in the previous 12 months. Dependence was assessed based on responses to the question: '*In the last 12 months have you ever felt that you needed or were dependent on [DRUG]?*' These questions were asked separately for cannabis, methamphetamine, cocaine, heroin, illegal morphine, ecstasy, hallucinogens, illegal benzodiazepines and inhalants. Due to the relatively small number of respondents who reported dependence on cocaine ($n=4$), heroin ($n=19$), illegal morphine ($n=12$), ecstasy ($n=2$), hallucinogens ($n=10$), illegal benzodiazepines ($n=1$) and inhalants ($n=1$), responses about use of and dependence on these substances were combined. Twenty-eight percent ($n=34$) of all detainees who reported being dependent on at least one drug were dependent on multiple substances.

Attitudes to violence against women

Respondents were asked whether they thought domestic violence was ever okay in 14 different scenarios (see Table A2). These items were then aggregated into five measures of violence-supportive attitudes—condoning defending oneself or others, excusing violence, justifying violence, minimising violence, and shifting responsibility to the victim. These violence-supportive attitudes were adapted from the 2009 National Community Attitudes towards Violence Against Women Survey (VicHealth 2010).

Analysis

The analysis was undertaken in two stages. First, the relationship between explanatory variables and self-reported domestic violence was examined using chi-square tests of independence. These are used to determine whether there is an association between two categorical variables. It compares the observed frequency (eg the prevalence of self-reported domestic violence among individuals who have or have not recently used illicit drugs) with the expected frequency; the latter being the expected value if there was no relationship. The chi-square test determines the probability that these results occurred by chance. For variables with three categories (eg drug use and dependence), standardised adjusted residuals were analysed to determine which of the observed frequencies differed from the expected frequencies.

The second stage of the analysis involved using a multivariate logistic regression model to measure the association between methamphetamine dependence and recent self-reported domestic violence, while controlling for other variables. The adjusted odds ratios (AOR) allow us to quantify the strength of the relationship between each independent variable and domestic violence. They represent the odds of domestic violence being observed when a particular variable is present, compared with the odds when the variable is not present, all other variables remaining constant.

Limitations

First, as this study is based on cross-sectional data, a causal relationship between drug dependence and domestic violence perpetration cannot be established. Second, the prevalence of drug use and dependence and domestic violence perpetration may be under-reported, because some detainees may be reluctant to admit drug use, dependency or domestic violence perpetration during an interview. Third, detainees' drug dependence was measured using a single-item question, rather than a validated, multi-item measure. Screening for substance use disorders for all drug types in a custodial setting using a multi-item measure was not feasible (particularly as the primary aim of DUMA is to monitor drug market trends). Replicating the current study using a substance use disorder screening instrument validated for criminal justice populations, such as the Drug Use Disorders Identification Test (Hildebrand 2015), may be warranted. Fourth, the findings are specific to police detainees and cannot necessarily be generalised to other populations. Recent Australian research has shown that illicit drug use is a risk factor for domestic violence among the general population (Coomber et al. 2019), but further research is needed to understand the relationship between domestic violence and drug dependence among Australian non-criminal justice samples.

Finally, the data used for this study were collected several years ago. While there is no reason to believe that the relationship between methamphetamine use and violence has changed since this questionnaire was administered, the use of methamphetamine among police detainees—and the rate of dependence—has increased significantly. Further research is needed to determine whether there have been changes in the profile of detainees who use and are dependent on methamphetamine that might have implications for how we respond to detainees who have substance use disorders and a recent history of domestic violence.

Results

Thirty-seven percent ($n=130$) of detainees reported having perpetrated at least one act of domestic violence towards a current or former partner in the previous 12 months—twenty-five percent ($n=86$) had threatened violence and/or property damage, 23 percent ($n=82$) had been psychologically or emotionally abusive, 17 percent ($n=60$) had been physically violent, and 15 percent ($n=51$) reported controlling behaviour.

The first stage of the analysis examined the bivariate relationships between demographic characteristics, criminal justice contact and substance dependence and self-reported domestic violence against a current or former partner in the previous 12 months. As shown in Table 1, detainees who had previously been arrested were significantly more likely than those who had not to self-report domestic violence (45% vs 30%; $\chi^2(1)=8.17$, $p<0.01$). Detainees who were unemployed were also more likely to self-report domestic violence (46% vs 31%; $\chi^2(1)=7.72$, $p<0.01$).

There was a significant association between methamphetamine dependence and self-reported domestic violence ($\chi^2(2)=13.37$ $p<0.01$). Detainees who reported being dependent on methamphetamine (61%) were more likely than detainees who had used methamphetamine but were not dependent (37%) and detainees who had not used methamphetamine (32%) to report recent violence towards a current or former intimate partner.

There was also a significant association between cannabis dependence and self-reported domestic violence ($\chi^2(2)=25.40$ $p<0.001$). Detainees who reported being dependent on cannabis (58%) were more likely than detainees who had used cannabis but were not dependent (41%) and detainees who had not used cannabis (25%) to self-report domestic violence. A small number of detainees reported both methamphetamine and cannabis dependence ($n=13$)—all but one of these detainees reported having perpetrated domestic violence in the previous 12 months.

Table 1: Bivariate relationships between explanatory variables and self-reported domestic violence perpetration in the last 12 months

	Total (n)	Perpetrator (%)	Non-perpetrator (%)	p value
Age				
25 or less	140	36	64	0.707
26–35	118	40	60	
36+	93	34	66	
Indigenous status				
Indigenous	51	41	59	0.508
Non-Indigenous	300	36	64	
Highest level of education				
Year 10 or less	130	42	58	0.180
Year 11 or higher	221	34	66	
Unemployed				
Yes	137	46	54	0.005**
No	214	31	69	
Dependent children				
Yes	99	32	68	0.252
No	252	39	61	
Ever been diagnosed with a mental illness				
Yes	122	43	57	0.070
No	229	34	66	
Previous arrest				
Yes	173	45	55	0.004**
No	178	30	70	
Arrested as a juvenile (<18)				
Yes	207	39	61	0.330
No	144	34	66	
Ever been in prison				
Yes	146	40	60	0.379
No	205	35	65	
Daily alcohol use				
Yes	31	48	52	0.171
No	320	36	64	

Table 1: Bivariate relationships between explanatory variables and self-reported domestic violence perpetration in the last 12 months (cont.)

	Total (n)	Perpetrator (%)	Non-perpetrator (%)	p value
Cannabis use and dependence^a				
Cannabis dependence	76	58	42	0.000***
Cannabis use (but not dependence)	110	41	59	
Has not used cannabis	165	25	75	
Methamphetamine use and dependence^a				
Methamphetamine dependence	44	61	39	0.001**
Methamphetamine use (but not dependence)	104	37	63	
Has not used methamphetamine	203	32	68	
Other drug use and dependence^b				
Other drug dependence	33	45	55	0.571
Other drug use (but not dependence)	87	36	64	
Has not used other drugs	231	36	64	
Used multiple illicit drug types^c				
Yes	150	43	57	0.059
No	201	33	67	

***statistically significant at $p < 0.001$, **statistically significant at $p < 0.01$

a: Limited to previous 12 months. Analysis of the standardised adjusted residuals indicated that, for both methamphetamine and cannabis, the observed frequency of self-reported domestic violence among detainees who did not use the drug was significantly lower than the expected frequency, while the observed frequency of self-reported domestic violence among detainees who were dependent on the drug was significantly higher than the expected frequency

b: Includes cocaine, heroin, illegal morphine, ecstasy, hallucinogens, illegal benzodiazepines and inhalants. Limited to previous 12 months

c: Refers to the use of two or more drugs (excluding alcohol) in the previous 12 months

Source: AIC DUMA collection [computer file]

The relationship between domestic violence supportive attitudes and self-reported domestic violence was also examined. As shown in Table 2, detainees who endorsed attitudes towards domestic violence that justified violence (51% vs 34%; $\chi^2(1)=7.53$, $p < 0.01$) and minimised violence (58% vs 33%; $\chi^2(1)=12.32$, $p < 0.001$) were significantly more likely than other detainees to report having been violent towards an intimate partner in the previous 12 months. There was no significant association between self-reported domestic violence and attitudes that condoned defending oneself and others, excused the violence, or shifted responsibility to the victim.

Table 2: Bivariate relationships between attitudes and self-reported domestic violence perpetration in the last 12 months

	Total (n)	Perpetrator (%)	Non-perpetrator (%)	p value
Condoning defending oneself and others				
Yes	307	37	63	0.814
No	44	39	61	
Excusing violence				
Yes	56	39	61	0.704
No	295	37	63	
Justifying violence				
Yes	68	51	49	0.006**
No	283	34	66	
Minimising violence				
Yes	53	58	42	0.000***
No	298	33	67	
Shifting responsibility to the victim				
Yes	28	39	61	0.797
No	323	37	63	

***statistically significant at $p < 0.001$, **statistically significant at $p < 0.01$

Source: AIC DUMA collection [computer file]

A multivariate logistic regression model was then used to measure the association between methamphetamine dependence and domestic violence perpetration in the previous 12 months, while controlling for other variables. The dichotomous dependent variable was whether a detainee had perpetrated at least one act of domestic violence against a current or former partner in the previous 12 months (yes or no). Significant variables ($p < 0.05$) and other potential confounders (with a p -value cut-off point of 0.25) were included in the model. The overall model was significant ($\chi^2(12) = 58.66$, $p < 0.001$), the Cragg–Uhler (Nagelkerke) R^2 was 0.210 and the Area Under the Curve was 0.73, indicating the model was a good fit for the data (Hosmer & Lemeshow 2000). There were no issues with multicollinearity.

As shown in Table 3, even after accounting for other variables, methamphetamine dependent detainees (AOR=3.26 (CI 1.49 – 7.12, $p < 0.01$)) were significantly more likely to self-report having been violent towards a current or former intimate partner than detainees who had used methamphetamine but were not dependent. Similar patterns were observed for detainees dependent on cannabis (AOR=1.96 (CI 1.04 – 3.70, $p < 0.01$)). There was no difference between detainees who had used methamphetamine but were not dependent and those who had not used methamphetamine; however, detainees who had not used cannabis in the previous 12 months were significantly less likely than detainees who had used cannabis but were not dependent to self-report domestic violence (AOR=0.40 (CI 0.21 – 0.75, $p < 0.01$)).

Detainees who had used multiple illicit drug types were less likely than those who had consumed one type of drug or no drugs in the previous 12 months to self-report domestic violence (AOR=0.41 (CI 0.19 – 0.92, $p<0.05$)). Further, detainees who expressed attitudes minimising the severity of domestic violence were more likely to self-report domestic violence, controlling for other variables (AOR=2.41 (CI 1.18 – 4.91, $p<0.05$)).

Table 3: Logistic regression model predicting domestic violence perpetration ($n=351$)

	Adjusted odds ratio (95% CI)	p value
Educated to year 10 or less	0.93 (0.57 – 1.55)	0.793
Unemployed	1.45 (0.88 – 2.38)	0.148
Ever been diagnosed with a mental illness	1.26 (0.76 – 2.08)	0.375
Previous arrest	1.42 (0.85 – 2.35)	0.178
Daily alcohol use (past 30 days)	1.99 (0.88 – 4.51)	0.100
Cannabis dependence (vs cannabis use but not dependent)	1.96 (1.04 – 3.70)	0.037*
Has not used cannabis (vs cannabis use but not dependent)	0.40 (0.21 – 0.75)	0.005**
Methamphetamine dependence (vs methamphetamine use but not dependent)	3.26 (1.49 – 7.12)	0.003**
Has not used methamphetamine (vs methamphetamine use but not dependent)	0.83 (0.39 – 1.74)	0.615
Has used multiple illicit drug types	0.41 (0.19 – 0.92)	0.031*
Attitudes justifying violence	1.45 (0.75 – 2.81)	0.274
Attitudes minimising violence	2.41 (1.18 – 4.91)	0.016*

**statistically significant at $p<0.01$, *statistically significant at $p<0.05$

Note: CI=confidence intervals. Logistic regression: $\chi^2(12)=58.66$, $p<0.001$; Cragg–Uhler (Nagelkerke) $R^2=0.210$; Area Under the Curve=0.73

Source: AIC DUMA collection [computer file]

Finally, recent use of methamphetamine (defined as use in the last 30 days) was examined to assess whether the difference in self-reported domestic violence between detainees who were dependent on methamphetamine and those who were not could be explained by differences in use patterns. Importantly, the frequency of recent methamphetamine use was significantly higher among dependent users: 89 percent of dependent users had consumed methamphetamine in the last 30 days, compared with 66 percent of non-dependent users ($\chi^2(2)=13.37$, $p<0.01$). Further, the median number of days on which they had used methamphetamine was also significantly higher among detainees who reported being dependent on methamphetamine and had used it recently (12 days vs 3 days; $z=-3.97$, $p<0.01$). Although this is limited to the most recent 30 days, it suggests detainees who report being dependent on methamphetamine consume the drug more frequently than detainees who use methamphetamine but are not dependent.

Discussion

This study examined the relationship between methamphetamine dependence and self-reported domestic violence offending among a sample of male police detainees interviewed as part of the Australian Institute of Criminology's DUMA program. Better understanding the harms associated with methamphetamine is important given the high prevalence of methamphetamine use and dependence among criminal justice populations. The most recent data from the DUMA program show that, in 2018, more than half (57%) of all detainees had used methamphetamine in the past 12 months. Nearly half of all detainees who had used methamphetamine in the previous 12 months felt they needed or were dependent on methamphetamine—equivalent to more than one-quarter (27%) of all police detainees interviewed. The frequency of recent use has also increased.

Overall, rates of self-reported domestic violence among drug dependent detainees were very high, with close to two-thirds of methamphetamine dependent detainees reporting that they had been abusive towards a current or former partner in the previous 12 months. The likelihood of recent domestic violence was significantly higher for methamphetamine dependent detainees than for detainees who had used but were not dependent on methamphetamine, even after other factors were taken into account. Similar results were observed for cannabis dependence, although detainees who had used cannabis but were not dependent were also more likely to report recent violence towards an intimate partner.

These findings do not establish a causal relationship between drug dependence and domestic violence. They do, however, suggest that drug dependence is an important risk factor for domestic violence. The mechanisms through which dependence is linked to increased risk of violence are likely to be different for methamphetamine and cannabis.

The link between methamphetamine use and domestic violence offending (Dowling & Morgan 2018), and violence more broadly (McKetin et al. 2014), is well established. As this and other studies have shown, drug dependent methamphetamine users are likely to use methamphetamine more frequently and in larger quantities, which likely exacerbates the impact on social cognitive functioning (Homer et al. 2008; Tyner & Fremouw 2008). More frequent methamphetamine users have been found to be substantially more likely engage in violent behaviour (McKetin et al. 2014).

In contrast, research presents mixed evidence of the impact of cannabis use and dependence on violence towards an intimate partner (Choenni, Hammink & van de Mheen 2017), with some studies suggesting an association (Feingold, Kerr & Capaldi 2008; Reingle et al. 2012) and others no relationship (Crane et al. 2014; Feingold & Capaldi 2014). There are several possible explanations. Cannabis use (and intoxication) decreases the likelihood of aggression (Boles & Miotto 2003); however, cannabis users—particularly frequent users—who have difficulty controlling violent behaviour may use cannabis as a means of self-medicating (National Academies of Sciences, Engineering, and Medicine (NASEM) 2017). Further, cannabis withdrawal has been found to be associated with increased aggression among individuals with a history of aggression (Smith et al. 2012). More frequent use of cannabis has been associated with psychosis (NASEM 2017), which may be a risk factor for violence, although the link is not straightforward (Fazel et al. 2009). Finally, the relationship between cannabis dependence and domestic violence may be due to polydrug use and drug dependence, including use of or dependence on stimulants or alcohol, which are more directly associated with an increased risk of violence (Cafferky et al. 2018; Feingold, Kerr & Capaldi 2008).

It is also possible that the increased risk of domestic violence among both methamphetamine and cannabis dependent detainees is a consequence of the same underlying risk factors for both substance misuse and violence. There are clear parallels between the risk factors for substance misuse identified by Stone et al. (2012) and those for domestic violence identified by Capaldi et al. (2012), including problems in early childhood, family conflict, financial deprivation and community norms.

While the cause of the relationship may be unclear, the results still have important implications for responses to criminal justice populations. Research into the co-occurrence of domestic violence victimisation and substance use problems has frequently recommended better integrated responses (Mason & O'Rinn 2014), and the same is also true of responses to perpetrators (Crane & Easton 2017). Given the high prevalence of domestic violence among substance dependent individuals in contact with the criminal justice system, and the relationships between drug use, violence severity and risk of reoffending (Miller et al. 2016), it is recommended that individuals in treatment for substance dependence be screened for recent histories of domestic violence, and vice versa (Choenni, Hammink & van de Mheen 2017). There is evidence that substance abuse treatment may reduce the likelihood of domestic violence (Crane & Easton 2017; Stuart, O'Farrell & Temple 2009), but significant barriers have been identified, including access to treatment for clients with a history of violence, high attrition rates, program resources and the complex medical and psychological needs of clients (Timko et al. 2012). There is growing support for interventions that can target the underlying risk factors for both substance misuse and partner violence at the same time (Kraanen et al. 2013; Stover, Meadows & Kaufman 2009). Crane and Easton (2017) argue for more nuanced approaches to treatment that better recognise the individual needs of perpetrators—meaning that the response to individuals with co-occurring substance dependence and domestic violence perpetration should be different to the response to other domestic violence offenders.

Finally, the finding that attitudes minimising violence were significantly associated with an increased likelihood of domestic violence perpetration is also important. These attitudes may have preceded the violence, or they might reflect an attempt by the detainee to rationalise their behaviour post-violence. In any case, these results highlight the importance of challenging attitudes that minimise the severity of non-physical violence. These attitudes may indicate a lack of readiness to change and present a barrier to seeking assistance or participating in perpetrator programs (Scott & Wolfe 2003). They might also be a risk factor for further physical or non-physical domestic violence (Harris, Hilton & Rice 2011).

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URLs correct as at October 2019

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Appendix

Table A1: Domestic violence items

Have you done any of these things in the past 12 months...?

1. Physically hitting or kicking a partner (P)
2. Preventing a partner from accessing money (C)
3. Threatening to damage or destroy a partner's property (T)
4. Ignoring or isolating a partner when at home on a regular basis (PE)
5. Not letting a partner socialise with family or friends (C)
6. Insulting, calling names or humiliating a partner on a regular basis (PE)
7. Threatening physical violence while having a verbal argument (T)
8. Pushing or shoving a partner (P)
9. Throwing things, smashing things or breaking things during an argument (T)
10. Threatening to harm animals, children or other family members (T)
11. Keeping tabs on partner's daily activities (C)

P=physical violence; C=controlling behaviours; T= threats of violence and/or property damage; PE= psychological/emotional abuse

Source: AIC DUMA addendum quarter 4, 2012 [computer file]

Table A2: Domestic violence supportive attitudes items

Is it ever OK for someone to be violent towards their partner in the following situations...?

1. They did so to defend or protect themselves (C)
2. They were trying to protect children in the home (C)
3. They were affected by drugs and/or alcohol (E)
4. Afterwards they genuinely regretted what they did (E)
5. They were so angry that they temporarily lost control (E)
6. Their partner insulted them in front of another person (J)
7. Their partner cheated on them (J)
8. Their partner tried to end their relationship (J)
9. Their partner argued or refused to obey them (J)
10. Their partner did something purposely to make them angry (J)
11. It was just a one off incident that was not likely to happen again (M)
12. No one was physically hurt during the incident (M)
13. They threatened violence but didn't actually do it (M)
14. Their partner was affected by drugs and/or alcohol (S)

C=condone defending oneself and others; E=excusing violence; J=justifying violence; M=minimising violence; S=shifting responsibility to the victim

Source: AIC DUMA addendum quarter 4, 2012 [computer file]

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Youth justice

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18. Care-experienced children and the criminal justice system

Andrew McGrath, Alison Gerard and Emma Colvin

In Australia, between 2016 and 2017, a total of 168,352 children aged 0–18 received child protection services (30.8 per 1,000 children), and 47,915 children were in out-of-home care (OOHC) on 30 June 2017 (8.7 per 1,000 children). OOHC is the provision of temporary, medium- or long-term care by the state. There are a number of reasons for placement in OOHC, but most relate to situations where the child is thought to be at risk of harm or has suffered actual harm (Australian Institute of Health and Welfare (AIHW) 2018). The largest number of children in OOHC was 17,879 (10.3 per 1,000 children) in New South Wales (NSW), while the Northern Territory had the highest rate of OOHC, at 16.8 per 1,000 children. Most of the children in OOHC (93%) were in remunerated home-based care, with 47 percent residing with relatives or kinship carers, 38 percent in foster care, seven percent in third-party parental care and one percent in other home-based care (AIHW 2018). Five percent were in specialised residential care facilities, designed for children with the most complex needs (AIHW 2018).

One key feature of the Australian OOHC system is the over-representation of Indigenous children. Inconsistent and partial applications of the Aboriginal and Torres Strait Islander Child Placement Principle persist, alongside narrow constructions of the principle as relevant only to preferences for placement, instead of an emphasis on maintaining connections to family, country, culture and community (Tilbury 2013). The reasons underlying this pattern of over-representation are complex and relate to multiple factors, including the legacies of historical practices of forced removal that led to the Stolen Generations, intergenerational trauma and cultural assumptions around child rearing, and a lack of culturally engaged services (HREOC 1997; Purdie, Dudgeon & Walker 2010; Raman et al. 2017). This pattern of over-representation is not confined to the OOHC system. Indigenous Australians also make up a disproportionate number of people who come into contact with the criminal justice system and are subsequently incarcerated (ABS 2018; Cunneen & Porter 2017; Weatherburn 2014).

It has been suggested that children in OOHC are more likely to come into contact with the criminal justice system (McFarlane 2010, 2017a; Prison Reform Trust 2016). In the current study, we investigate the link between the experience of care and involvement with the criminal justice system. We do so using a multi-method approach that includes observations of Children's Court hearings, reviews of court files, and qualitative interviews with Children's Court magistrates and other criminal justice professionals who interact with care-experienced children.

OOHC and the criminal justice system

In Australia, research has shown that, while the overwhelming majority of those in OOHC do not commit crime, placement in OOHC is associated with increased contact with the criminal justice system (Malvaso & Delfabbro 2015; Ringland, Weatherburn & Poynton 2015). A disproportionate number of juveniles in detention have previously come into contact with the child protection system, and children in OOHC are also more likely to be under Juvenile Justice supervision (AIHW 2017). In a study of 17,638 young people involved with the criminal justice system in New South Wales, Ringland, Weatherburn and Poynton (2015) found approximately 10 percent of their sample (9.1% of males and 12.5% of females) had had previous OOHC placements. We note the lack of data disaggregated by gender and Indigenous status.

Research from the United Kingdom (UK) has observed similar findings. The Laming report found children in care to be significantly over-represented in the criminal justice system and in custody (Prison Reform Trust 2016). The Howard League for Penal Reform (2018) found children in care were more likely to have come to the attention of authorities compared with the general population; this finding was particularly marked for children in residential care. Carnie and Broderick (2015) found approximately a quarter of their prisoner respondents had been in OOHC and 16 percent had been in care at age 16. In the United States, research has shown children with a history of care are approximately twice as likely to come into contact with the criminal justice system between the ages of 14 and 16 compared with children of this age who are not in care, with placement instability being a particularly significant criminogenic factor (Ryan & Testa 2005). Further, the Midwest Evaluation of the Adult Functioning of Former Foster Youth found 28 percent of their sample had been arrested and 20 percent had spent at least one night in custody (Courtney & Dworsky 2006). In summary, although estimates of the degree of over-representation vary according to jurisdiction, methodology and sample, prior research demonstrates care-experienced children comprise a sizable proportion of those coming into contact with the criminal justice system.

Explanations for the link between care and crime

Staines (2016) has identified two competing explanations for the link between care and crime: the risk factor approach and the adverse environment approach. In the first of these, the correlation between care experience and crime is a result of pre-existing risk factors. The most commonly cited of these factors is a history of trauma, and indeed there is considerable evidence linking trauma and contact with the criminal justice system (Anda et al. 2006; Dixon, Howie & Starling 2005). In the second explanation, the care environment itself is seen as criminogenic. In our previous research, participants perceived a number of factors to be implicated in the criminalisation of children in care, including behavioural management techniques that resulted in children being charged for offences rather than their behaviour being dealt with at home, and the limited support provided for residential care staff (Gerard et al. 2019). In the second approach, the importance of the traumatic histories of care-experienced children is acknowledged but it is argued there are factors associated with the care environment itself that contribute to criminalisation over and above pre-existing risk factors.

Stanley (2017) explored the criminalising trajectory from care to custody by conducting a comprehensive review of 105 case files and interviews with participants. She concluded care-experienced children are more likely to come into contact with the criminal justice system for five reasons. The first is the history of abuse and neglect experienced by many of these young people. The other reasons were: placement instability, which in turn disrupts education, social relationships and health; the criminalisation of children's behaviour while in care; the limited support given to adult care leavers; and the differential treatment of these children by the criminal justice system in matters of bail and sentencing (Stanley 2017).

Research aims and questions

This study investigated the continuum between care and crime with a multi-method approach. Using court observations, file reviews and qualitative interviews, we sought to answer the question: what factors underlie the criminalisation of care-experienced children? In particular, we were interested in understanding how criminal justice authorities treat these children in relation to matters such as bail and sentencing and whether we could identify how and why care-experienced children come into contact with the criminal justice system. In what follows, we use the term 'care-experienced children' to incorporate children currently in OOHC and those with previous experience of OOHC.

Method

Ethical approval for this study was obtained from the Charles Sturt University Human Research Ethics Committee, protocol H17141.

Court observations

We obtained approval from the Chief Judge of the Children's Court of New South Wales to observe hearings. We also obtained approval from the presiding magistrate each day we attended court. Our observations were conducted in three Sydney outer metropolitan courts. At least two researchers attended each day of the hearings and took notes. Previous court observation studies guided our approach, and we aimed to obtain information about court procedures and how these impacted on care-experienced children (Booth 2012; Tait 2001). We thought that, by being present in court, we could explore some of the more subtle aspects of decision-making processes that are not evident in court data or written sentencing decisions. Among other things, we focused on the physical appearance and location of the child, the support available in court for the child, and the interplay between judicial officer, prosecution, defence and the child.

In total, we observed 150 hours of court hearings, relating to 134 separate matters. Researcher notes were later compiled into a single document. Based on this document, we developed a series of vignettes, which we will report throughout the *Results* section, where appropriate, to corroborate other findings. Some quantitative information was also derived and entered into a database for further analysis.

File reviews

After obtaining the appropriate approvals, we accessed a number of court files in the registry offices. Subsequently, the information was coded and entered into a database. In total, we reviewed 107 files, relating to 92 individuals. The information we obtained relating to charges and sentences was based on the most recent court appearance on file. We coded for criminal history, whether the young person had been in custody (either at the current appearance or previously), mental health conditions, homelessness, abuse or neglect, educational problems, court support (both family and other, such as case worker) and whether the current appearance related to an apprehended violence order (AVO). Our coding was based on reading the entire file; where we had unambiguous evidence for the variables we were interested in, we coded this as present.

Qualitative interviews

We conducted a series of semi-structured interviews with key stakeholders that built on the work we had undertaken in our pilot study (Gerard et al. 2019). We interviewed 10 magistrates sitting in the Children's Court and three lawyers. We also conducted three focus groups with Juvenile Justice case workers ($n=9$ and 2) and lawyers ($n=3$). As in our pilot study, we commenced by asking about the participants' general experience in the criminal justice system before shifting the focus to a discussion of care-experienced children. We were particularly interested in how magistrates took this factor into account when setting bail conditions and sentencing, but we also asked about their more general perceptions of the OOHC system and the children who come into contact with it. The interview data were transcribed, and all team members read and coded the resulting data thematically using a scheme developed collaboratively. A case study was also conducted in the UK, where 11 key informants were interviewed. The aim was to interview as many individuals from different backgrounds as possible to gain a cohesive overview of current research and policy in relation to OOHC. More detailed information relating to our qualitative method and analyses is found in Gerard et al. (2019).

Results

Court observations

Table 1 shows descriptive statistics from the court observations. Approximately 60 percent of the matters we observed were at one major outer metropolitan court in Sydney; 13 percent were at a second court and 28 percent were at a third. There was evidence of Indigenous status in 16.4 percent ($n=22$) of the cases. Of these, nine (41%) were female and 12 (59%) were male. Nearly a quarter of the children (23.9%) coming before court were in custody at the time, with a number of these appearing by video link. More than half of the matters related to bail determinations or extensions, 17.2 percent were sentence matters and 30 percent were for AVOs. Just under 30 percent of the children were accompanied by family members, and 12 percent were accompanied by a carer or some other non-family support person. There were significant gender differences in this regard, with males more likely to be supported by family members (38.6% compared to 19.5%, $p=0.033$) and females more likely to have some other form of support (22% compared to 8.4%, $p=0.035$). Analysing this in more detail, we found that family support was often perceived as advantageous to the child. It was raised by defence lawyers as a mitigating factor on several occasions and was referred to by magistrates in a number of sentencing matters. For instance, in one sentencing matter the magistrate commented:

...the seriousness of the offence means a control order. However, there is a good prospect of rehabilitation, family support, [the defendant] works with his father, I will suspend the control order and give good behaviour bonds.

In another, the magistrate told the defendant, 'You have good prospects, a caring mother, father in court' and subsequently imposed a good behaviour bond with no conviction. In a final example, the magistrate said, 'I am confident we won't see you back here for any offences, you are with family, you have support.' Indeed, family support is a well-recognised protective factor for delinquent behaviour (Malvaso & Delfabbro 2015), so for care-experienced children, who are unlikely to have such support, this is an additional disadvantaging factor that can lead to criminalisation.

Given the low number of cases where care experience was mentioned in court ($n=6$, 4.5%), we were unable to make any comparisons based on this variable; however, we speculated non-family support might be a proxy for OOHC status and note in this regard that females were more likely to receive this kind of support. The low number of cases where OOHC status was mentioned in court was a finding of some interest to us, given both the prevalence rates reported elsewhere in the literature (eg Ringland, Weatherburn & Poynton 2015) and the prevalence rate of 23.9 percent we observed in our file reviews. We discuss this finding further in our concluding section.

Mental health also emerged as an important theme. In six (4.5%) of the cases we observed, a finding was handed down under section 32 of the *Mental Health (Forensic Provisions) Act 1990*, which allows magistrates to dismiss the charges if a mental health disorder is identified as contributing to the offence. In three cases, all relating to care-experienced children, we observed the defendant being so obviously unwell they were removed from court; in one case the defendant was sent to hospital. In some cases, the defence indicated that they would make an application under section 32; however, due to the child being held in custody pursuant to section 28 of the *Bail Act 2013*, they were unable to obtain a suitable medical assessment and therefore could not make the submission. This situation was referred to as a 'catch-32' by one interview respondent (L9).

Table 1: Descriptive statistics from court observations

	All ^a	Male ^b	Female
Court			
Court 1	58.9	69.9	30.1
Court 2	12.9	50	50
Court 3	28.2	68.6	31.4
Gender	61.9		
Indigenous status	16.4	14.5	22
Court support (family) ^c	29.9	38.6	19.5
Court support (carer) ^d	11.9	8.4	22
OOHC	4.5	3.6	7.3
Custody at appearance	23.9	19.3	29.3
Sentencing matter	17.2	19.3	17.1
Bail determination/extension	52.2	51.8	56.1
AVO	29.9	30.1	24.4
S28 application	8.2	7.2	9.8
S32 hearing	4.5	3.6	7.3
Fail to appear	9.7	7.2	12.2

a: $n=134$, 7.5% ($n=10$) gender unknown

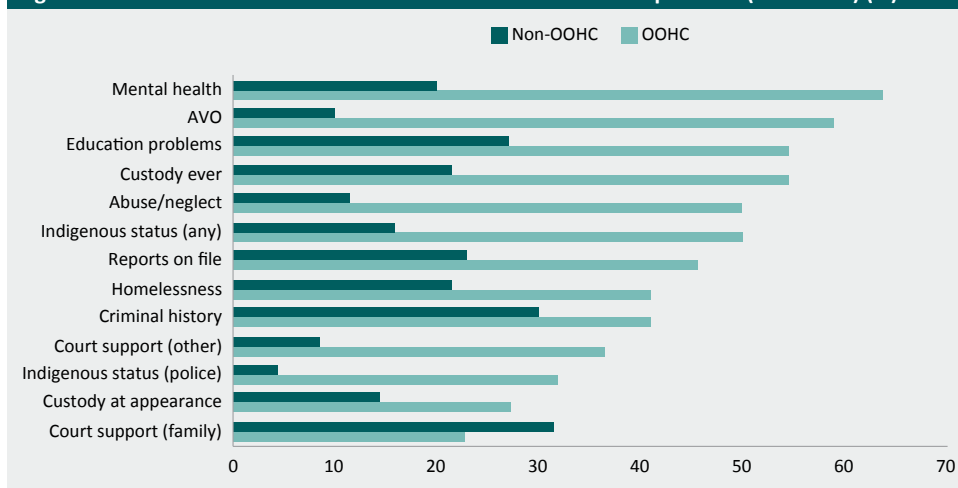
b: $n=124$, 10 cases where gender is unknown removed from analyses

c: Males had significantly more family support than females, $p=0.033$

d: Females had significantly more 'other' support than males, $p=0.035$

File reviews

We reviewed a total of 107 files, relating to 92 individuals (65, 70% males). The average age was 15.9 ($SD=1.51$). We coded Aboriginal status according to whether it had been identified by police in the first instance or whether there was any evidence for this in the file, such as the young person being represented by the Aboriginal Legal Service. Police identified 10 (10.9%) of the young people as Aboriginal. For a further 12 (13%), we found other evidence of Aboriginal status, meaning that, overall, 22 (24%) of the files related to Aboriginal young people. We also found evidence in 22 files of care experience. Based on these figures, we were able to compare care-experienced children with non-care-experienced children; Figure 1 reveals a number of important differences between the two groups. There was no difference in age or gender distribution between the groups; however, care-experienced children were more likely: to be Aboriginal ($p=0.001$), to have previous charges (as opposed to cautions, $p=0.057$), to have experienced custody ($p=0.003$), to have reports on file ($p=0.040$), to have evidence of a mental health condition ($p<0.001$), to be homeless ($p=0.070$), to have suffered abuse or neglect ($p<0.001$) and to have educational problems ($p=0.018$). In addition, as might be expected, they were more likely to be accompanied in court by a carer ($p=0.002$). Finally, just under 60 percent of the care sample appeared in court in relation to an AVO, compared with 10 percent of the non-care children ($p=0.001$). We will return to this finding in more detail, as we believe that imposition of an AVO in residential care facilities is an important determinant of criminalisation.

Figure 1: Differences between children with and without care experience (court files) (%)

Note: OOHC=out-of-home care

Qualitative interviews

The first broad theme we identified in our interviews was understanding care-experienced children. The magistrates we interviewed acknowledged the challenges facing care-experienced children (Magistrate Focus Group, M6). Like our pilot study respondents (Gerard et al. 2019), the magistrates recognised that police are commonly called as a strategy to manage the problematic behaviour of children in care:

Often there's an argument with another resident and the police are called, or there's an argument with a youth worker and the police are called, or there's a problem with behaviour from the child and the police are called. The problem I find is too many times the police are called as a first resort rather than a last resort—the question I have is what strategies do these places have to deal with these problem kids...without resorting to the criminal justice system. (Magistrate Focus Group)

Other magistrates perceived the care environment itself as a source of offending behaviour:

We have a lot of contact. Far too much...mainly it's offences against other residents. So young people against young people which escalates because of their vulnerable status themselves and offences against carers. (M1, M2)

These observations are consistent with the evidence we identified in our court and file reviews: that offending arises out of care experience. We also found care-experienced children were more likely to be in court in relation to AVO matters, and often the victim was a care worker or co-resident. This was referred to specifically by another magistrate respondent: 'Depending on the crime, if it's a situation where the child has assaulted or contravened [AVOs], usually accommodation is a major issue' (M4). Again, consistent with our pilot study findings, the magistrates recognised the deficiencies in agency and staff responses to care children. As one commented:

I have massive concerns as to how well they're looking after children but those concerns arise out of evidence and experience in the care jurisdiction rather than the criminal jurisdiction. (Magistrate Focus Group)

Others, however, found agencies and their staff to be supportive of the young people in their care, noting agency workers often volunteered to take children back into care after the court hearing had been concluded (M1, M6). The devolution of OOHC services from government to the non-government sector has not resulted in better quality services for children in OOHC (NSW Legislative Council 2017).

A second theme to emerge from our interviews was the welfare of care-experienced children and how factors such as mental health and lack of education contribute to criminalisation. Consistent with previous research findings (Ryan & Testa 2005), the magistrate respondents recognised the damaging impact of placement instability: 'If the child is anything over about five or six, the disruption, especially if it involves schooling, is exponential' (M4). Impaired educational opportunities were seen as an important factor in criminalisation:

The problem that I see [for] all kids in care and in the criminal jurisdiction is education—so many of them don't go to school—they don't have any education at all, so it's a double whammy...so many of them get kicked out of school and expelled. (Magistrate Focus Group)

Mental health and other welfare issues also contributed to their criminalisation:

Because there is no alternative, because they become criminal matters then and I think these are really mental health issues or social issues, or they're matters not for magistrates to be involved in, in my view. The first call should be to health providers. (M5)

The final theme we identified was in relation to bail and sentencing for care-experienced children. The difficulties of setting appropriate bail conditions for children from care occupied the thoughts of many of our magistrate respondents. As one commented:

Well, if somebody's only offence is related to being in care, you don't want to set them up to fail if you don't release them, so ultimately I get to the stage of minimalist conditions because otherwise you rarely see them. Like, no more crimes. Or just make sure you stay at home...and don't abscond. (M6)

A lack of suitable accommodation was said to compound these problems:

So often—fortunately not too often, but often enough, you find yourself in a situation where literally the child has nowhere to go and there's no places now available like the old bail houses that there used to be. (M1)

Given these difficulties, respondents perceived bail breaches by young people in care to be dealt with sympathetically:

We have a high tolerance with breaches similarly to breaching bail as to breaching court orders. We will quite often bring either a male or female back before the court to remind them, rather than taking action which would, for instance, mean arresting them and sentencing them in custody. (M4)

In our court observations, the vexed relationship between OOHC status and accommodation was also a clear theme. One case we observed, involving an 11-year-old male defendant, illustrated this vividly. He had been removed from the care of his mother during the previous year, and the first offence for which he appeared in court was a public transport offence (feet on seat) that occurred while he was apparently in the process of returning home. He was subsequently charged with assault and property damage for an incident in which he threw a chair at his carer. On the third occasion we observed him, he had been in custody for more than two weeks and was appearing via video link. No suitable accommodation had been found for him, so he remained in custody. In the second case, a 13-year-old Aboriginal girl became distressed during the court hearing and was subsequently removed. There was evidence of mental health conditions and a history of trauma. Again, difficulties in finding an appropriate care facility resulted in time spent in custody. At the conclusion of the hearing, the young girl was bailed to live in a care home in a regional area, as her severe agoraphobia, which had developed as a result of her childhood trauma, would likely confine her to the facility.

In our pilot study we also identified a limited awareness among OOHC service providers of the needs of Indigenous children in care, and the need for increased levels of cultural competence in all sectors coming into contact with the care system. The magistrate respondents in the present study demonstrated an awareness of these needs, noting how legislation:

...very properly places requirements on the court in respect of ensuring that any child in care has culturally appropriate connections...I do think that that is something that the legislation and the court does very well. (M6)

Our Aboriginal Juvenile Justice participants also reported concerns about the cultural safety of the residential care environment. One respondent told us:

So, just on the Aboriginal side of things, culturally out-of-home care kids aren't getting their needs met. And...there's not enough resources or Aboriginal workers to work with these kids. Aboriginal kids are different, don't you worry about that. (JJ9)

Indigenous children in residential care and under Juvenile Justice supervision were seen as being in need of cultural support:

Just recently me and my colleague, another Aboriginal fellow, we went over...for Sorry Day activities last year. And we were just in there giving talks on what Sorry Day was about. And me talking about tribes and totems and kids were just all over me, just thirsty for knowledge. And that was just going in there for a day. So I don't think there's enough of that, I don't think JJ do enough of that either. But you're restricted with what you do with resources and everything else. If we don't do it, I doubt FACS would do it. (JJ9)

Discussion and conclusion

In the current study we investigated the links between care experience and contact with the criminal justice system through observations of Children's Court hearings, reviews of court files, and interviews with Children's Court magistrates. Our findings demonstrated that the criminalisation of children with care experience results from a complex interaction between trauma, mental health conditions, the care environment, and difficulties in locating suitable accommodation. Addressing the criminalisation of these children can be achieved only if this complexity is recognised. Policy and therapeutic interventions must be developed with an understanding of this context. It is clear care-experienced children face a number of disadvantages compared with their non-care peers, including poorer educational outcomes, lack of family support, unstable living arrangements, and the often chaotic and violent care environment. Although the results of our study are in many ways consistent with previous research (eg McFarlane 2017b), there are a few findings we would like to focus on in more detail.

In our court observations, we saw how offences arising out of the care environment led to time spent in custody and how difficult it was in some cases for appropriate accommodation to be found. Here, custody was a result of welfare disadvantages rather than criminal offending. Many of the matters we observed related to AVO orders where the victim was either a co-resident or a care worker. This was corroborated by our file reviews, which identified that care-experienced children were more likely to be appearing in court in relation to an AVO matter. Some of this disparity may be explained by the individual characteristics of these children but, at the same time, it was clear that a number of the AVOs arose directly from incidents that occurred in the care environment. We do not wish to downplay the risks to care workers; indeed, there was evidence in some cases of workers being the victims of considerable acts of violence. Nevertheless, all the evidence obtained in this study suggests the response to problematic behaviour in care is a contributing factor to criminalisation, with children's behaviour being managed by way of police and/or an AVO. Our study was conducted both before and after the commencement of the 2016 NSW Government's Joint Protocol to Reduce the Contact of Young People in Residential Care with the Criminal Justice System, which aimed to reduce unnecessary police contact with those in residential care; however, we observed little evidence of its implementation in our research. We also note the protocol discusses police responsibilities in relation to AVOs in residential care and aspects to take into account when imposing these. Given the importance of AVOs in escalating criminalisation, further attention should be paid to these provisions.

In our previous research, many in the sector spoke to us about the importance of trauma-informed care (Gerard et al. 2019), a central tenet of which is a focus on the individual rather than their behaviour (Harris & Falloot 2001). Although many of our respondents recognised the traumatic histories of care-experienced children, it appears the management of their problematic behaviour was prioritised over a holistic understanding of their individual circumstances. Following the introduction of the NSW Therapeutic Care Framework in 2017, trauma-informed care in the OOHC system has been accepted as best practice to avoid the criminalisation of care children. Further attention should be given to the ongoing implementation and evaluation of this framework. Our UK case study also provides a number of mechanisms that could be adopted to help achieve this in Australia.

Access to accommodation emerged as a key theme of this study and another driver of criminalisation. The magistrates spoke of the difficulties in having to remand children where no viable accommodation options were available, and we observed a number of cases where care children charged with relatively minor offences remained in custody while appropriate accommodation was sought. In this regard, the file review data showed care-experienced children were more likely to have custodial experience and to have been homeless (although the latter relationship only approached significance). We recognise the challenges facing authorities in relation to identifying safe and secure accommodation for children with complex needs who may have in the past been involved in violent incidents with care workers and co-residents; nevertheless, remand custody and homelessness can only lead to further criminalisation. Addressing this problem should be a priority for policymakers and justice authorities who seek to reduce the over-representation of care-experienced children in the criminal justice system.

Although many of our respondents recognised the significance of care experience in shaping the behaviour that leads children to appear in court, we suspected that, in a number of the matters we observed, the fact that the child had previously been in contact with the care system was not raised. Care status was raised in fewer than five percent of the matters we observed in court, in contrast to the information found in the files, in which we found evidence of care status in just under a quarter of the cases. A number of our magistrate respondents reported they wished to be informed of this during hearings, but it appeared this information was often not provided. This might be a result of the lack of time available to lawyers to talk to their clients and/or the fast pace which matters are dealt with in some courts. Regardless, we believe this is a critical piece of information that should be raised in court.

Our study was not without shortcomings. The major limitation was the lack of care-experienced voices. We addressed this to a certain extent by extending our research method to include court observations; however, we acknowledge the voices of care children would strengthen our research. We also observed hearings in only a limited number of courts, and our sample of files was relatively small. Because of these limitations, some caution should be exercised in generalising from our findings, although the results reported here are consistent with other work in this area (McFarlane 2017b). Given the limited sample size and measures used, our statistical analyses were restricted to descriptive comparisons, and we could not answer questions such as whether care-experienced children were more likely to have been in custody in the past because of their care experience or because they were more serious offenders. Nevertheless, we identified a number of factors implicated in the continuum between care and crime that should be of interest to criminal justice authorities seeking to arrest this trend.

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19. The costs of Indigenous and non-Indigenous offender trajectories

Dr Troy Allard, Dr Molly McCarthy and Professor Anna Stewart

Recently it has been suggested that Indigenous over-representation in detention and prison should be included as a key national priority in the Closing the Gap strategy (COAG 2018). This strategy recognises the need for a long-term approach to reduce Indigenous disadvantage and aims to deliver improved health, education and employment outcomes for Indigenous Australians.

Achieving improved criminal justice system outcomes for Indigenous Australians has been a goal of many justice agreements and plans that have operated in every Australian jurisdiction over past decades, as well as more recently through the Commonwealth's National Indigenous Law and Justice Framework (Allard 2010; Allard et al. 2010). Despite well-intentioned efforts and investments to reduce Indigenous over-representation in the criminal justice system, the gap has widened and Indigenous Australians are now more over-represented in detention and prison populations than they have been at any point in history.

Indigenous children are over-represented at each stage of the criminal justice system, being between three and 16 times more likely to be charged by police and seven to 10 times more likely to appear in children's court than non-Indigenous children (Allard 2011). Indigenous children are 17 times more likely than non-Indigenous children to be under community supervision and 23 times more likely to be in detention, while Indigenous adults are 12 times more likely to be incarcerated than non-Indigenous adults (Australian Institute of Health and Welfare 2019; Productivity Commission 2018). Reducing this over-representation makes sense on social justice and economic grounds. Responding to offending and applying sanctions both constitute a significant economic burden for governments, with estimates indicating that court appearances, community-based supervision, detention and incarceration incur considerable costs (see Productivity Commission 2018). Reducing Indigenous over-representation in these populations has the potential to reduce a significant proportion of the existing criminal justice system costs.

Understanding the offending patterns of individuals across their life course and the costs to the criminal justice system provides useful evidence about the long-term economic consequences of current criminal justice system responses (Allard & Manning 2011; Allard et al. 2014). Such evidence may be used, for example:

- to develop and evaluate activities which aim to prevent offending;
- to change system responses and pathways for young offenders; or
- to develop cost-effective interventions to reduce offending.

The findings of this analysis can inform the development of innovative approaches including justice reinvestment and payment by outcome, and the investment in early intervention, community, situational and criminal justice programs to reduce offending (see Allard 2010, 2011; Allen 2011; Clear 2011; Little et al. 2011; Little & Allard 2011; Ogilvie & Allard 2011).

No previous research has explored the costs of offender trajectories separately for Indigenous and non-Indigenous Australians. Findings from research conducted on whole cohorts indicate that members of ethnic minority groups including Indigenous Australians populate chronic offender groups at high rates (Allard, Chrzanowski & Stewart 2015, 2013; Allard et al. 2014; Broidy et al. 2015; Ferrante 2013; Livingston et al. 2008; Maldonado-Molina et al. 2009; Piquero & Buka 2002). It is argued that many members of ethnic minority groups have early onset and high rates of offending because of their unique structural contexts (eg racism and poverty) and related exposure to key risk factors (eg poor socialisation, development and parenting, attenuated family bonds, exposure to disadvantaged schools and fewer employment opportunities) that both foster early onset and preclude desistence (Haynie, Weiss & Piquero 2008; Moffitt 1993).

Studies that have explored the costs of offender trajectories have adopted different samples, follow-up time frames and costing frameworks. Most of these studies have been conducted overseas and have assessed the cost of offence types based on a wide range of tangible and intangible costs (eg criminal justice system, victim loss and suffering, lost productivity for victims and offenders, and fear of crime). While many of these costs are not directly transferable to the Australian context, findings indicate that chronic offenders incur a disproportionate share of costs, with each chronic offender costing between US\$95,241 and US\$17m over the life course (Allard et al. 2015, 2014, 2013; Cohen, Piquero & Jennings 2010a, 2010b; Day & Koegl 2019; Piquero et al. 2013). Only one study has explored offender trajectories and costs based on race/ethnicity (Cohen, Piquero & Jennings 2010a). That study found that African American chronic offenders had the highest total costs, with this group incurring an average cost of US\$1.6m over the life course.

Given its potential usefulness for policymakers and advocates, the study presented in this article explored differences in life-course offender trajectories to age 31 years for Indigenous and non-Indigenous Queenslanders, and estimated the net present value of these offending trajectories, modelling the patterns of system contacts as future costs. The study analysed a population-based birth cohort that includes offending and criminal justice system contacts for all persons registered as being born in Queensland during 1983 and 1984. A narrow costing framework focused on direct criminal justice system costs was used. Estimates were based on key cost drivers, to facilitate use of the findings in cost-benefit analyses and business cases. Three research questions were addressed:

- How many distinct offender trajectories can be identified for Indigenous and non-Indigenous Queenslanders?
- What is the nature and extent of criminal justice system contacts for individuals in the Indigenous and non-Indigenous trajectory groups?
- What are the long-term criminal justice system costs associated with Indigenous and non-Indigenous offending trajectories, and how are these costs distributed across the criminal justice system agencies?

Method

Birth cohort

There were 83,371 individuals registered as being born in Queensland during 1983 and 1984. Just over one-half ($n=42,946$, 52%) of the cohort were male and a small proportion ($n=2,295$, 3%) were classified using the multi-stage median algorithm as having Indigenous cultural heritage. This cohort was established using the data linkage and cleaning processes described elsewhere (Allard, McCarthy & Stewart 2020). Given the data used to define the cohort, the linkage process is likely to have underestimated the overall Indigenous population size, and therefore may have somewhat inflated the frequency of criminal justice system contacts in the identified Indigenous cohort (see *Limitations of the study* for further information).

One-quarter ($n=22,686$, 27%) of the birth cohort were found guilty of at least one offence between the ages of 10 and 31 years. An offence involved a guilty plea or a finding for behaviours outlined in the Australian and New Zealand Standard Offence Classification (ABS 2011). Category 14 (traffic offences) were excluded because most are dealt with by infringement notice but individuals may elect to have a court hearing. Those who were classified as Indigenous in the cohort were more likely to have offended and to offend more frequently than those who were classified as non-Indigenous (Indigenous: $n=1,844$, 80% offended, $M=26.84$ offences, $SD=44.04$; non-Indigenous: $n=20,843$, 26% offended, $M=2.12$ offences, $SD=11.87$). The average age of onset of offending was 18.22 years, with individuals in the Indigenous cohort on average two years younger than those in the non-Indigenous cohort when they first offended ($M=16.14$ years, $SD=4.59$; $M=18.4$ years, $SD=4.64$). The individuals in this cohort were linked to 233,970 recorded offences and 90,087 criminal justice system events. These events included formal police cautions ($n=12,564$), youth justice conferences ($n=179$), finalised youth court appearances ($n=8,829$) and finalised adult court appearances ($n=68,515$).

Research phases

The research questions were addressed in three phases.

Phase 1: Identifying the number of offender trajectories

To address the first research question, latent class growth modelling was used to model trajectories of the biennial offence counts from age 10–11 to 30–31 years, using Mplus software. Biennial counts constrained time observations and thus assisted with model convergence. Separate trajectory analyses were performed for the identified Indigenous and non-Indigenous cohorts. A zero-inflated Poisson distribution was used for the latent class growth modelling as offence counts were over-dispersed with an excess of zero offence count observations. Additionally, several individuals had biennial offence counts that exceeded 25 offences. To assist the trajectory modelling to converge, these outliers were re-scaled to have an upper limit of 25 offences in any two-year period. Model solutions with between two and five groups were examined, and were based on a range of goodness of fit indicators, including entropy values and average class probabilities for most likely class membership. A three-class model for both Indigenous and non-Indigenous Queenslanders was selected as the best-fitting model (Allard et al. 2020).

Phase 2: Exploring the nature and extent of criminal justice system contacts

The second research question targeted the nature and extent of criminal justice system contacts for individuals in the identified Indigenous and non-Indigenous trajectory groups. This question was addressed by focusing on the adolescent onset and early onset (chronic) trajectory groups. Members of the low rate and non-offenders group accounted for very few criminal justice system events (cautions, youth and adult court) and sanctions (community-based supervision, youth detention and adult incarceration). The proportions of individuals identified as Indigenous and non-Indigenous in the cohort who experienced the main criminal justice system events and sanctions were estimated. Additionally, the average number of criminal justice system events and average number of days that individuals in the groups were supervised on the sanctions were determined.

Phase 3: Exploring the long-term criminal justice system costs of offending trajectories for Indigenous and non-Indigenous offenders

The third research question was about the long-term criminal justice system costs for those who were identified as Indigenous and non-Indigenous in the different trajectory groups, and how these costs would be distributed across the criminal justice departments. The analytical strategy to address this question involved two stages. First, a primarily top-down costing framework was established which involved disaggregating agency expenditure (non-central operational costs directed to service delivery, excluding capital works) based on activities and outputs. A broad range of data was used to estimate resource allocation across activities and outputs, including financial and human resources data, administrative crime records, police activity and investigation management data, courts event data and interviews with frontline staff. The unit cost estimates for key transactions also took into account critical cost drivers, including whether an individual was diverted by police to a caution or conference, the most serious offence type charged, whether court events included trials and the type of supervised sanction. The detailed methodology used to establish the unit cost estimates is provided elsewhere (Allard et al. 2020) and the unit cost estimates in 2016–17 dollars are provided in Figure 1.

Figure 1: Police, court and sanction unit cost estimates applied to the Indigenous and non-Indigenous offender trajectories (2016–17 dollars)

Police unit cost estimates (per offending event)	Court unit cost estimates (per principal offence finalised)	Sanction/supervision costs (per event/day)
Caution \$3,453 Conference \$3,832 Court Homicide and related offences \$138,291 Acts intended to cause injury \$5,761 Sexual assault and related offences \$20,163 Dangerous or negligent acts \$4,479 Abduction, harassment and other \$9,493 Robbery, extortion and related \$13,288 Unlawful entry with intent/burglary, break and enter \$4,299 Theft and related offences \$2,570 Fraud, deception and related \$3,007 Illicit drug offences \$3,879 Prohibited and regulated weapons and explosives offences \$4,476 Property damage and environmental pollution \$2,876 Public order offences \$2,400 Offences against justice procedures \$3,302 Miscellaneous offences \$1,633	Homicide and related offences \$19,674 Acts intended to cause injury \$1,165 Sexual assault and related offences \$6,543 Dangerous or negligent acts \$508 Abduction, harassment and other \$2,076 Robbery, extortion and related \$3,021 Unlawful entry with intent/burglary, break and enter \$1,080 Theft and related offences \$821 Fraud, deception and related \$1,159 Illicit drug offences \$776 Prohibited and regulated weapons and explosives offences \$761 Property damage and environmental pollution \$981 Public order offences \$556 Offences against justice procedures \$603 Miscellaneous offences \$704	Conference (per event) \$11,340 Sanctions (per day) Youth Community service order & graffiti removal order \$22 Probation order & supervised release order \$124 Conditional release order & conditional bail program \$362 Youth detention \$1,498 Adult Community service order \$5 Probation order & parole order \$9 Intensive corrections order \$22 Adult incarceration \$182

Police costs were assessed for offending events cautioned or conferenced, and for the most serious offence charged for offending events proceeding to court. An offending event was defined as all offences related to an individual within an identified police occurrence or incident. The estimates took into account the relative expenditure based on the length of time that general duties, Child Protection and Investigation Unit/Criminal Investigation Branch (CPIU/CIB) and forensics officers spent on offences that were cautioned or conferenced or proceeded to court. Specialist area expenditure was apportioned based on the full-time equivalent staff in each of the areas (eg homicide, fraud and cybercrime) and then applied to the most relevant offending event types. Police prosecutions time and cost was not able to be estimated due to an absence of relevant data across offending event types.

Court costs for the Queensland Department of Justice and Attorney-General were assessed based on the principal offence finalised. Estimates took into account the proportion of offences that led to trials and trial length, as well as differences in the number of other court events (eg application, callover, committal or hearing). Unfortunately, additional court costs such as the provision of legal aid and police prosecution services could not be included. The cost of the main types of youth and adult community-based orders were assessed based on a cost per day, taking into account the different lengths of time that officers devote to different order types, based on interviews with frontline staff. Youth justice conferences were assessed as a cost per conference held, whereas youth detention and adult incarceration were assessed as a cost per day.

The second stage involved modelling the cost estimates to determine costs based on individuals identified in the cohort as Indigenous or non-Indigenous and their trajectory group in order to estimate the long-term direct criminal justice system costs for each group. To ensure that the costs in the study would be relevant and useful for contemporary policymaking, the patterns of contacts with the criminal justice system that occurred for the 1983–1984 birth cohort were projected as future criminal justice system contacts for a cohort that turned 10 in 2016–17, using an approach similar to incidence-based costing (Larg & Moss 2011). The base year for the cost modelling is 2016–17, and hence all costs are reported in 2016–17 dollars, with costs projected into the future discounted at seven percent annually, consistent with guidelines from the Australian Government Department of Finance (Australian Government 2007).

Results

Number of offender trajectories

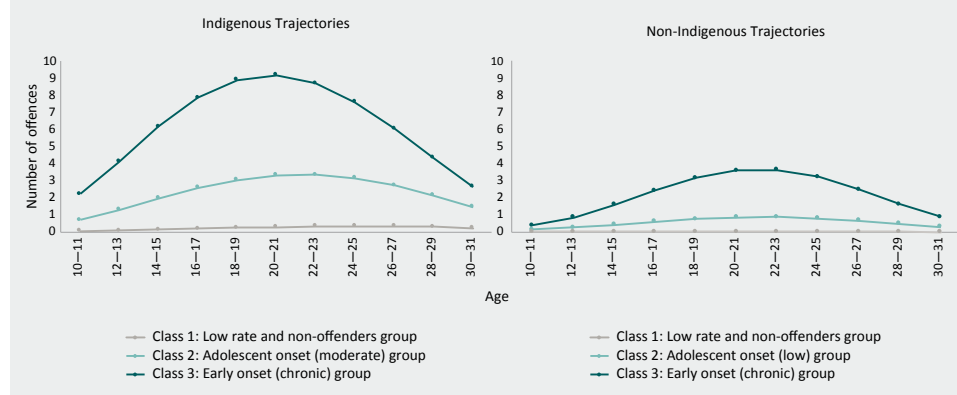
The first research question required examination of the number of trajectory groups for those classified as Indigenous and non-Indigenous in the birth cohort. Figure 2 presents the three trajectory groups identified by latent class growth modelling.

For those in the cohort classified as Indigenous, individuals in class 1 had either low levels of offending or no offending between the ages of 10 and 31 years. Nearly one-half (47%) of the identified Indigenous cohort were in class 1, and accounted for four percent of offending by the identified Indigenous cohort ($M=2.26$ offences, $SD=2.68$). Given the low rate of offending over time, class 1 was labelled the ‘low rate and non-offenders’ group.

Class 2 displayed adolescent onset offending ($M=15.05$ years old, $SD=3.32$) which continued into adulthood and peaked between the ages of 20 and 25 years. Just over one-third (38%) of the identified Indigenous cohort were in class 2 and accounted for one-third of offences (36%) committed by the identified Indigenous cohort ($M=25.16$ offences, $SD=16.13$). Class 2 was labelled the ‘adolescent onset (moderate)’ group.

Class 3 had early onset ($M=13.2$ years, $SD=2.84$) and high levels of offending ($M=107.77$ offences, $SD=62.4$), with offending peaking when individuals were aged 20–21 years old. Class 3 included 15 percent of the identified Indigenous cohort and accounted for 60 percent of offences by the identified Indigenous cohort. Class 3 was labelled the ‘early onset (chronic)’ group.

Figure 2: Estimated marginal means for three-class Indigenous and non-Indigenous trajectory models



The trajectory model for those classified as non-Indigenous showed similar patterns, though the volume of offending and the age at which offending began differed notably from the Indigenous cohort (Figure 2). Additionally, the proportions of individuals classified in each group differed markedly. Over four-fifths (84%) of the identified non-Indigenous cohort were in class 1, the 'low rate and non-offenders' group, and had either low levels of offending or no offending when aged 10 to 31 years ($M=0.13$ offences, $SD=0.38$).

Class 2 had adolescent onset of offending ($M=18.26$ years old, $SD=4.5$) which continued into adulthood and peaked at ages 20 to 23. Just over one-tenth (14%) of the identified non-Indigenous cohort who were born in 1983–1984 were in class 2, averaging 6.08 offences when aged 10 to 31 ($SD=5.43$). Class 2 was therefore labelled the 'adolescent onset (low)' group. Class 3, the 'early onset (chronic)' group, had early onset ($M=16.22$ years old, $SD=4.18$) and high levels of offending ($M=46.01$ offences when aged 10 to 31, $SD=56.47$), with offending peaking when aged 20 to 23 years old. Class 3 included three percent of the identified non-Indigenous cohort and 56 percent of their offending.

Nature and extent of criminal justice system contacts

The second research question required exploration of the nature and extent of criminal justice system contacts for individuals in the Indigenous and non-Indigenous trajectory groups. Table 1 presents the main criminal justice system events and sanctions that were used to respond to offending by members of the adolescent onset and early onset (chronic) offending groups based on identified Indigenous status. High proportions of individuals in these groups had at least one caution or youth court appearance, and nearly all individuals in these groups also experienced an adult court appearance. Relatively high proportions of individuals in the early onset (chronic) groups and Indigenous people in the adolescent onset group experienced supervision through a community-based order, youth detention or adult incarceration. It is apparent from the average number of youth and adult court finalisations that individuals in these groups had considerable repeat contact with the system.

Individuals in the chronic offender groups also spent considerable lengths of time under community-based supervision and in detention or incarceration. Those classified as Indigenous and in the chronic offender group spent an average of 4.8 years on community-based orders and 4.9 years incarcerated, compared with those classified as non-Indigenous in the chronic offenders group spending 2.3 years on community-based orders and 1.3 years incarcerated, between the ages of 10 and 31. Table 1 displays the mean number of events presented for caution and finalised court appearances, and the mean number of days presented for youth and adult community-based orders (excluding community service), youth detention and adult incarceration.

Table 1: Main criminal justice system events and sanctions experienced by members of the adolescent onset and early onset (chronic) offender groups based on whether classified as Indigenous or non-Indigenous

Nature of contact with system	Adolescent onset group				Early onset (chronic) group			
	Indigenous (n=878)		Non-Indigenous (n=11,029)		Indigenous (n=347)		Non-Indigenous (n=2,093)	
	% experience	M	% experience	M	% experience	M	% experience	M
Caution	64.6	1.12	38.9	0.54	79.8	1.80	57.4	1.00
Youth court	51.9	1.54	11.1	0.18	86.5	6.69	39.3	1.45
Adult court	98.5	9.41	87.7	2.55	98.8	21.02	90.0	8.67
Youth community-based order	27.5	136.20	2.7	10.8	78.1	686.20	24.4	136.7
Adult community-based order	56.5	417.10	16.5	98.8	83.0	1,079.40	64.8	708.30
Youth detention	7.2	3.53	0.2	0.12	54.5	127.95	9.3	8.22
Adult incarceration	34.4	282.90	3.8	21.88	82.1	1,659.35	37.3	440.00

Long-term criminal justice system costs for Indigenous and non-Indigenous offending trajectory groups

The third research question required the application of unit cost estimates and economic modelling to estimate the long-term costs of criminal justice system responses to individuals in the trajectory groups. As well as giving a clearer indication of the accumulation of direct criminal justice system costs over the long term, this type of analysis can also indicate the magnitude of potential cost savings that could result from preventing initiation of offending by individuals in the different trajectory groups and allows an exploration of how these savings could be distributed across criminal justice system agencies. However, while estimated costs can indicate potential cost savings, it is not assumed that all existing criminal justice system costs are avoidable. Table 2 presents the net present value (in 2016–17 dollars) of the costs associated with offending by individuals in the trajectory groups, with the offending trajectories projected into the future and discounted at seven percent per annum.

Over one-half of the identified Indigenous cohort (53%; 1.5% of the total birth cohort) were in the adolescent onset (moderate) or early onset (chronic) groups. When modelled as future costs based on the nature and volume of contacts, individuals in these two groups accounted for 40 percent of total criminal justice expenditure. Based on this analysis, an Indigenous young person aged 10 years in 2016–17 will cost an average of \$57,806 in the adolescent onset group or \$380,097 in the early onset group in direct criminal justice system costs by the time they turn 31 years old.

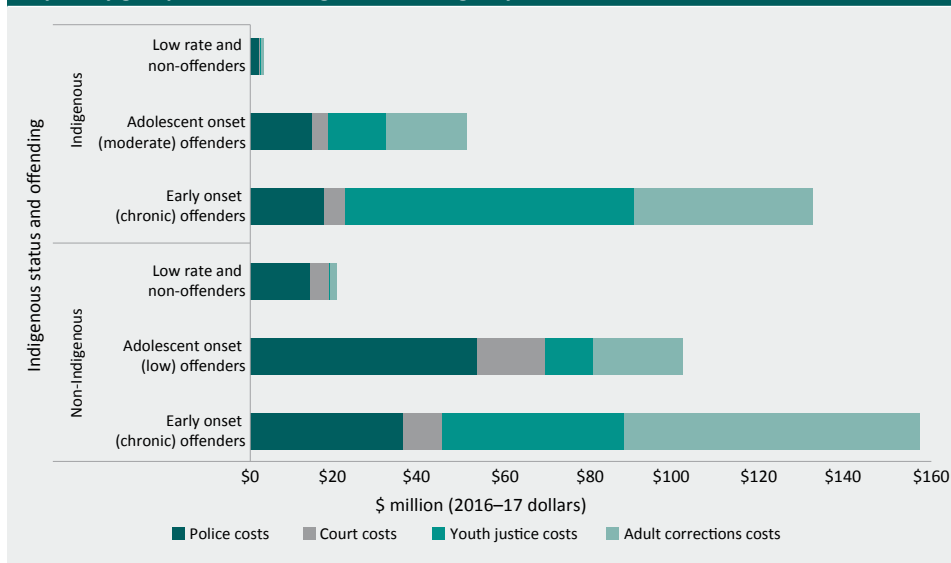
In contrast, individuals in the non-Indigenous cohort who were in the adolescent onset (low) and early onset (chronic) groups accounted for 16 percent of the total cohort and 55 percent of the projected criminal justice system costs. A non-Indigenous young person in the early onset (chronic) group aged 10 in 2016–17 will cost an average of \$74,798 by the time they turn 31 years old.

Table 2: Net present value of long-term direct criminal justice system costs for individuals in each trajectory group, from age 10 to 31 years

Trajectory group		Individuals					Cost	
		N	% of Indigenous or non-Indigenous cohort	% of total cohort	Average Individual cost (\$)	Total group cost (\$) (2016–17 dollars)	% of Indigenous or non-Indigenous cost	% of total cost
Indigenous	Low rate and non-offenders	1,070	46.6	1.3	2,980	3,188,345	1.7	0.7
	Adolescent onset (moderate)	878	38.3	1.1	57,806	50,753,239	27.3	11.1
	Early onset (chronic)	347	15.1	0.4	380,097	131,893,751	71.0	28.8
	Total	2,295	100	2.8	80,974	185,835,335	100	40.6
Non-Indigenous	Low rate and non-offenders	67,954	83.8	81.5	267	18,112,599	6.7	4.0
	Adolescent onset (low)	11,029	13.6	13.2	8,783	96,868,753	35.7	21.2
	Early onset (chronic)	2,093	2.6	2.5	74,798	156,552,496	57.7	34.2
	Total	81,076	100	97.2	3,349	271,533,847	100	59.4

Figure 3 presents the net present value of criminal justice system costs for each trajectory group up to age 31 years when modelled into the future, based on the agency that bears the costs. This modelling indicates which agencies would benefit from reduced costs if offending by individuals in the different trajectory groups was prevented or reduced. Most cost savings would result from preventing early onset (chronic) offending, with significant savings for youth justice (\$110,940,032; 81% of the total estimated youth justice costs for the cohort) and adult corrections (\$111,415,641; 73% of the total estimated adult corrections costs for the cohort). Preventing early onset (chronic) offenders from initiating would also result in considerable savings for police (\$54,894,764; 39% of the total estimated costs for the cohort), although a significant proportion of the police budget is also directed towards adolescent onset (low) offenders because of the larger volume of these types of offenders.

Figure 3: Net present value (2016–17 dollars) of total criminal justice system costs for each trajectory group based on the government agency that bears the costs



Discussion

Overview of the findings

There are four important findings from this study. First, those in the identified Indigenous cohort were more likely than those in the identified non-Indigenous cohort to be found guilty of offending. They also had a higher frequency of offending and experienced more serious sanctions. Over one-half (53%) of those in the identified Indigenous cohort were in the two main offender groups (adolescent onset and early onset) and on average were found guilty of 49 offences before age 31 years. Only 16 percent of those in the identified non-Indigenous cohort were in the two offending groups, and they were found guilty of an average of 13 offences. For the cohort as a whole (including the low rate and non-offenders group), each individual classified as Indigenous was found guilty of an average of 27 offences, while each individual classified as non-Indigenous was found guilty of an average of two offences.

Second, a large proportion of those in the identified Indigenous (47%) and non-Indigenous (83%) cohorts were classified in the low rate and non-offenders groups, and there is a considerable difference in the average cost of individuals in these groups based on Indigenous status. Each Indigenous person in the low rate or non-offenders group cost \$2,980, while each non-Indigenous low rate or non-offender cost \$267. This difference can be explained in part by the larger proportion of the selected Indigenous cohort who had at least one recorded offence: 58 percent of Indigenous and 11 percent of non-Indigenous individuals in the low rate or non-offender groups had one or more offence.

Third, there is considerable churn in the system, with many individuals having repeated contact. On average, each individual who was classified as Indigenous and who was in the early onset (chronic) group had seven finalised youth court appearances. In the adult court, those identified as Indigenous who were in the adolescent onset and early onset (chronic) groups had an average of nine and 21 finalised adult court appearances respectively. Individuals in the chronic offender groups also spent considerable time being supervised on orders. In the chronic offender groups, those identified as Indigenous spent an average of 10 years and those identified as non-Indigenous spent an average of four years on community-based orders and in detention and/or prison between the ages of 10 and 31.

The notable differences in cost between chronic offenders in the Indigenous cohort and chronic offenders in the non-Indigenous cohort (\$380,097 compared to \$74,798 respectively) appear to derive in large part from the greater frequency and length of youth justice sanctions for the Indigenous chronic offending cohort—in particular, probation orders and detention. The greater frequency of these sanctions may be to some extent a function of the greater churn or frequency of contact with the criminal justice system for the Indigenous chronic offenders cohort over their young adult life, compared to the non-Indigenous chronic offenders cohort. It may also in part derive from a somewhat greater rate of violent offending among the Indigenous chronic offenders cohort, which may affect their eligibility for diversionary options or particular sanction types, as well as potentially affecting the length of their sanctions.

Finally, considerable economic benefits would result from reducing offending by those identified as Indigenous in the adolescent onset group and by those identified as Indigenous and non-Indigenous in the early onset (chronic) groups. When the direct criminal justice system costs of individuals in these groups are projected into the future, individuals within these groups account for nearly half of police costs (49%), just over half of court costs (57%) and the vast majority of youth justice (91%) and adult corrections (85%) expenditure for the entire cohort. On average, each Indigenous early onset (chronic) offender will cost \$380,097 over their young adulthood, while each non-Indigenous early onset (chronic) offender will cost \$74,798 over this period. Each adolescent onset Indigenous offender will cost an average of \$57,806 over young adulthood. When the adolescent onset and early onset groups are combined for those in the identified Indigenous cohort, which account for over one-half of that cohort, the average cost of each individual is \$208,026. In total, individuals in these three groups represent four percent of the cohort and account for 74 percent of the total cohort costs, with costs primarily related to youth justice and adult corrections expenditure.

Implications for policy and practice

The project has two main implications for policy and practice. First, the unit cost estimates and the estimates for the trajectory groups that were developed can both serve as key inputs or enablers for cost–benefit analyses or business cases that estimate the costs of changes to current responses in the criminal justice system, or that assess the benefits of prevention programs, interventions targeted at preventing reoffending, or innovative approaches such as justice reinvestment or payment by outcome. These estimates may be particularly useful for programs and approaches that aim to reduce Indigenous over-representation in the criminal justice system, given the relatively high levels of costs associated with the Indigenous offending cohorts.

Existing unit cost estimates for criminal justice system practices (see Productivity Commission 2018) do not include police costs, and the validity of other estimates may be questionable because they do not take into account critical cost drivers. The unit cost estimates produced in this project considered whether an individual was diverted, offence type, whether there was a trial and trial length, and the length of time directed towards supervised orders. Moreover, the cost estimates of the different trajectory groups have been projected as future costs, with 2016–17 used as the base year and costs discounted at seven percent annually. The estimates therefore represent the net present value of future costs and can be used to assess the likely benefits that may result from alternative criminal justice system pathways, programs and approaches.

Second, there is a need to reduce Indigenous over-representation in the criminal justice system by ensuring equitable processes at each stage of the criminal justice system and by better identifying the causes of over-representation. This would enable more focused efforts not only to prevent the onset of offending but also to encourage desistance from offending by Indigenous young people (Allard 2011). Indigenous people accounted for three percent of the cohort but 40 percent of total criminal justice system costs. The large proportion of those classified as Indigenous people who were in the adolescent onset and early onset (chronic) groups and the small proportion of individuals classified as non-Indigenous in the early onset (chronic) group would be ideal candidates for prevention activities.

Innovative approaches including justice reinvestment and payment by outcome may prove to be effective investment frameworks. There are also a range of early-intervention, community-based, situational and criminal justice activities that could be considered which would reduce the risk factors for offending and enhance protective factors to prevent offending or reduce its reoccurrence (Allard 2011, 2010; Allen 2011; Clear 2011; KPMG 2018; Little & Allard 2011; Little et al. 2011; Ogilvie & Allard 2011). Indeed, the findings provide some support for innovative initiatives that are currently being provided in Queensland by the Department of Child Safety, Youth and Women which may reduce offending such as the Our Way strategy, The First 1000 Days, and Aboriginal and Torres Strait Islander Family Wellbeing Services.

Limitations of the study

There are two main limitations of the study. First, the study was based on analyses of administrative data which only include reported offences, and there is always the potential for such data to include as being born in Queensland during 1983 and 1984, with Indigenous status determined using the multi-stage median algorithm (see Allard et al. 2019). This algorithm resulted in the classification of 2,295 people as having Indigenous cultural heritage. While this approach may reduce the likelihood of incorrectly identifying someone who had contact with the systems as Indigenous (eg due to administrative error), it may potentially fail to count Indigenous people who did not identify as Indigenous, or who had no contact with the systems and who were either not registered at birth or not registered as Indigenous at birth.

Other sources suggest that the number of Indigenous people in the birth cohort may be an underestimate, with the ABS *Experimental estimates* suggesting that there may have been 4,970 Indigenous people (ABS 2009). Other less conservative approaches to classifying individuals based on Indigenous status such as the 'ever' identifier resulted in the identification of 4,821 Indigenous people. When the 'ever' identifier was used, 24 percent (19,183÷78,550) of individuals classified as non-Indigenous had an offending history ($M=1.83$ offences, $SD=11.13$) and 73 percent (3,504÷4,821) of individuals classified as Indigenous had an offending history ($M=18$ offences, $SD=11.13$). Therefore, the approach used to classify an individual's Indigenous status was conservative and likely under-identified and/or enumerated the denominator population. The results in this report should be considered indicative rather than exact representations of Indigenous offending rates, and, when applying these results to the broader Indigenous population, the under-identification of Indigenous people in the cohort and the resulting potential inflation of the frequency of offending in this cohort should be considered.

Second, all cost estimation exercises involve sources of uncertainty and error. The cost of the trajectories projected into the future assumes that patterns of contacts and existing cost estimates will be relatively stable over time. The unit cost estimates relied on administrative data relating to activities and resources which were not designed for estimating costs. This means that estimates will be impacted by the quality of the data systems and any assumptions that had to be made. Further, while the estimates took into account critical cost drivers, other cost drivers that could not be assessed may also impact such as location (eg remote area versus major city) and whether the offender pleaded guilty. Finally, the unit estimates were based on the direct criminal justice system costs and therefore do not include other considerable costs that result from offending—particularly those for victims, offenders, families of victims and offenders, taxpayers and government, and wider society (see Allard & Manning 2011).

Directions for future research

Future research should consider using different costing methods to explore the costs of offender trajectories and could try to prospectively identify members of trajectory groups based on risk and protective factors (see Allard et al. 2015). Research should consider using a bottom-up costing framework to produce more fine-grained cost estimates that reflect the short-run opportunity costs associated with reduced offending, as well as the wider economic and social costs that would facilitate cost–benefit analyses. Additional research that assesses the costs of crime and intangible costs will help researchers to develop more valid and reliable cost estimates. The need for additional research which predicts future offending and differentiates offender trajectory groups based on risk factors is also essential to improve the efficient targeting of costly crime prevention programs.

Conclusion

Understanding the offending patterns over the life course of the different trajectory groups promotes long-term thinking about appropriate responses to offending and encourages the use of potentially more resource-intensive early-intervention and criminal justice system programs to prevent offending and reoffending. Multiple intervention points (including intergenerational interventions such as working with the children of prisoners) can be identified to prevent the initiation of offending or—once an individual has engaged in offending—to prevent reoffending and encourage desistence of offending. These intervention points are not restricted to early intervention and can occur at all points in the life cycle; however, there are clearly social and economic benefits to reducing the harms of offending early in life, not only for victims and offenders but also for broader society. In addition, many of these interventions may not directly target offending but may instead target risk factors outside the criminal justice system that are known to be associated with offending, such as mental health, child protection, and school engagement programs. While many of these programs and interventions may appear costly, they may be cost-effective when the magnitude of long-term systems costs are considered.

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20. What are the characteristics of effective youth offender programs?

Kamarah Pooley

There is a growing body of literature concerned with ‘what works’ in reducing youth reoffending. This literature aims to identify approaches, programs, interventions or elements thereof that are empirically associated with reductions in criminal behaviour. While there is a considerable amount of information on various approaches and programs, there is very little support for practitioners on how to design, deliver and implement programs that are likely to be effective in reducing reoffending. When evidence-based interventions are replicated at a local level, they may be altered to best fit local conditions. Although these changes may be necessary, they can reduce the effectiveness of the intervention.

While there is a strong consensus within the literature that no one intervention will work for all young offenders in all contexts, there are common features of effective programs that are consistently associated with reductions in reoffending (Prior & Mason 2010). Identifying and describing these program components would make a valuable contribution to our understanding of how to make sure new and existing youth offender programs align with evidence-based principles of program design, delivery and implementation.

This is particularly important when developing new responses to youth offending, including for emerging crime problems and trends. In the absence of a strong evidence base to guide policymakers and practitioners in the selection of initiatives to reduce reoffending, having a baseline against which the development of new programs can be benchmarked is important.

This systematic review consolidates the findings from recent research to identify the common components of effective tertiary youth offender programs relating to design, delivery and implementation. The review addresses the research questions:

- What are the design, delivery and implementation characteristics of tertiary prevention programs that have been associated with reductions in reoffending among young people?
- How can these program components be applied to enhance the effectiveness of tertiary programs targeted at young offenders?

In this chapter, ‘program’ will be used to refer to youth offender programs implemented to reduce reoffending among young people who have come into contact with the juvenile or criminal justice system, and ‘components’ to the design, delivery and implementation characteristics of these programs.

Methodology

Search strategy

This study emerged from a larger systematic review of literature concerned with ‘what works’ in reducing youth offending. Studies were included if they contained information about tertiary prevention programs implemented in Australia or other developed countries for young people aged 10–25 years who had come into contact with the juvenile or criminal justice systems. Included studies reported at least one quantitative or qualitative outcome measure related to reoffending such as prevalence, frequency, seriousness, versatility, or time to first reoffence. Contemporary literature was targeted by including studies published in English between January 2009 and October 2019 in scholarly journals or evaluation reports. Literature was excluded if it was a review or evaluation of a primary or secondary prevention program, was not published in English or was published prior to 2009. Theoretical articles, audio/visual files and newspaper and magazine articles were also excluded.

Multiple searches of the Australian Institute of Criminology’s JV Barry Library catalogue, EBSCO Discovery, ProQuest, PubMed, Campbell Collaboration and Cochrane Library databases were conducted with the following search terms:

- Target: (youth OR juvenile OR young person OR child* OR adolescen*) AND
- Intervention: (what works OR program OR evaluation OR prevent* OR reduc* OR respond*) AND
- Outcome: (offend* OR crim* OR reoffend* OR recidivism).

Database searches were conducted independently by the researcher and an Australian Institute of Criminology librarian to ensure search term reliability and replicability.

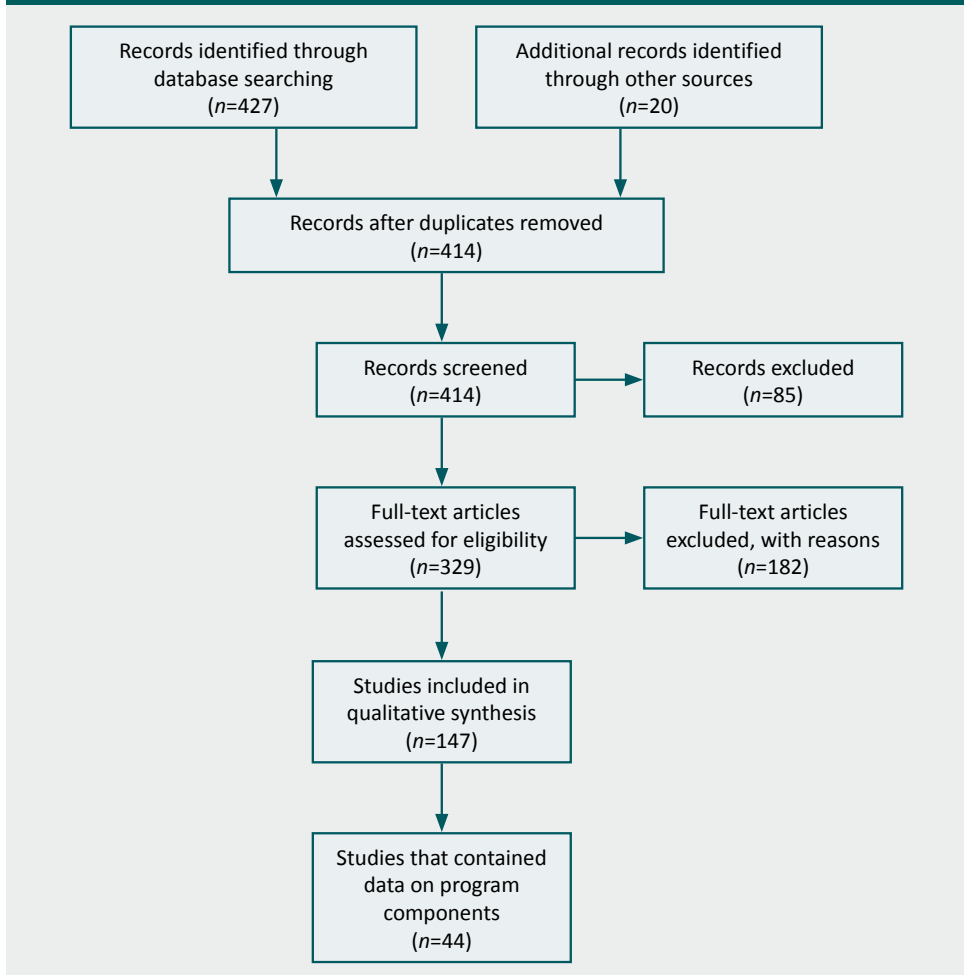
Study selection and analysis

As shown in Figure 1, the search terms identified a total of 447 books, journal articles and government reports. Thirty-three duplicates were removed. After preliminary screening that involved a review of titles and abstracts/executive summaries, 85 studies were excluded because they contained reviews or evaluations of primary or secondary prevention programs, or were audio/visual files or newspaper/magazine articles. The remaining 329 studies were sourced for further analysis. Secondary screening was conducted by reviewing the studies in full. During this process, an additional 182 studies were excluded because they were explanatory or theoretical, they did not report findings for 10–25 year olds, or because they were evaluations of a specific program and had been superseded by an evaluation of the same program, often by the same authors, with greater methodological rigour. The remaining 147 studies were included in the review.

The studies underwent thematic analysis. This involved a review of the studies to identify information about program implementation, design and delivery; coding of the data to identify common elements; the establishment of general themes; and the refinement of these themes through further analysis (Miller 2018).

Of the 147 studies included in the systematic review, 44 (30%) contained information about program implementation, design and delivery. The final sample of 44 studies formed the basis of the analysis for this study.

Figure 1: Search results



Identifying program components associated with reductions in youth reoffending

Three primary measures were used to identify program components related to the effectiveness of tertiary youth offender interventions:

- statistical analyses identified direct and/or mediated associations between program component(s) and youth reoffending outcomes (bivariate and multivariate models);
- practitioners involved in the delivery and implementation of the tertiary program identified a relationship between program component(s) and youth reoffending outcomes (and provided evidence of this); and
- thematic or content analyses identified a strong link between perceptions or experiences of effectiveness and program components, as described by study authors.

Critically, while in many studies the effectiveness of programs was associated with the presence of particular implementation, design and delivery principles, in others the ineffectiveness of programs was associated with the absence of these program components. In this way, the focus of the study was not only on positive findings, but negative or null findings as well.

Limitations

There are limitations to this study. The aim of the systematic review was to consolidate contemporary evidence related to what works in reducing youth offending. This review emerged from the thematic analysis of that data. Search terms specific to program design or implementation are likely to produce more studies. Further, only those studies that used measures of reoffending to operationalise program effectiveness were included in the review. This was to ensure comparability and ease of data extraction; however, it limits the number and types of studies included. There may be some gaps in knowledge as a result. The findings of this review should be considered in this context.

Results

Study characteristics

As shown in Table 1, the studies included in the review related to a diverse range of tertiary programs, the most common being direct evaluations and meta-analyses of tertiary youth offender programs implemented in the United States and evaluated using quasi-experimental or experimental design and quantitative analysis. Given the diversity within the sample (see Table 1), these findings may contribute to the broader evidence base on what works for young people who offend.

All 44 studies provided evidence that one or more program components were associated with program effectiveness. When programs were found to be effective, program components were associated with reductions in reoffending. When programs were found to be ineffective, the absence of program components was associated with increases in reoffending. The primary measure of reoffending used was prevalence.

Table 1: Study characteristics

	<i>n</i>	%
Program type		
Youth offender ^a	21	48
Community supervision/programs	5	11
Transition	4	9
Mentoring	3	7
Multi-dimensional ^b	3	7
Education, employment and training	2	5
Cognitive-behavioural	1	2
Detention	1	2
Diversion	1	2
Family-based	1	2
Prison visitation	1	2
Speciality courts	1	2

Table 1: Study characteristics (cont.)			
		<i>n</i>	%
Source type			
	Direct evaluation	21	48
	Meta-analysis	10	23
	Literature review	7	16
	Systematic review	4	9
	Rapid evidence assessment	2	4
Research design			
	Quasi-experimental or experimental	17	39
	Post-test only	15	34
	Narrative review	6	14
	Pre- and post-test	2	4
	Other ^c	4	9
Data analysis methods			
	Quantitative	24	55
	Mixed methods	8	18
	Qualitative	6	14
	Narrative review	6	14
Jurisdiction			
	United States	18	41
	Multiple ^d	11	25
	Australia	9	20
	Europe	3	7
	Canada	1	2
	Singapore	1	2
	Not reported	1	2

a: Studies that evaluated/meta-analysed/systematically reviewed multiple tertiary prevention youth offender programs

b: Multi-model, multi-disciplinary, multi-agency programs that addressed multiple risk factors simultaneously

c: Analytical decision tree, cohort, Maryland Scientific Methods Scale, and weight of evidence process

d: More than one jurisdiction including a combination of Australia, Canada, Europe, New Zealand, Scandinavian countries and the United States

Note: Percentages may not total 100 due to rounding

Program components

In all 44 studies, the authors associated at least one program component with effectiveness. Nine program components that were positively related to program effectiveness were identified in the literature:

- program theory ($n=4$);
- risk of reoffending ($n=8$);
- risk, needs and responsiveness assessment ($n=17$);
- cultural sensitivity ($n=5$);
- fidelity ($n=15$);
- dosage ($n=13$);
- practitioner–client relationship ($n=7$);
- intra- and inter-agency coordination ($n=5$); and
- evaluation ($n=11$).

These design, delivery and implementation characteristics are not mutually exclusive; each can inform and contribute to the others. The components should therefore be considered collectively.

Program theory

Four studies (9%) identified a link between an evidence-based theory of change with program effectiveness. Program theory, or a theory of change, explains how program activities will achieve program outcomes (Meadowcroft, Townsend & Maxwell 2018). Programs that based their logic on existing evidence were more likely to implement activities that attained intended reductions in reoffending (Braga 2016; Klenowski, Bell & Dodson 2010; Meadowcroft, Townsend & Maxwell 2018; Welsh & Rocque 2014).

When program design and implementation are not underpinned by a strong theory of change, negative outcomes can result. In a systematic review of youth offender programs, Welsh and Rocque (2014) found that, when programs were not informed by theory, they produced harmful effects regardless of program type. Similarly, Klenowski, Bell and Dodson's (2010) systematic review of prison visitation programs found that these interventions were generally ineffective in reducing reoffending. The authors attributed this to a failure to apply program theory to program design and implementation, particularly the strong theoretical consensus that severity of punishment does not deter and fear-arousal educational approaches do not change behaviour. Finally, Braga (2016) evaluated the impact of gang outreach programs and found they increased reoffending. He argued that these outcomes emerged due to program designers' failure to account for literature that has clearly explained that group-based programming reinforces gang identity and cohesion, strengthening group processes and dynamics that support criminality (Braga 2016). To effectively prevent youth offending, an empirically supported theory of change should be ingrained within the design and implementation of a program to inform program activities and aims.

Risk of reoffending

Eight studies (18%) reported on the association between program effectiveness and risk of reoffending, all of which found that programs produced greater reductions in reoffending among high-risk young offenders compared to low-risk young offenders (Lipsey 2009; Morales, Garrido & Sánchez-Meca 2010; Strom et al. 2017). Although they only account for the minority of young offenders, those assessed as high risk are involved in the majority of contacts with the juvenile and criminal justice systems and, as such, account for a disproportionate number of offences and costs associated with youth offending and reoffending overall (Cohen & Piquero 2009). Targeting high-risk young people produced the greatest net benefit in the studies reviewed (Cohen & Piquero 2009; McGuinness, Tuohy & Rowney 2017; Skeem, Scott & Mulvey 2014).

Although these findings imply that interventions that target high-risk offenders are more effective at reducing reoffending than those that target low-risk offenders, this relationship requires deeper analysis. In particular, it is important to recognise that high-risk young offenders are less likely to reduce their offending or desist without intervention. As such, programs targeted at these cohorts are more likely to detect an effect than those focused on low-risk offenders, who are likely to stop reoffending of their own accord (Adler et al. 2016; Strom et al. 2017).

To prevent youth offending, the risk of reoffending and capacity to detect reoffending should be considered when evaluating programs.

Risk, needs and responsivity

Seventeen studies (39%) linked a risk–need–responsivity (RNR) assessment with program effectiveness. An RNR assessment matches services to a young offender’s unique circumstances based on their:

- risk of reoffending;
- physical, psychological and psychosocial needs that are associated with offending but amenable to change; and
- responsivity shaped by their strengths, abilities, motivation, personality, learning styles and demographic characteristics (Adler et al. 2016; Cramer, Esthappen et al. 2019; Murphy, McGuinness & McDermott 2010; Roy et al. 2011; Skeem, Scott & Mulvey 2014; Spiranovic et al. 2015).

Interventions that used RNR assessments to classify and allocate resources to young offenders were more likely to reduce reoffending (Adler et al. 2016; Calleja et al. 2016; Chan & Boer 2016; Cramer, Esthappen et al. 2019; Day, Zahn & Tichavsky 2015; Koehler, Losel et al. 2013; Lipsey & Howell 2012; Luong & Wormith 2011; McGuinness, Tuohy & Rowney 2017; Roy et al. 2011; Shlonsky et al. 2017; Skeem, Scott & Mulvey 2014; Spiranovic et al. 2015). RNR assessments are effective because they apply an objective and replicable approach to identifying those programs that best meet the needs of young people (Knight et al. 2017). Programs that use the RNR model can ensure that those who are most vulnerable, such as Indigenous, LGBTIQ+, mentally ill or disabled young people, have their needs addressed (Roy et al. 2011).

Despite strong consensus in the literature that interventions implemented based on an RNR assessment are effective at targeting the underlying causes of offending, and thus reducing reoffending, issues with the model have also been identified. Sampson and Themelis (2009) stated that many risk factors for offending are also indicators of victimisation, while some risk factors may promote resilience rather than offending. Further, risk assessment tools may produce false positives, incorrectly classifying an individual as at risk or belonging to a class of risk, when that risk does not exist. A false negative occurs when an assessment tool fails to identify risk, and the individual proceeds to engage in criminal behaviour (Lind 2011; Norris, Griffith & Norris 2017). Although it is important to assess risk, needs and responsivity, it is also necessary to ensure that valid and reliable assessment tools are used to measure RNR and match individuals to interventions (Norris, Griffith & Norris 2017).

To enhance the tertiary prevention of youth offending, rigorous RNR assessments should be conducted with valid and reliable assessment tools prior to allocating a young person to a program. Thereafter, the assessments should be repeated regularly to evaluate the continued suitability of programs and to adapt interventions to address the dynamic needs of young people.

Cultural sensitivity

A review of the literature suggests that cultural sensitivity is critical to program effectiveness when young people maintain strong cultural ties. This is especially true in Australia, where five of the nine (56%) Australian studies reviewed identified the importance of cultural sensitivity to programs for young Indigenous Australians. These studies found that programs designed for Indigenous Australians were more effective than mainstream programs at reducing reoffending among Indigenous young people (McGuinness, Tuohy & Rowney 2017). Culturally sensitive programs incorporated culturally appropriate activities in interventions, engaged service providers from the same cultural backgrounds to design and deliver programs, used young people's preferred languages and embedded traditions and norms within interventions (Fazal 2014; Roy et al. 2011). Fazal (2014) found that when interventions were implemented by someone with shared place, language, histories or beliefs, Indigenous young people were more likely to perceive the intervention or practitioner as credible. When culturally sensitive programs were identified as equally effective as traditional processes, they were still preferred because they also had the capacity to empower and strengthen Indigenous communities (Borowski 2010).

To reduce reoffending among young Indigenous people, programs should incorporate culturally appropriate interventions and the active participation of cultural leaders in designing, developing, implementing and evaluating programs for Indigenous Australians (Murphy, McGuinness & McDermott 2010). Further, matching young people with practitioners from similar cultural backgrounds has the potential to reduce institutional racism and systemic biases that contribute to the over-representation of Indigenous Australians in the criminal justice system (Fazal 2014). Where the majority of Australian sources identified cultural sensitivity as a pertinent consideration, Australian program design, delivery and implementation must be informed by, and sensitive to, Indigenous Australian culture.

Fidelity

Fifteen studies (34%) associated reductions in youth offending with program fidelity, or adherence to program implementation protocols. Research suggests that programs that are implemented according to protocols are more likely to achieve intended outcomes (Alder et al. 2016; James et al. 2013; Lipsey 2018; Meadowcroft, Townsend & Maxwell 2018; Shlonsky et al. 2017; Weaver & Campbell 2015). When the practitioners involved in the design, implementation and monitoring of programs had the capacity, knowledge and resources to ensure high fidelity, the programs were more likely to be effective in reducing youth reoffending (Lipsey 2018; Schwalbe et al. 2012).

Low levels of program fidelity have also been associated with harmful outcomes (Welsh & Rocque 2014). Program fidelity can affect program outcomes independent of the individual characteristics of young people and is as important as program type in reducing youth reoffending (Adler et al. 2016).

Although high fidelity is critical to effectiveness, program delivery must be flexible enough to support the engagement of young people and accommodate their different and dynamic circumstances. As discussed above, programs that can adapt to the risks, needs and responsivity of young people are more likely to be effective (Fazal 2014; Meadowcroft, Townsend & Maxwell 2018). Flexibility in program structure has been found to support engagement among young people and reduce attrition and reoffending (Cramer, Esthappen et al. 2019; Cramer, Lynch et al. 2019; Meadowcroft, Townsend & Maxwell 2018; Strnadová, O'Neill and Cumming 2017).

These findings highlight the tension between program fidelity and adaptability. Taken together, they indicate that adaptability should not allow program implementation to deviate from its protocol. Rather, program delivery should comply with specifications while being shaped by individual and contextual considerations (Prior & Mason 2010). To enhance the tertiary prevention of youth offending, programs must be implemented with high fidelity while maintaining flexibility to meet the different and dynamic needs of young people.

Dosage

Thirteen studies (30%) identified a link between program dosage and effectiveness, although there were differences in the relationships found. Dosage, also referred to as intensity, contact or length, is the number of hours per session and the number of sessions per intervention that a young person may receive. While most studies found that dosage influenced program effectiveness (Adler et al. 2016; Calleja et al. 2016; de Vries et al. 2015; Fazal 2014; James et al. 2013; Klenowski, Bell & Dodson 2010; Lipsey 2009; McGuinness, Tuohy & Rowney 2017), one identified no moderating effects (Weaver & Campbell 2015).

Among the studies that identified a positive association, results differed by offender and program type. For example, de Vries et al. (2015) found that lower dosage was more effective at reducing reoffending among low-risk offenders, with higher dosages being counterproductive even after controlling for the characteristics of the offender (age, gender, cultural background, offending behaviour) and the type of program (one-on-one, group, family, multimodal). In contrast, higher dosages are more effective than lower dosages for programs that are therapeutic in nature, such as mentoring (James et al. 2013; Miller et al. 2013). Here, young people were less likely to reoffend when they received support and therapy more frequently and for longer periods. Conversely, higher dosages were found to produce higher rates of reoffending in behavioural control programs such as bail (Bouchard & Wong 2018; McGuinness, Tuohy & Rowney 2017). Although heightened supervision theoretically deters young offenders, frequent supervision increased the likelihood that a young person would be detected engaging in offending behaviour, thus increasing detected rates of reoffending (Bouchard & Wong 2018). The type of program, and the nature of the supervision involved, appears to mediate the effectiveness of dosage.

To enhance the tertiary prevention of youth offending, the dosage of an intervention should be based on the type of program and characteristics of the young person, taking into account predetermined lengths of sentences or programs (Calleja et al. 2016; Fazal 2014; Strnadová, O'Neill & Cumming 2017). The literature highlights the need to ensure that program dosage matches the risks, needs and responsivity of individual participants, as well as the logic underpinning the program.

Practitioner–client relationships

The literature suggests that the development of positive and collaborative working relationships between practitioners and young people is critical to program effectiveness. Seven studies (16%) attributed program effectiveness in part to the quality of the practitioner–client relationship. The literature revealed that programs that built warm, open and non-judgemental relationships between the practitioners and young people were more likely to reduce reoffending (Adler et al. 2016; Prior & Mason 2010; Sampson & Themelis 2009). A collaborative working alliance between practitioner and client has been found to increase:

- the likelihood of young people responding positively to treatment;
- perceptions that the intervention is fair and reasonable; and
- program completion (Adler et al. 2016; Cramer, Esthappan et al. 2019; Prior & Mason 2010).

To enhance the effectiveness of tertiary youth offender programs, the practitioner–client relationship must be based on clarity, openness, humour and respect, where the main purpose of the interaction is to reinforce protective factors that enable a young person to desist from offending (Prior & Mason 2010; Sampson & Themelis 2009). When practitioners and young people have similar interests, experiences and backgrounds, young people perceive practitioners as credible and program outcomes are enhanced (Cramer, Esthappan et al. 2019; Hanham & Tracey 2017; Miller et al. 2013). Evidence suggests that young people want to work with practitioners who believe in them, empathise with them and recognise their strengths. Conversely, young people are dissuaded from participating in and completing programs when practitioners do not treat them with respect, place too much pressure on them or overstate their failures (Moore, McArthur & Saunders 2013).

Intra- and inter-agency coordination

Coordinated and accountable service delivery that reflects the multifaceted and complex needs of young people has been associated with program effectiveness (Adler et al. 2016; Cramer, Esthappan et al. 2019; Unnithan & Johnston 2012). Five (11%) studies associated intra- and inter-agency coordination with program effectiveness, all of which found that effective coordination contributed to reductions in reoffending. Inter- and intra-agency coordination facilitates the sharing of information to inform program referral and provides young people with access to a broader range of services (Unnithan & Johnston 2012). More broadly, interconnectedness and integration within and between services facilitates:

- better understanding of young people and the context of their offending;
- the sharing of resources, expertise and values; and
- the delivery of ‘wraparound’ responses to youth offending (Roy et al. 2011).

Service providers also benefit from inter- and intra-agency working arrangements as they provide opportunities to confer, learn, share, and collaborate to overcome challenges and obstacles within and across program delivery sites (Cramer, Esthappan et al. 2019; Cramer, Lynch et al. 2019).

To enhance the tertiary prevention of youth offending, inter- and intra-agency coordination should be achieved through regular face-to-face meetings, training sessions, conference calls, or other means of communication that facilitate information sharing (Cramer, Esthappan et al. 2019). Partnership protocols and strategic leadership may help with this coordination (Adler et al. 2016).

Evaluation

Eleven studies (25%) identified a link between evaluation mechanisms and program effectiveness, all of which found that evaluation contributed to better outcomes. Youth offending interventions cannot be implemented or replicated without ongoing evaluation that both measures effectiveness and provides information that can support program development or modification (Cramer, Lynch et al. 2019; Meadowcroft, Townsend & Maxwell 2018; Roy et al. 2011; Skeem, Scott & Mulvey 2014). Through frequent and rigorous evaluation and performance monitoring, programs can become more effective over time as they are adapted according to findings. Increasing the effectiveness of programs is an incremental and continuous process of reflection and redesign (Welsh, Rocque and Greenwood 2018). This iterative approach enables programs to be adapted to the changing needs of stakeholders or changes in the conditions within which the program operates (Cramer, Esthappen et al. 2019).

Recidivism, or the rate of reoffending, is perceived as the benchmark against which to measure the effectiveness of youth offender programs. Measures of short-term reoffending carry the greatest weight when governments decide whether a program should continue (Stout, Dalby & Schraner 2017). Although intended outcomes usually involve a reduction in risk or criminogenic need, recidivism measures in isolation cannot tell practitioners how this change was achieved, or how effective a program is at bringing about change in a young person's life that may influence their likelihood of reoffending (Cramer, Esthappen et al. 2019; Spiranovic et al. 2015; Stout, Dalby & Schraner 2017). Measuring other program outcomes in addition to recidivism—including program completion, readiness to change, psychological/behavioural change, education, employment, relationships and prosocial engagements—may provide a more sensitive, comprehensive and nuanced consideration of what assists young people along their winding path to desistance (Spiranovic et al. 2015; Stout, Dalby & Schraner 2017).

To enhance the tertiary prevention of youth offending, programs should include evaluations assessing their effectiveness using multiple measures of reoffending, while placing equal emphasis on other outcomes that contribute to long-term desistance.

Discussion

In Australia and overseas, a huge number of programs have been trialled and implemented to respond to young people who come into contact with juvenile and criminal justice systems for a range of offending behaviours. Although there is a strong evidence base supporting some of these program types (eg restorative justice conferencing), there is limited research that consolidates information about the design, delivery and implementation of these programs, and program characteristics related to effectiveness.

This study identified nine components of effective programs that are supported by evidence. These components were empirically associated with program effectiveness by methodologically diverse studies conducted in various contexts, suggesting they reveal broad, overarching principles to guide the design, delivery and implementation of youth offender programs.

The program components are inter-related. Considered collectively, the findings suggest that tertiary youth offender programs are most effective when they are implemented as intended, and are underpinned by a clearly articulated and evidence-based theory of change. This theory of change helps program designers identify how a program will reduce reoffending behaviours, and the mechanisms underlying this change. However, the way in which the program is delivered should be flexible enough to meet the individual needs and circumstances of the young people involved. This includes conducting RNR assessments, matching young people with appropriate practitioners with whom they can develop positive working relationships, tailoring activities to suit the cultural backgrounds of young people, and ensuring that young people spend enough time with practitioners to experience a benefit. In Australia, programs will need to be sensitive to the needs and circumstances of young Indigenous Australians. Here, cultural relevance must be at the forefront of program design, delivery and implementation. Finally, tertiary programs are better able to meet the individual needs of young people where there are strong and ongoing inter- and intra-agency working relationships, and where programs are adapted and refined in accordance with the findings from ongoing evaluations.

While there is no 'one size fits all' approach to preventing youth offending, programs that have a strong theoretical basis, consider the individual needs of young people, are culturally sensitive to Indigenous Australians where relevant, and reflect on practice through iterative evaluation will be best placed to address the underlying causes of offending.

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21. Youth justice in Australia: Themes from recent inquiries

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Introduction

Young people aged between 10 and 18 years who commit a crime in Australia may find themselves faced with one of a number of possible criminal justice responses. Generally, this will involve being arrested by the police, interviewed and potentially charged. Depending on the seriousness of the offence and various legal requirements (which can vary according to jurisdiction), the young person may be diverted from the traditional criminal justice process (for example, to a police caution or some form of restorative justice intervention) or put before a court (often, but not always, a specialist children's court). They might then receive some form of community sanction, or in the case of serious crimes and/or repeat offending they may be sentenced to serve a period in custody.

Since ABC's Four Corners program aired an investigation into the Don Dale Youth Detention Centre in 2016 (Four Corners 2016) there has been considerable focus on the operation of Australian state and territory youth justice systems. Images of young people on the rooftops of youth justice detention centres (see, for example, Noyes et al. 2019; *The Guardian* 22 July 2019: Independent review ordered after riot at NSW juvenile justice centre) or being strip-searched and tear-gassed during disturbances (see, for example, Pengilley 2019); and the image of a young person restrained in a spit hood (see, for example, Meldrum-Hanna & Worthington 2016; *The Guardian* 4 October 2016: Don Dale: teenager stripped naked and hooded by six guards, court hears) have brought considerable focus to the operation of Australian youth justice systems—perhaps like never before. This paper will provide an overview of some of the key themes that have arisen out of the many reviews into Australian youth justice systems in recent years.

Important context: Falling youth crime

Before highlighting some key themes arising from recent reviews, it is necessary to consider the contemporary trends in youth crime.

Youth offending has fallen across most Australian jurisdictions in the past decade. In 2008–09, 71,421 young people (or a rate of 3,187 per 100,000 population) were proceeded against by police throughout Australia (ABS 2020). In comparison, in 2018–19, 49,180 young people (or a rate of 2,045 per 100,000 population) were proceeded against by police (ABS 2020). Over a period of 10 years the rate of young people proceeded against by police declined by 36 percent.

Similarly, other jurisdictions around the world have also experienced a consistent decline in proceedings against young people over the past decade. For example:

- In Canada between 2008 and 2018, the number of young people (aged 12–17) committing offences reported by police fell by 48 percent (Moreau 2019: 31).
- In England and Wales between 2008 and 2018, the number of young people (aged 10–17) entering the youth justice system for the first time fell by 86 percent and the number of total proven offences fell by 75 percent (Ministry of Justice United Kingdom 2019: 12, 20).
- In the United States between 2009 and 2018, the number of young people (under 18) arrested fell by 60 percent (United States Office of Juvenile Justice and Delinquency Prevention 2020).

Although it may appear that the decline in the rate of young people proceeded against by police in Australia is lagging behind the progress made in other jurisdictions, it must be noted that the base rate of young people proceeded against by police in Australia a decade ago had been significantly lower than those of its overseas counterparts. For example, in the United States, the arrest rate of young people was 5,343 per 100,000 population in 2008, while in Australia the rate was 3,187 per 100,000 population in the same year (ABS 2020; United States Office of Juvenile Justice and Delinquency Prevention 2020). A decade onwards, the arrest rates in the United States and Australia are more comparable at 2,167 per 100,000 population and 2,045 per 100,000 population, respectively (ABS 2020; United States Office of Juvenile Justice and Delinquency Prevention 2020).

As the number of young people coming to the attention of police in Australia has declined over the last decade or so, the numbers of young people entering youth justice systems has also fallen. On an average day in 2008–09, there were 27 per 10,000 young people under some form of youth justice supervision (either supervision in the community or detention) throughout Australia. By 2017–18, this had fallen to 21 per 10,000 young people, which is a decline of 22 percent (AIHW 2019b: 34).

These trends provide important context for consideration of contemporary practices in Australian youth justice systems. Falls in crime and falling rates of young people entering youth justice systems are welcome trends in light of some of the findings arising from the various recent reviews, especially those focused on the operation of youth detention facilities (discussed below).

Methodology

In recent years, almost all Australian states and territories have undertaken some form of review or inquiry into their youth justice systems. We examined the reports arising from these reviews and inquiries to identify some of the broad themes and trends that are pervasive throughout contemporary Australian youth justice systems.

Key reviews and inquiries into particular Australian youth justice systems (or particular aspects of Australian youth justice systems) in the last five years were identified and findings and recommendations analysed. A full list of the reviews and inquiries considered is listed below in Table 1.

Table 1: Key reviews and inquiries into Australian youth justice systems 2016–19

New South Wales

- Ministerial Review into the riot at Frank Baxter Detention Centre 21 and 22 July 2019 by former NSW Police Force Assistant Commissioner Lee Shearer APM (Shearer 2019)
- Inquiry into the adequacy of youth diversionary programs in New South Wales by Parliament of New South Wales, Legislative Assembly Committee on Law and Safety (LACLS) (2018)
- Use of force, separation, segregation and confinement in New South Wales youth justice centres by the New South Wales Inspector of Custodial Services (2018)
- Re-integrating young offenders into the community after detention by the New South Wales Auditor-General (Audit Office of NSW 2016)

Table 1: Key reviews and inquiries into Australian youth justice systems 2016–19 (cont.)

Victoria

- Managing rehabilitation services in youth detention by the Victorian Auditor-General's Office (VAGO) (2018)
- Inquiry into Youth Justice Centres in Victoria by Parliament of Victoria, Legislative Council Legal and Social Issues Committee (LSIC) (2018)
- Victoria youth justice review and strategy: Meeting needs and reducing offending. Report by former Secretary of the Department of Justice and Regulation Penny Armytage and Professor James Ogloff AM (see Armytage & Ogloff 2017a, 2017b, 2017c, 2017d)
- Review of the Parkville Youth Justice Precinct: An independent review by former Victoria Police Chief Commissioner Neil Comrie AO, APM (Comrie 2017)

Queensland

- Report on youth justice by former Queensland Police Service Commissioner Bob Atkinson AO, APM (Atkinson 2018)

Western Australia

- Inspection of Banksia Hill Detention Centre by the Western Australia Office of the Inspector of Custodial Services (2018)
- Diverting young people away from court by the Office of the Auditor-General Western Australia (2017)

Tasmania

- Youth at risk strategy paper by the Tasmanian Government (2017)
- Custodial youth justice options paper by Noetic Solutions (2016)

Northern Territory

- Royal Commission into the Protection and Detention of Children in the Northern Territory (RCPDCNT) (see RCPDCNT 2017a, 2017b, 2017c, 2017d)
- Reports by civil society, non-government, oversight and other organisations
- What children and young people in juvenile justice centres have to say by the NSW Advocate for Children and Young People (2019)
- The sky is the limit: Keeping young children out of prison by raising the age of criminal responsibility by Amnesty International Australia (2018)
- The children's report: Australia's NGO coalition report to the United Nations Committee on the Rights of the Child by the Australian Child Rights Taskforce (2018)
- Free to be kids: National plan of action by the Change the Record Coalition (2017)
- Pathways to justice: An inquiry into the incarceration rates of Aboriginal and Torres Strait Islander Peoples by the Australian Law Reform Commission (2017)
- A statement on conditions and treatment in youth justice detention by the Australian Children's Commissioners and Guardians (2017)
- Australian child rights progress report: A report on the 25 years of the UN Convention on the Rights of the Child in Australia by the Australian Child Rights Taskforce (2016)

Many of the recent reviews and inquiries had been instigated by the occurrence of high-profile adverse incidents (such as riots) in youth detention centres. Some of these incidents sparked reviews into the practices and policies of the particular detention centre itself or a particular aspect of youth justice (such as the use of force in detention or diversion), while other incidents prompted a review into the youth justice system in its entirety. For example, the Royal Commission into the Protection and Detention of Children in the Northern Territory (RCPDCNT) (2017a, 2017b, 2017c, 2017d) examined the Northern Territory's youth justice system as a whole. Similarly, Armytage and Ogloff (2017a, 2017b, 2017c, 2017d) undertook a review of the Victorian youth justice system with findings published in the report *Victoria youth justice review and strategy: Meeting needs and reducing offending*. Given the breadth and scope of the two aforementioned reviews, regular reference will be made to them throughout this article.

A content analysis methodology was used to examine the findings and recommendations found in the reports and inquiries into the Australian youth justice systems identified in Table 1. Content analysis is often used to identify key themes found in communication content by allowing large amounts of data to be examined in a systematic manner (Weber 1990). For this paper, all the central findings and recommendations from the reviews and inquiries listed in Table 1 were tabulated and then sorted into broad topics, such as diversion, rehabilitation, detention and so on. The data within each broad topic were then coded and analysed for the emergence of key themes and narratives that were consistent throughout the jurisdictions.

This paper provides a summary of some key themes emerging from the numerous reviews and inquiries. This was a difficult task given the breadth and volume of the reports. Hundreds of recommendations and many thousands of pages of material and findings accumulated across the reports. In order to summarise all the findings and the occasionally conflicting recommendations concisely in the limited scope of this paper, some generalisations have been made and some nuance has been unavoidably lost.

Themes from recent inquiries

Running through many of the recent reviews and inquiries listed in Table 1 are a number of common themes and some key differences. This paper addresses some of these themes, as follows:

- Young people who enter youth justice systems, especially those who serve some period in detention (either on remand while they await a court appearance or once sentenced), frequently present with an array of vulnerabilities and complex needs.
- These vulnerabilities might be exacerbated by spending time in custody, especially in segregation and isolation. This is particularly the case for Aboriginal young people, who continue to be massively over-represented in youth justice systems across Australia.
- Consequently, detention should be a last resort option. To ensure that youth justice detention is used as a last resort, recommendations from reviews included that:
 - the minimum age of criminal responsibility should be raised;
 - diversion should be more frequently used, where appropriate; and
 - alternatives to being remanded in custody should be employed more often.
- In the instances where detention is required, then youth justice detention centres should:
 - provide appropriate programs to all detainees;
 - properly train and supervise staff;
 - have systems in place to ensure operational integrity is maintained; and
 - make education programs available to as many detainees as possible and for as long as possible.

While there was widespread agreement across the many reviews and inquiries about the themes outlined above, there were also some critical areas of disputation. In particular, and importantly, there was some divergence across the reviews with regard to what should be the overall operating philosophy of youth justice systems. Broadly put, one approach favoured focusing on the experiences of trauma and victimisation needs of young people, while the other favoured focusing on the criminogenic risks and needs of young people. These different approaches will be discussed in some detail.

Vulnerabilities and complex needs

There was considerable agreement across the reviews and inquiries that young people entering youth justice systems (especially detention facilities) are a vulnerable population group who are likely to have a number of complex needs. A significant proportion of the young people in the Australian youth justice systems come from challenging home circumstances, including dysfunctional family environments, histories of familial offending, exposure to family violence, unstable accommodation or homelessness, and socio-economic disadvantage or poverty (Armytage & Ogloff 2017a: 8–9). Similarly, it is not uncommon for this group of young people to also be struggling with alcohol and substance misuse, mental health issues, cognitive disabilities, childhood abuse and/or neglect, and disrupted education (Armytage & Ogloff 2017a: 8–9; LSIC 2018: 7; RCPDCNT 2017b: 116–117). A 2015 NSW Health survey of young people in custody found that 83 percent had at least one psychological disorder, 68 percent had experienced abuse or neglect in childhood, and almost 17 percent had an IQ under 70 points, which indicates potential intellectual disability (NSW Health & NSW Juvenile Justice 2016).

In addition to these challenges, many reviews and inquiries highlighted the plight of ‘cross-over kids’ who first had contact with child protection systems and then entered youth justice systems. An AIHW report compared a total of 58,193 child protection and youth justice records between July 2014 and June 2018 across seven Australian jurisdictions and found that young people who had contact with child protection services were nine times more likely than the general population to be under youth justice supervision (AIHW 2019a: 13). It also found that approximately half of the population under youth justice supervision had also received child protection services some time during the four-year period (AIHW 2019a: 6).

Similarly, the Victorian Sentencing Advisory Council found that young people who were first sentenced between the ages of 10 and 13 were likely to have been known to child protection services. In the 2016 and 2017 calendar years, 54 percent were subject to a child protection report, 38 percent were subject to a child protection order, 33 percent had been in out-of-home care, and 26 percent had experienced residential care (Victorian Sentencing Advisory Council 2019: xxiv).

Detrimental impacts of detention

The landmark Royal Commission (RCPDCNT) in 2017 highlighted the failure of Northern Territory youth justice detention centres to keep children safe. The RCPDCNT was tasked to review the territory’s youth detention and welfare system over a period of 10 years from 1 August 2006 (RCPDCNT 2017b: 53). The RCPDCNT found that youth justice detention centres in the Northern Territory were completely ‘not fit’ for accommodating young people, let alone rehabilitating them (RCPDCNT 2017b: 12). It also found sustained patterns of abuse, humiliation, denial of basic human needs, and long-lasting physical and psychological damage. The detention centres were described as ‘poor’, ‘unsatisfactory’, ‘unsuitable’, ‘oppressive’, ‘appalling’, ‘dangerous’ and ‘deplorable’ by witnesses to the commission (RCPDCNT 2017c: 80). The RCPDCNT recommended the closure of the Don Dale Youth Detention Centre by February 2018 (RCPDCNT 2017c: 102).

While the Don Dale Youth Detention Centre was one of the more egregious cases, other detention centres around the country, such as Banksia Hill in Western Australia, Frank Baxter in New South Wales and Parkville in Victoria, have also faced significant scrutiny in recent years (Comrie 2017; Shearer 2019; Western Australia Office of the Inspector of Custodial Services 2018). These reviews, and the practices and conditions precipitating them, highlight the potentially criminogenic nature of youth justice detention centres which entrench young people further in disadvantage (Baldry et al. 2018; Cunneen, Goldson & Russell 2016), especially for those on remand (ie unsentenced). Young people on remand are likely to be exposed to the detrimental effects of detention but are not there long enough to gain any substantial therapeutic or rehabilitative benefit (Armytage & Ogloff 2017a: 15).

Within youth justice detention centres, young people may be removed or separated from other detainees for punishment, protection or security purposes. Separation is used in situations where the young person needs to be removed from the general population for the safety, security and good order of the detention centre (Audit Office of NSW 2016: 15). Segregation is used to protect the personal safety of the young person and confinement is used for the purposes of punishment for misbehaviour (Audit Office of NSW 2016: 15). There are regulations in each jurisdiction that govern the minimum conditions that must be adhered to when young people are either separated, segregated or confined. For example, young people under the age of 16 can be confined for up to 12 hours and young people over the age of 16 can be confined for up to 24 hours in New South Wales (Audit Office of NSW 2016: 15). In 2018, the NSW Inspector of Custodial Services found that confinement was overused as a form of punishment (despite a number of alternative punishment options being available) and often relied upon as a way to manage young people exhibiting challenging behaviour (NSW Inspector of Custodial Services 2018: 16).

The overuse of separation, segregation and confinement to manage young people can be associated with a number of negative impacts—the prolonged use of isolation can impact the physical and psychological health of the young person, as well as their social and education development (NSW Inspector of Custodial Services 2018: 17).

Indigenous over-representation

According to the Australian Child Rights Taskforce (ACRT), the continued over-representation of Indigenous young people in the youth justice system should be considered ‘a national crisis’ (ACRT 2018: 13). Although this has been acknowledged as a key issue by all major reviews and inquiries, there has been limited success in effecting significant change in the persistent over-representation of Indigenous young people in the youth justice population (ACRT 2018). In 2017–18, Indigenous young people represented approximately five percent of all people aged 10–17 in Australia. Yet they constituted 49 percent of the population of young people under supervision, both in the community and in custody and were 23 times more likely than non-Indigenous young people to be in detention (AIHW 2019b: 9).

The historical and ongoing effects of colonisation, broken connection to country and community, and the ensuing cycle of intergenerational trauma and exclusion from mainstream culture cannot be understated (Armytage & Ogloff 2017b: 174). The RCPDCNT emphasised how the ‘destabilisation’ and ‘history of control’ of Aboriginal communities has resulted in ‘chronic disadvantage’ relating to Aboriginal people’s levels of physical and mental health, disability, employment, housing and education (RCPDCNT 2017b: 116). The Australian Child Rights Taskforce (2018: 13) has described the need to address the impacts of intergenerational disadvantage as ‘critical’ and ‘urgent’. The complexity of this problem derives from the numerous interrelated and entrenched structural issues that cannot be remedied with short-term measures.

Detention as a last resort

The United Nations Standard Minimum Rules for the Administration of Juvenile Justice (United Nations 1985) (the Beijing rules) and the Convention on the Rights of the Child (United Nations 1989) (see also United Nations Committee on the Rights of the Child 2019) states that detention should be considered only as a last resort option for young people. This is because extensive research has found that detention is damaging and criminogenic, serving to entrench young people further in disadvantage (Baldry et al. 2018; Cunneen, Goldson & Russell 2016). Recent reviews and inquiries reaffirm the importance of detention being used only as a last resort and make some key recommendations to help achieve this objective.

Raising the minimum age of criminal responsibility

One way of reducing the footprint and impact of the Australian youth justice systems is to raise the minimum age of criminal responsibility. The current minimum age of criminal responsibility in Australia is 10 years of age. Notwithstanding that *doli incapax*—the rebuttable presumption of innocence—is in place for children aged 10–14 throughout all jurisdictions in Australia (see, for example, *Criminal Code Act 1995* (Cth), sch 1; Crofts 2018; Richards 2011), children as young as 10 can be and are placed in youth justice detention (AIHW 2019b). In 2017–18, approximately seven percent or 411 young people under supervision on an average day were aged between 10 and 13 (AIHW 2019b).

Currently, there is growing pressure to raise the minimum age of criminal responsibility in Australia. By way of comparison, the minimum age of criminal responsibility in New Zealand and the United Kingdom is also 10 years of age (Child Rights International Network 2019). Many of the states in the United States do not have a set minimum age of criminal responsibility but, in the states that do have a legislated minimum age of criminal responsibility, it ranges from 6 to 10 years of age. In Canada, the minimum age of criminal responsibility is set slightly higher at 12 years of age. Similarly, the age of criminal responsibility is set at 12 years or above in almost all European countries. Most notably, the minimum age is 15 in the Nordic countries (with the exception of Denmark, at 14), and 14 in Spain, Italy and Germany. In some other countries globally the minimum age is even higher, at 16 years in Argentina, and as high as 18 in Peru and Chile (although children over 14 can be subject to punishment for offending behaviour) (Child Rights International Network 2019).

Australia's current minimum age of criminal responsibility would therefore appear to be 'anomalous with global norms' (Cunneen 2017: 2) and various recent reviews have called for it to be lifted. The *Report on youth justice* in Queensland by Bob Atkinson (2018: 13) and the RCPDCNT (2017a: 46) both recommended that the age of criminal responsibility be raised to 12 years of age. The United Nations Committee on the Rights of the Child (2007) has recommended an absolute minimum of 12 years, and Amnesty International Australia (2018) has recommended it be raised to 14 years, which is the median age across 86 countries worldwide (Cunneen 2017: 2–3). Furthermore, it is argued that children aged 10–12 have not reached a stage of developmental maturity appropriate for them to be considered legally responsible for their offending behaviour (Atkinson 2018: 105).

Greater use of diversion

Another way to reduce the number of young people entering youth justice detention centres is through the use of diversion. The rationale is to divert young people away from traditional criminal justice interventions and ideally into programs aimed at helping them take responsibility for their actions, make reparations for the harm they caused, and limit their chance of becoming entrenched in the justice system (RCPDCNT 2017d: 249). Diversionary measures are largely employed at particular stages of the criminal justice process, such as initial police contact and pre-sentencing.

In the Northern Territory in 2015–16, 35 percent of 2,082 children and young people were diverted after coming into contact with the police (RCPDCNT 2017b: 27). According to the RCPDCNT, the ‘vast majority’, around 85 percent, of diverted young people did not reoffend (2017b: 27; 2017d: 259). Other reviews and studies have similarly demonstrated the success of diversion (see, for example, Atkinson 2018: 23; Cunningham 2007; LSIC 2018: 34; Lulham 2009; Vignaendra & Fitzgerald 2006; Wilson, Brennan & Olaghere 2018; Wilson & Hoge 2013). Accordingly, the Inquiry into Youth Justice Centres in Victoria (2018) noted that diversion can lead to safer communities, is more cost-effective than custodial sentences and can be specifically designed to reduce Aboriginal over-representation (LSIC 2018).

However, police diversionary mechanisms (cautions or referrals to other services) are often underused or not used systematically (Office of the Auditor General Western Australia 2017). The reviews illuminated how the currently limited and often ‘ad hoc’ approaches to diversionary programs can represent a ‘missed opportunity to intervene’ and limit future contact with the youth justice system (Armytage & Ogloff 2017a: 23).

Reducing the remand population

The proportion of young people remanded to youth justice custodial centres has been increasing in recent years. In some jurisdictions this population now represents close to half or more of the young people in detention on any single day (AIHW 2019b: 16). Remand periods are often relatively short but can be disruptive and of little rehabilitative value. A young person remanded in custody will often have their schooling, employment, residential and other circumstances disrupted, and they will often be ineligible to participate in educational, vocational or rehabilitative programs while on remand.

Given that many young people end up in detention for breaching their bail conditions such as curfew requirements (LACLS 2018: 52), as opposed to committing a new offence, strategies could be put in place to remind young people of their bail conditions (RCPDCNT 2017a: 42). Similarly, lack of suitable accommodation has persistently been a factor preventing young people from being granted bail—this particularly affects Aboriginal young people, young people in regional areas and young people with complex needs or offending histories (LACLS 2018: 49). Programs to help place young people in suitable accommodation, nominating multiple addresses on bail residence conditions, and training for police and courts on setting appropriate bail conditions would assist in keeping young people in the community rather than being remanded in detention (LACLS 2018: 51).

In the instances where young people are remanded in custody, a number of recommendations have been made. These include ensuring young people in remand have access to rehabilitative programs and vocational education services while in detention (Armytage & Ogloff 2017a: 33; LACLS 2018: 9; RCPDCNT 2017a: 35), developing a suite of non-offence specific offending behaviour programs for them (Armytage & Ogloff 2017a: 54) and ensuring there is greater use of tailored case management and release planning for this group (RCPDCNT 2017a: 36).

Improving youth justice detention

While numerous reviews and inquiries reaffirmed that detention should be used as a last resort, there is a continuing need to detain some young people. In these circumstances, every effort should be made to enhance the experience.

The Parliament of Victoria's Legal and Social Issues Committee and the Tasmanian Youth at Risk Strategy recommended that detention should adopt a therapeutic rather than punitive approach for the purposes of reducing reoffending (LSIC 2018; Tasmanian Government 2017). The LSIC (2018) found that, for some young people, detention actually signifies the first period of stability in their lives with consistent access to educational or therapeutic programs. Similarly, Armutage and Ogloff (2017a: 25) identified a range of features that can augment the benefits of detention, such as having a clear operating philosophy, skilled workers, a structured day, rigorous assessment of young people and clear behavioural management.

The following sections focus on three broad areas where improvements could be made: provision of programs, delivery of education and having suitably trained and supervised staff.

Provide appropriate programs and adequately resourced services to all detainees

The lack of appropriate programs and services for young people in detention was a common theme throughout the reviews, inquiries and reports (Armutage & Ogloff 2017a, 2017c; Atkinson 2018; LSIC 2018; RCPDCNT 2017a, 2017c; VAGO 2018). For example, Armutage and Ogloff (2017a: 18–19) found that there was a lack of programs to address offending behaviour in the Victorian youth detention setting, particularly for high-risk offenders. Additionally, the group structure in which the programs were delivered to detainees was described as 'lacking', as there is limited opportunity to instil behavioural change in young people when they are with their peers (Armutage & Ogloff 2017a: 19).

The current range of programs available to young people in detention is insufficient and does not adequately address the complex needs of the population group, which can have implications for rehabilitation and reducing reoffending (VAGO 2018: 8). Program and service deficiencies in youth justice detention centres may be the product of insufficient resources and/or facilities, prioritising security over rehabilitation, and inefficient case management and needs assessment (VAGO 2018: 8).

The various reviews also highlighted the need for programs that connect Aboriginal young people to culture and country, which may help address the over-representation of Aboriginal young people in detention (Armutage & Ogloff 2017a: 19; Shearer 2019: 15).

Make education programs available to as many detainees as possible for as long as possible

The provision of consistent education in youth justice detention is critical for the purposes of rehabilitating young people and reducing their risk of reoffending (Armutage & Ogloff 2017a: 18). Education in detention can lead to better future employment outcomes, and increased literacy and numeracy levels among a population who have had disrupted and limited contact with education services in the past. Moreover, there is research to indicate that young people with higher educational attainment in detention are more likely to continue their education upon release and have a lower rate of arrest (VAGO 2018: 21).

In response to the youth justice review conducted by Armytage and Ogloff in 2017, the Victorian government invested an additional \$50 million to reform the youth justice system (VAGO 2018: 8). Part of the reform related to the operation of Parkville College. Parkville College is a specialist secondary school for all young people in detention in Victoria. It offers classes six days a week and is open 52 weeks a year (VAGO 2018: 71). Learning materials have been tailored to the specific needs of young people in detention—Parkville College recognises that the young people are likely to have lower levels of literacy and numeracy and aims to provide content that is age appropriate, culturally and gender diverse, and reflects their unique life experiences (VAGO 2018: 68). Moreover, Parkville College student results are on average four times higher than expected under the Australian Core Skills Framework (VAGO 2018: 68). Such positive results indicate that the education model and materials employed in Parkville College have been effective in engaging young people and giving them greater opportunities to succeed upon release.

Properly train and supervise staff

The importance of having adequately trained and supervised staff in detention centres was a recurring theme among the recent reviews, reports and inquiries into Australian youth justice systems. Working in a custodial environment can be demanding; detainees may exhibit challenging behaviour and have numerous, complex needs (Shearer 2019: 15). In the absence of comprehensive training, youth officers are not adequately equipped and skilled to respond appropriately to detainees or to any unexpected incidents, which can pose further risk to both staff and detainees (Shearer 2019: 15).

Training requirements to become an officer in a youth detention centre have been found to be patchy and insufficient (Aramytag & Ogloff 2017a: 19; NSW Inspector of Custodial Services 2018: 13; Shearer 2019: 15). In New South Wales, there are no specific education, training or skill requirements to become a youth officer, thus there may be people who work in youth justice detention centres who have had limited prior experience working with young people, let alone a group with complex needs (NSW Inspector of Custodial Services 2018: 13). In Victoria, working in youth detention centres involves an eight-week training program (Shearer 2019: 15).

The review into the riots at Frank Baxter Juvenile Justice Centre in New South Wales found that, in many instances, staff had been tasked to perform duties or activities they did not have adequate training or experience for and there were no other staff present to take on the task (Shearer 2019: 15). Similarly, the NSW Inspector of Custodial Services found that many incidents where force had been used in detention centres could have been avoided if staff had received more training in trauma-informed practices, negotiation skills and de-escalation techniques (NSW Inspector of Custodial Services 2018: 13).

Furthermore, the Shearer review found that there had been an increase in the employment of casual and temporary staff within New South Wales youth justice detention centres, while the number of permanent and ongoing positions had decreased in the previous three years (Shearer 2019: 17). These conditions have implications for the training provided to staff, the ability of staff to build rapport with detainees as they are not present as often, increased staff turnover and casual staff not wanting to raise concerns due to the fear of being perceived as difficult (Shearer 2019: 17).

Offenders or victims first?

One major area where there was a divergence of views across the inquiries and reviews pertains to the overarching operating philosophy of youth justice systems. Broadly put, one approach favours a focus on addressing the criminogenic risks and needs of young people, while the other is more welfare-oriented and is guided by trauma-informed practice.

According to the 'what works' literature on reducing youth offending, the prevailing view is that young people have eight key categories of criminogenic risk factors and needs (the 'Central Eight') that can be correlated with their offending behaviour (Bonta & Andrews 2007). Thus, effective interventions and rehabilitation initiatives must identify and limit the influence of these risk factors on a young person's life (Bonta & Andrews 2007).

Andrews, Bonta and Hoge (1990) developed the risk–need–responsivity (RNR) model for effective offender rehabilitation. This well-researched model is the predominant model used in New South Wales and was recommended by Armytage and Ogloff (2017a) in their review of the Victorian youth justice system. The RNR model is centred around addressing the Central Eight criminogenic risk factors that are most likely to influence future reoffending behaviour. Among this group of criminogenic risk factors, four are considered to most strongly influence offending behaviour. These are often referred to as the 'Big Four' and include antisocial personality patterns, pro-criminal attitudes, social supports for crime and a history of antisocial behaviour (Bonta & Andrews 2007). In addition to the Big Four risk factors, there are four remaining criminogenic risk factors that moderately contribute to reoffending behaviour, and these are often termed the 'Other Four': problematic family relationships or circumstances, problems at school or work, lack of prosocial recreational activities and substance abuse (Bonta & Andrews 2007).

Armytage and Ogloff (2017a: 12), in their review of the Victorian youth justice system, argued that youth justice has 'lost its focus on responding to criminogenic needs' as there is an 'overemphasis' on welfare and extrinsic needs. In line with the RNR model, they contended that without first addressing criminogenic risk factors, welfare-based interventions cannot be entirely effective. They recommended that interventions directed at the young person's criminogenic needs should be the focal point, while being simultaneously supported by a suite of welfare programs. In the absence of ongoing support for the management of offending risk, Armytage and Ogloff (2017a) argued that welfare interventions cannot provide young people with the tools to address their own behaviours. Moreover, Armytage and Ogloff (2017a) contended that while trauma-informed practice is important, an overemphasis on trauma negates young people's ability to take responsibility for their own actions, problematically perpetuating the narrative that all young people are victims.

There are several other models of youth justice that have been developed and implemented internationally and which place greater emphasis on non-criminogenic needs. For example, the 'Good Lives Model' emphasises the importance of a holistic and therapeutic approach to rehabilitation (Ward & Maruna 2007). It focuses on 'human goods', such as agency, quality relationships and a purpose-filled life, to reduce the risk of reoffending (White & Graham 2010).

Similarly, the 'Children First, Offenders Second' approach (a subset of Positive Youth Justice) places limited focus on the importance of risk and/or punishment; instead, it recognises the vulnerability of children, and emphasises that all youth justice services should be 'children first', trauma-informed, rights-based, and operate in young people's best interests (Case & Haines 2014; Haines & Case 2015). The broad purpose of a trauma-informed approach to treatment is to ensure that, at the system level, all aspects of youth justice interventions consider the impact of adversity experienced by the young person and attempt to ameliorate this harm (Wall 2016). The ideal is not simply to implement specific interventions that are trauma-informed, but to embed this way of thinking in organisations and systems (Wall 2016). Overall, these approaches reflect the argument that without appropriate and widely available community programs or health and welfare services, young people with multiple disadvantages will continue to be 'excessively criminalised' and subject to 'cruel and unusual punishment' in the youth justice system (Baldry et al. 2018: 648).

Consistent with these approaches, some of the Australian youth justice reviews recommended adopting a ‘trauma-informed’ perspective (see Atkinson 2018; RCPDCNT 2017a). At the outset, from this perspective, young people should be first seen as ‘victims of circumstance’ and disadvantage, rather than being viewed as offenders (Atkinson 2018: 105). In general, these reviews considered young offenders to be victims of their environments and their offending behaviours as by-products of their socio-economic disadvantage and/or trauma. Therefore, proponents of this perspective argue that youth justice measures should account for this disproportionate disadvantage by responding first to their complex, non-criminogenic needs. Such a philosophy diverges from the RNR model, which is an offenders-first approach that aims to address and mitigate the influences of criminogenic risk on a young person’s behaviour before targeting their non-criminogenic needs (Haines & Case 2015).

Conclusion

This paper has outlined a number of key system-level issues that have emerged from the hundreds of recommendations emanating from various reviews and inquiries made over several years across the Australian states and territories.

All of the reviews and inquiries recognised that the young people who find themselves in contact with youth justice systems are a vulnerable population, often with multiple and complex needs. Such vulnerability and disadvantage can be further exacerbated by the detrimental impacts of detention. Inquiries into the Don Dale Youth Detention Centre in the Northern Territory, Frank Baxter in New South Wales, Parkville in Victoria and Banksia Hill in Western Australia have revealed the potential criminogenic effects these facilities can have on the young people who are detained in them.

The detrimental effects of detention on young people have resulted in the various reviews and inquiries recommending that detention should only be used as a last resort. The use of detention as a last resort will also assist in addressing the continued over-representation of Indigenous young people in the youth justice system. Other ways of addressing this over-representation include increasing the age of criminal responsibility, increasing the use of diversion and reducing the remand population, which were all common recommendations across a number of the reviews and inquiries.

Despite the principle that detention should be used as a last resort, there will always be continued need for detention centres for a small number of young people. In order to maximise the rehabilitative benefits of detention centres, the reviews and inquiries made a number of recommendations. It was recommended that appropriate programs and services be provided for all young people in detention—including education programs, programs to address their complex needs and reoffending behaviour, as well as culturally responsive programs for the significant proportion of Indigenous young people in custody. Additionally, the importance of having adequately trained and supervised staff in detention centres was a recurring recommendation among the reviews and inquiries.

Finally, achieving a shared philosophy across all agencies and actors in the youth justice system is a significant challenge, not least because there is considerable debate as to whether young people entering the youth justice system should primarily be treated as offenders or victims.

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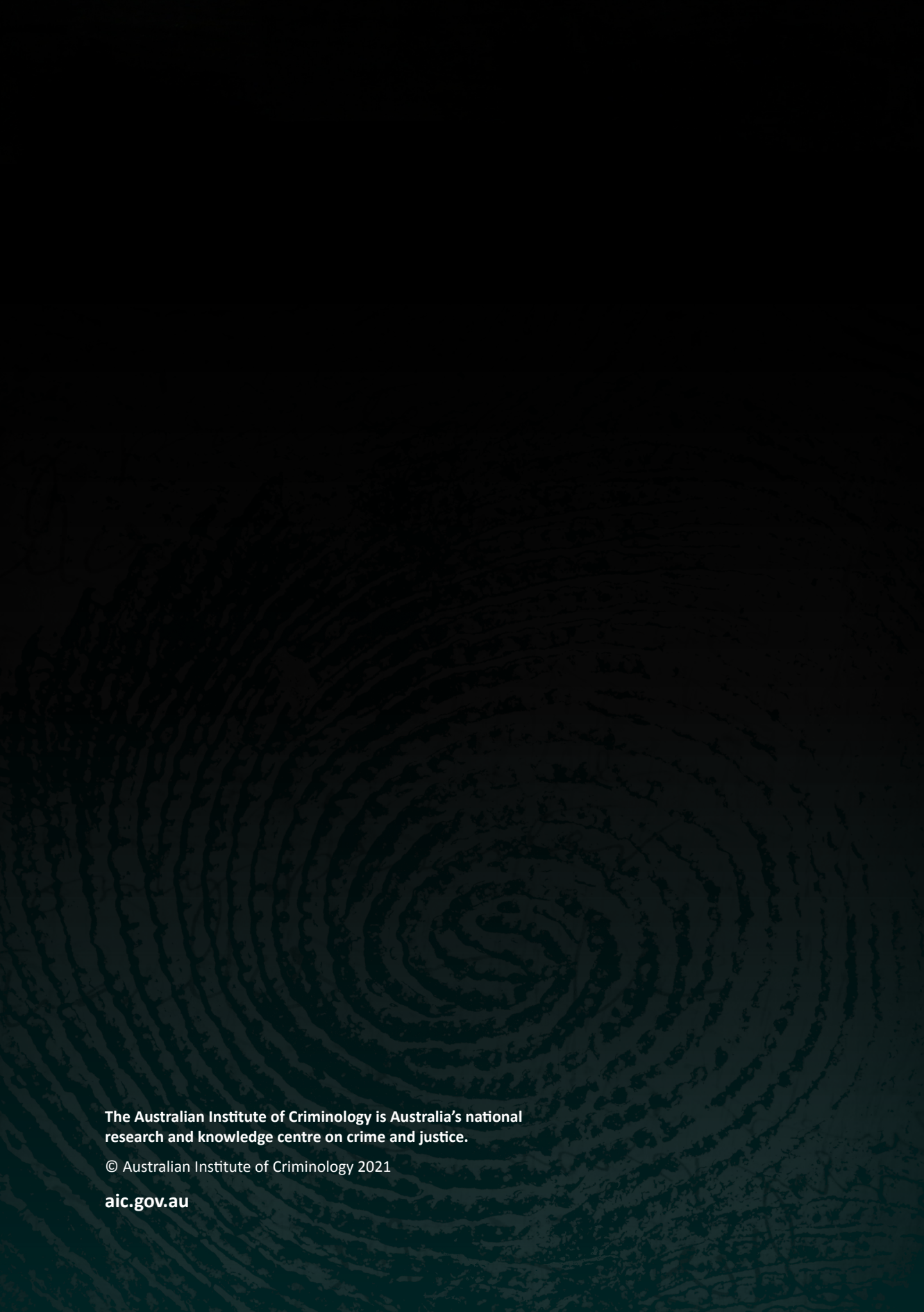
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