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**Towards a theory of  
Indigenous contact with  
the criminal justice system**

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*Celebrating*  
**50** years

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## **Conflicts of interest**

None to declare.

# Abstract

The Australian Indigenous imprisonment rate is currently 16.7 times the non-Indigenous imprisonment rate. The leading proximate cause of this over-representation is a high rate of Indigenous arrest. In this report we develop and test a model of Indigenous arrest in which the primary drivers of risk are substance use, stress and trauma, adverse social environment, exposure to arrest, human/economic/social capital, and state/territory of residence. We test the model using data from the 2014–15 National Aboriginal and Torres Strait Islander Social Survey. The strongest risk factors are alcohol and other drug use and having a high or very high level of psychological distress. The strongest protective factors are completing school, having an income in the top four deciles, and having a permanent home.

# Executive summary

The Australian Indigenous imprisonment rate is currently 16.7 times the non-Indigenous imprisonment rate. The leading proximate cause of this over-representation is a high rate of arrest. Only five of the eight Australian states and territories publish data on Indigenous rates of arrest, but in these jurisdictions the ratio of Indigenous to non-Indigenous arrest rates ranges between seven in Queensland and 14.3 in South Australia. In other words, this means an Indigenous Australian living in Queensland is seven times more likely to be arrested than a non-Indigenous person living in Queensland, while in South Australia the risk of arrest for Indigenous Australians is more than 14 times higher than that of their non-Indigenous counterparts. Among those who are arrested, most are arrested multiple times. In the two-year period 2020–21 to 2021–22, the average frequency of Indigenous arrest ranged between 1.7 in the Northern Territory and 2.5 in New South Wales. Non-Indigenous arrest frequencies are significantly lower. The higher Indigenous re-arrest rate generates a higher rate of bail refusal and imprisonment, thereby exacerbating the over-representation of Indigenous Australians in prison.

Though the point is often overlooked, most Indigenous Australians are never arrested or imprisoned. It is impossible to understand Indigenous over-representation in prison without coming to grips with the factors that differentiate those who are arrested and, in many cases, imprisoned, and the majority who are not. In this report we outline and evaluate a preliminary theory of Indigenous arrest. The explanation we give treats Indigenous arrest as the interplay of two sets of factors, one of which increases the risk of arrest and the other of which reduces that risk. The first set includes factors such as age, gender, psychological distress, membership of the stolen generation, illicit drug use, alcohol use and state and territory laws and policies. The second (protective) set includes social embeddedness, income, school completion, marital status and living conditions that reduce contact with police.

We evaluate the theory using the National Aboriginal and Torres Strait Islander Survey (NATSIS), a large nationally representative survey of Indigenous Australians. The results are largely consistent with the explanation we put forward. The risk of arrest is higher for males than females, rises to a peak around 21–30 years, and declines rapidly thereafter. Illicit drug and alcohol use increases the risk of arrest, as does a high level of psychological distress, being a member of the stolen generation, living in a problem-affected neighbourhood and having a higher level of exposure to police. The risk of arrest is lower among Indigenous Australians who are married, who have never been homeless, who have people they feel they can confide in, who have completed school, and who have an income in the top four deciles.

The strongest risk factor is having used illicit drugs and alcohol over the preceding 12 months, which increases the marginal risk of arrest by 14 percentage points. The marginal effect of using illicit drugs and alcohol on arrest risk is even higher (17.2%) among those aged 21–30 and among those who are members of the stolen generation. The strongest protective factor is school completion, which reduces the risk of arrest by 7.9 percentage points. Even after controlling for sex, age, substance use, psychological distress, membership of the stolen generation, neighbourhood problems, homelessness, remoteness, marital status, social embeddedness, school completion and income, there are marked differences between the states and territories in the likelihood of arrest. After adjusting for the factors just mentioned, the odds of arrest in South Australia, for example, are 37 percent higher than in Tasmania.

Measures to reduce illicit drug and alcohol use, improve school retention and improve economic outcomes for Indigenous Australians are essential if Australia is to achieve any long-term reduction in the scale of Indigenous over-representation in prison.

# Introduction

Between 2012 and 2022, the Indigenous imprisonment rate in Australia grew by 24 percent (Australian Bureau of Statistics 2023a). The Indigenous imprisonment rate (2,329.6/100,000 population) is now almost 17 times the non-Indigenous imprisonment rate (139.6/100,000 population). We know a great deal about the characteristics that put non-Indigenous people at risk of contact with the criminal justice system (Ellis, Farrington & Hoskin 2019). There is also a growing body of research on Indigenous victims of crime (Buxton-Namisnyk 2022). Research studies on the factors that lead to Indigenous contact with the criminal justice system, however, are few and far between. This is unfortunate because, while one might expect to see some similarity between the factors associated with non-Indigenous and Indigenous offending, the developmental, social, economic and cultural experiences of those who have been colonised and dispossessed are likely to be very different from those of the colonisers and their descendants (Homel, Lincoln & Herd 1999).

Past research on Indigenous over-representation in prison has tended to focus on what happens to Indigenous Australians once they reach the criminal justice system. The underlying theme of this research is that Indigenous over-representation in prison is attributable to racial bias in the operation of the system (Allison, Schwartz & Cunneen 2013; Anthony 2010; Blagg et al. 2005; Cunneen & MacDonald 1996; Eggleston 1976; Gale, Bailey-Harris & Wundersitz 1990; Marchetti 2006). Empirical studies of sentencing provide little support for this view. While there is no doubt Indigenous Australians frequently experience racism (Allison, Schwartz & Cunneen 2013), most studies of racial bias in bail and sentencing find relatively small differences between Indigenous and non-Indigenous offenders in the likelihood of bail refusal and imprisonment after adjusting for the effects of relevant legal factors (Bond & Jeffries 2010, 2011a, 2011b; Jeffries & Bond 2009, 2012; McGrath 2016; Snowball & Weatherburn 2006, 2007; Thorburn & Weatherburn 2018; Weatherburn & Snowball 2012b). There are two exceptions. Weatherburn and Thomas (2023) have found that Indigenous juveniles are less likely to be cautioned by NSW police than otherwise similar non-Indigenous Australians. Thorburn and Weatherburn (2018) and Bond and Jeffries (2014) found that Indigenous domestic violence offenders are more likely to be imprisoned than otherwise similar non-Indigenous domestic violence offenders. On the balance of evidence at this stage, however, it seems doubtful that racial bias in bail and sentencing accounts for much of the disparity between Indigenous and non-Indigenous imprisonment rates.

How then do we explain the over-representation of Indigenous Australians in prison? A partial answer can be found in the fact that Indigenous Australians are arrested at almost nine times the rate of non-Indigenous Australians (7,645/100,000 population vs 870.8/100,000 population; Australian Bureau of Statistics 2023b). Even if courts were inclined to ignore the seriousness of an offence and the number of times a person had previously been convicted, this difference in arrest rates would explain around half the gap between the Indigenous and non-Indigenous imprisonment rates. The rest is due to three important facts. Firstly, Indigenous Australians more frequently reappear in court than their non-Indigenous counterparts. In New South Wales in 2021–22, for example, 15.6 percent of Indigenous defendants appearing in court at least once appeared five or more times, compared with 4.9 percent of non-Indigenous defendants (Australian Bureau of Statistics 2023b, Table 26). Secondly, Indigenous Australians appear more often for offences involving violence. The Indigenous arrest rate for ‘acts intended to cause injury’ in South Australia, for example, is 21 times that of non-Indigenous arrestees (Australian Bureau of Statistics 2023b, Table 23). Finally, Indigenous offenders are more frequently arrested for breaching the conditions of court orders (an offence which often results in imprisonment). In Queensland, for example, the Indigenous arrest rate for ‘justice procedure’ offences (most of which involve breaches of court orders) is 6.6 times that of non-Indigenous offenders (Australian Bureau of Statistics 2023b, Table 23). Having a prior criminal record and being convicted of a violent offence reduce the likelihood of bail and increase the likelihood of a prison sentence. What starts out as a ninefold difference in arrest rates ends up being a 17-fold difference in imprisonment rates. The key to understanding Indigenous over-representation in prison, therefore, is understanding the factors driving the high rate of Indigenous arrest. In the next section of this report, we review the limited evidence available on this issue.

## Past research into the correlates of Indigenous arrest

Hunter (2001a, 2001b) was the first to examine the economic and social correlates of Indigenous arrest using a nationally representative survey of Indigenous Australians. His study used data from the National Aboriginal and Torres Strait Islander Survey (NATSIS), a nationally representative survey of Indigenous Australians (Australian Bureau of Statistics 1995). That survey included questions on whether the respondent had been arrested in the past five years and, if so, how many times. It also included questions on the respondents’ demographic characteristics (gender, age, remoteness of residence, proximity to a police station, employment, schooling, alcohol use) and the following experiences:

- having been threatened or assaulted;
- having been removed from their natural family;
- living in a crowded household;
- having household utilities available and working; and
- living with other household members.

The three strongest predictors of arrest were unemployment, having been threatened or assaulted and having consumed alcohol. The 1995 NATSIS employed by Hunter (2001a, 2001b) had three limitations. Firstly, the survey question measuring alcohol use invited a simple 'yes' or 'no' answer. Respondents were not asked how frequently they drank alcohol or how much they consumed. Secondly, the survey included no question about illicit drug use, although one would expect some relationship between positive answers to this question and risk of arrest. Thirdly, the NATSIS simply asked respondents whether they had been arrested in the last five years, not how frequently this had occurred. The 2002 survey (now known as the National Aboriginal and Torres Strait Islander Social Survey, or NATSISS) remedied these problems. Weatherburn, Snowball and Hunter (2008) used the survey to examine the impact of illicit drug and alcohol use on arrest frequency, after adjusting for the effects of age, gender, social involvement, membership of the stolen generation, financial stress, school completion, welfare dependence, unemployment, and employment on Community Development Employment Projects (an Australian Government labour market program that has since been discontinued). They found that the three strongest correlates of arrest were high-risk drinking (compared with medium- or low-risk drinking), welfare dependence and unemployment.

The studies by Hunter (2001a, 2001b) and Weatherburn, Snowball and Hunter (2008) did not include any consideration of the influence of cultural factors (eg living on traditional lands, speaking an Indigenous language, engaging in traditional cultural practices) on the risk of arrest. Ferrante (2013), following earlier work by Broadhurst (1997), discussed the possibility that Indigenous Australians who remained strongly attached to their country and community may experience a higher risk of arrest because such connections were more likely to bring them into resistance against and conflict with police. She acknowledged, however, that cultural strength may also function as a protective factor, since it may help blunt the impact of dispossession and its sequelae. In her analysis of the 2002 NATSISS data she included several culturally specific factors, including membership of the stolen generation (Australian Human Rights Commission 1997), cultural ties, strength of connection to community, and region (major cities, inner regional, outer regional and remote/very remote). She found that those with stronger community ties and connection to the community were, other things being equal, less likely to be arrested (Ferrante 2013). Weatherburn and Snowball (2012a) obtained similar results. As with earlier studies, the strongest correlates of arrest risk and arrest frequency to emerge from the NATSISS analyses were high-risk alcohol consumption and illicit drug use.

# Outline of a theory of arrest

## Earlier theories

The studies just reviewed could all be described as exploratory, in that none was guided by any explicit theory about the causes of Indigenous contact with the criminal justice system. Only two testable theories of Indigenous contact with the criminal justice system have been put forward. Broadhurst (1997) sought to explain the highly punitive treatment of Indigenous Australians in what he called the 'frontier' jurisdictions of Western Australia and the Northern Territory and, to a lesser extent, South Australia, Queensland and New South Wales. Broadhurst's (1997) theory is a welcome contribution to a field where theory-driven empirical research is the exception rather than the norm. Our focus, by contrast, is on the factors responsible for the high rate of Indigenous arrest.

The second theory, put forward by Snowball and Weatherburn (2008), put forward four possible criminological theories that might explain the high levels of violence in Indigenous communities. The theories they identified were cultural theory (Wolfgang & Ferracuti 1967), anomie theory (Durkheim 1965), social disorganisation theory (Agnew 2001; Shaw & McKay 1942) and lifestyle/routine activity theory (Cohen & Felson 1979). We will not dwell here on the details of each of these theories or on how Snowball and Weatherburn (2008) sought to test them. There are, however, two important points to make about their study. The first is that they were focused on factors that affect offending, whereas we are focused on factors that affect arrest. As will become apparent, offending is only one of those factors. The second point is that lifestyle factors, such as illicit drug and alcohol use, may be strongly correlated with aggression and violence but they may also trigger an arrest even in the absence of aggression and violence.

The starting point for any understanding of the factors that influence Indigenous arrest is the original trauma of colonisation and dispossession and its sequelae (Heart et al. 2011; Krieg 2009; Makwana 2019; Menzies 2019). The early stages of dispossession in colonial settings typically involve a combination of massacre, murder and disease (Hunter & Carmody 2015; Karskens 2010; Rowley 1972). In Australia, however, the damage did not end there. Dispossession gave way to mass imprisonment (Finnane & McGuire 2001), the forced relocation of whole communities from their traditional lands onto reserves (Finnane 1997), the forced removal of Indigenous children from their families (Australian Human Rights

Commission 1997) and the rapid exclusion of Indigenous Australians from mainstream employment, particularly after the equal wage case decision (Anthony 2007). (Up until the late 1960s, Aboriginal pastoral workers in the Northern Territory were paid far lower wages than non-Indigenous workers, but ‘allowed’ to live on the properties and maintain their cultural traditions. In March 1966 the then Conciliation and Arbitration Commission handed down a decision requiring Aboriginal workers to be paid the same rates as non-Aboriginal workers. As a consequence, families and whole communities were forced off the properties where they had worked for generations.)

These actions set in train a sequence of events that increased Indigenous Australians’ risk of contact with the criminal justice system, the effects of which are still being felt to this day. In some cases, the events magnified the effect of universal risk factors (eg age, gender). In other cases, they played out through conditions that affect only a small proportion of the non-Indigenous population but a large proportion of the Indigenous population (eg post-traumatic stress). In yet other cases, they arise from the socio-political environment in which Indigenous Australians live. In what follows we consider these matters in more detail.

### *Age and gender*

Young men in every culture are prone to displays of aggression and risk-taking (see, for example, Sitter & Hautala 2016). This increases the likelihood of hostile contact with police, who tend to view young people as a problem to be managed rather than as citizens deserving of respect and support (Richards, Cross & Dwyer 2018). The hostile relationship between Indigenous Australians and the police is partly a reflection of this but is greatly exacerbated by a shared oral history of indiscriminate murder, forced removal, abduction, harassment and police brutality. Much of this harassment and brutality was and is directed at Aboriginal youth (Broadhurst 2002; Cunneen 2001; Green 2019; Jochelson 1997; Karskens 2010; Rowley 1972; Sentas & Pandolfini 2017; Weatherburn 2006). The result is an undercurrent of fear and hostility towards police that puts young Aboriginal men at heightened risk of arrest for even minor breaches of the law.

### *Stress and trauma*

Colonisation and dispossession and their sequelae were traumatic events for Australia’s original inhabitants. As already noted, the effects of that trauma are still being felt. Data from the 2018–2019 National Aboriginal and Torres Strait Islander Health Survey (Australian Bureau of Statistics 2019) reveals that, after adjusting for differences in age structure between the two populations, Aboriginal and Torres Strait Islander people are 2.5 times as likely to have cited the stress of not being able to get a job; 1.9 times as likely to have reported the death of a family member or friend; 1.7 times as likely to have reported mental illness; and 1.4 times as likely to have said that in the previous year serious illness had been a stressor for them, their family and/or their friends. Similar patterns can be found in studies of the effects of colonisation and dispossession in Canada and the United States (Gone et al. 2019). Criminologists have long known that personal stressors greatly increase the risk of involvement

in crime, particularly when the source of the stress involves an injustice, is highly distressing, and is associated with feelings of powerlessness (Agnew 2001).

Being a member of the stolen generation magnified the trauma resulting from colonisation and dispossession. De Maio et al. (2005) found that being a member of the stolen generation was linked with a doubling of the risk of arrest, a 150 percent increase in the risk of alcohol overuse, a doubling of the risk of experiencing betting and gambling problems, and a 150 percent increase in the risk of contacting the mental health services of Western Australia. These effects were not limited to members of the stolen generation. De Maio et al. (2005) found that the children of caregivers who were forcibly removed from their family were more likely than Aboriginal children whose primary caregiver had not been forcibly removed from their family to experience emotional and behavioural difficulties and to consume alcohol and other drugs at very high levels.

We did not include many other important sources of stress, such as mental illness, overcrowding at home, not being able to get a job, losing a job, being bullied or experiencing harassment or racism. Initial investigation revealed that many of these factors are associated with the risk of arrest, but this association disappeared once we controlled for membership of the stolen generation (self or relatives) and level of psychological distress.

### *Illicit drug and alcohol use*

People exposed to high levels of stress often seek refuge in high levels of illicit drug and alcohol use (Sinha 2008). Data from the 2018–19 National Aboriginal and Torres Strait Islander Health Survey (Australian Bureau of Statistics 2019) reveal that, after adjusting for differences in age structure between the two populations, Aboriginal and Torres Strait Islander people are 3.6 times more likely than non-Indigenous Australians to report alcohol and illicit drug-related problems. High levels of illicit drug and alcohol use have long been known to influence the risk and frequency of involvement in crime. Alcohol consumption increases the risk of violent behaviour among people who are frustrated or angry (Corman & Mocan 2015; Duke et al. 2018; Exum 2006). Psychostimulants (eg cocaine, methamphetamine), if used frequently and over a long period, have a similar effect (McKetin et al. 2020). Dependent users of illicit drugs also often resort to income-generating crime (eg robbery, burglary, illicit drug dealing) to fund their illicit drug consumption (Corman & Mocan 2000; Wish & Johnson 1986).

### *Adverse social environment*

With the best will in the world on the part of their parents, it is difficult for young people to resist the influence of their peers, especially when school is alienating, employment prospects are remote and role models are scarce. As social disorganisation theorists pointed out long ago, crime-prone neighbourhoods tend to remain crime-prone in the face of substantial population turnover (Shaw & McKay 1931, 1942). Children grow up repeating the domestic violence, substance abuse, crime and hostile interactions with police they have witnessed among their older peers and parents. The evidence for this social learning effect is strong. Children exposed to family violence are at elevated risk of becoming violent themselves when they become

adults (Herrenkohl, Jung & Lee 2017). Children whose parents engage in illicit drug and alcohol abuse are at increased risk of substance abuse themselves (Bahr, Hoffman & Yang 2005). Young people whose attachment to parents is broken, weak or absent due to substance abuse or mental health problems are more likely to associate with delinquent peers (McGloin & Thomas 2019; Weatherburn & Lind 2001).

### *Social capital*

Given the prevalence of these risk factors, one might be forgiven for thinking that virtually all Indigenous Australians had been arrested at some point in their lives. In fact, while the proportion of Indigenous Australians who have been arrested is high, the vast majority of Indigenous Australians have never been arrested or prosecuted (Australian Bureau of Statistics 2016; Skrzypiec & Wundersitz 2005; Weatherburn & Ramsey 2018).

One of the factors that limits Indigenous Australians' rate of entry into the criminal justice system is that, despite the legacy of colonisation and dispossession, most Indigenous Australians are 'socially embedded'—that is, strongly attached to a network of family and friends and actively involved in community activities. At the time of the last NATSISS, 43 percent reported having daily contact with family and friends living outside the household; more than 90 percent reported that they were able to get support in a time of crisis; more than 90 percent reported they were involved in sporting, social or community activities; and more than 80 percent reported feeling that they could confide in family and friends (Australian Bureau of Statistics 2016). Control theories in criminology emphasise the protective effect of having strong social ties to institutions, such as one's family, peer group, school or community group (Gottfredson 2003). These attachments engender what Jackson Toby famously referred to as a 'stake in conformity' (Toby 1957). They also help buffer the criminogenic effect of economic stress (Weatherburn & Lind 2001).

### *Education, income and employment*

We would expect lower rates of contact with the criminal justice system among those who are better educated if only because it means access to a wider variety of jobs and a better income. Education, however, arguably does more than this. As with social embeddedness, education greatly increases the opportunity costs of involvement in crime or conflict with police. Chapman et al. (2002), in a study of trends in burglary in New South Wales, found that school completion rates and employment were both negatively associated with crime even after controlling for a wide range of other important factors. Similar results have been obtained in other more recent studies (see, for example, Fergusson, Swain-Campbell & Horwood 2002; Hjalmarsson, Holmlund & Lindquist 2014; Lochner 2020).

Income has a similar protective effect, in part because it increases the potential cost associated with arrest, and in part because it reduces the incentive for involvement in income-generating crimes such as theft, robbery and illicit drug dealing. In his analysis of the relationship between wages and self-reported involvement in income-generating crime using the National Longitudinal Survey of Youth, Grogger (1998) found that, on average, a 10 percent increase in

wages reduces participation in crime by 1.8 percentage points. Similar results have since been obtained by Machin and Meghir (2004). Studies of the relationship between unemployment and crime also highlight the importance of employment in preventing involvement in crime (Altindag 2012; Raphael & Winter-Ebmer 2001; Weatherburn & Schnepel 2016).

## Exposure to arrest

It would be a mistake to assume, however, that the high rate of Indigenous arrest reflects nothing more than a high rate of Indigenous offending. The historical evidence suggests that police are more likely to arrest and detain Indigenous Australians than non-Indigenous Australians who commit similar offences. This is particularly true in relation to so-called public order offences, such as offensive behaviour and offensive language. The Indigenous arrest rate for offensive behaviour, for example, exceeds the non-Indigenous arrest rate for that offence by a factor of 4.5 in New South Wales, 10.1 in Queensland, 10.2 in the Northern Territory and 22.7 in South Australia (Australian Bureau of Statistics 2023b). These considerations and other evidence (see, for example, McNamara et al. 2021) suggest that, other things being equal, rates of Indigenous arrest will be higher among those more exposed to police. Thus, we would expect higher rates of arrest among those who are homeless, who have a mental health problem, or who live in areas regularly patrolled by police. Since the states and territories differ in their criminal laws and in their policing practices and policies, we would also expect the jurisdiction in which a person lives to shape their risk of arrest.

# The current study

Approval to conduct the current study was given by the University of New South Wales Human Research Ethics Committee on 29 June 2022 (application no. HC220348).

To examine the effect of the factors just discussed, it is important to specify the nature of the relationship between them and the risk of arrest. The model we put forward can be succinctly summarised using the following logistic equation:

**Equation 1:**

$$P(A/X_i) = 1 / (1 + e^{-(\alpha + \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + \beta X_5 + \beta X_6 + \beta X_7 + \beta X_8)})$$

where:

- P(A) is the probability of arrest;
- $X_i = (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8)$  and:
  - X1=demographic factors (eg age, gender);
  - X2=lifestyle factors (eg illicit drug/alcohol use);
  - X3=factors associated with stress/trauma;
  - X4=adverse social environment (eg 'bad' neighbourhood);
  - X5=exposure to arrest (eg homelessness, laws, and law enforcement policy);
  - X6=human/economic capital (eg education, income);
  - X7=social capital (eg ties to friends, family, and community);
  - X8=jurisdiction; and
  - $\alpha$ =the probability of arrest when X1 to X6 are zero (ie baseline levels of all categorical variables).

The primary aim of the current study is to assess the adequacy of the model of Indigenous arrest shown in equation 1 above. Our secondary aim is to determine the extent to which the model provides a satisfactory account of the risk of Indigenous imprisonment. This is important because, while 14.5 percent of Indigenous Australians report having been arrested in the five years preceding the 2014–15 NATSISS, only 3.2 percent report having been imprisoned in the five years preceding the survey (see Table 1). The correlates of Indigenous arrest may therefore differ in sign and/or magnitude from those of imprisonment.

To evaluate the model shown in equation 1, we need to find measures of each of these theoretical constructs. As there are no longitudinal surveys of Indigenous contact with Australian state and territory criminal justice systems, our analysis relies on the 2014–15 NATSISS (Australian Bureau of Statistics 2016). The NATSISS is a cross-sectional survey and was not designed as a dataset for use in testing theories about the determinants of Indigenous contact with the criminal justice system. This survey, however, does have two advantages for our purposes. Firstly, many of the variables we would want to measure in a longitudinal survey are included in the NATSISS. Secondly, the survey is unique in that it allows us to compare outcomes in a population of people who have a shared history of colonisation and dispossession but whose life experiences and frequency of contact with the justice system vary greatly. Rigorously formulated theory can sometimes act as a spur to better data collection. With this in mind we offer a tentative test of the theory embodied in equation 1, acknowledging that more thoroughgoing tests will require much better data on the longitudinal patterns of Indigenous contact with the criminal justice system.

## Data source

The 2014–15 NATSISS is a nationally representative stratified multistage survey of Aboriginal and Torres Strait Islanders designed to collect information on a range of demographic, social, environmental and economic characteristics. Further details concerning the survey, sampling strategy, interview methods and response rates can be found in the explanatory notes section of the survey report (Australian Bureau of Statistics 2016).

## Dependent variable

The dependent variables in the study are:

- the probability of having been arrested in the previous five years; and
- the probability of having been imprisoned in the previous five years.

Both were estimated from the weighted proportion of survey respondents responding ‘yes’ to the question, ‘In the last five years have you been arrested by police?’ and/or ‘yes’ to the question, ‘In the last five years have you spent time in jail?’

## Covariates

### *Demographic factors*

Respondents were classified into five age groups: 15–20, 21–30, 31–40, 41–50 and 51+ years. The other demographic factors included in the analysis were sex, coded 0 for women and 1 for men, and whether the respondent resided in a remote or very remote area, coded 1 if yes and 0 otherwise.

### *Lifestyle factors*

Based on research reviewed earlier, the lifestyle factor with the greatest effect on the risk of arrest is substance use. We classified substance use into four categories:

- no illicit drug or alcohol use in the preceding 12 months (coded 1).
- alcohol but not illicit drug use in the preceding 12 months (coded 2).
- illicit drug but not alcohol use in the preceding 12 months (coded 3); and
- both illicit drug and alcohol use in the preceding 12 months (coded 4).

### *Stress and trauma*

The NATSISS asks respondents 25 questions about stressors experienced over the preceding 12 months (eg mental illness, overcrowding at home, not being able to get a job, losing a job, being bullied or harassed, being a witness to violence, experiencing violence or violent crime). Preliminary investigation revealed that most of the individual measures of stress were rendered insignificant in the presence of controls for psychological distress score (Kessler et al. 2002). The single exception was membership of the stolen generation, which remained significant even in the presence of the Kessler score. We opted, therefore, to use the Kessler scale rather than including separate measures for each of the 25 stressors. Responses to the Kessler scale items were grouped into two categories: low/moderate (coded 0) and high/very high (coded 1) and the resulting variable named *Kessler group*.

Two stolen generation measures were employed. The first, *Stolen generation (personal)*, measures whether the respondent had been removed from their family by welfare or the government or taken away to a mission. The second, *Stolen generation (relatives)*, measures whether any of the respondent's relatives had been removed from their family by welfare or the government or taken away to a mission.

### *Social environment*

The NATSISS is fairly limited in the variables that might capture the adverse effects of neighbourhood crime and social disorder. It does ask respondents, however, whether they are aware of any neighbourhood problems. We used this question to measure respondents' exposure to an adverse social environment. We named this variable *Neighbourhood problems* and coded it as 1 if the response was yes and 0 otherwise.

### *Exposure to arrest*

We measured exposure to arrest using responses to the NATSISS question about whether the respondent had ever been homeless. As having a home is a protective factor, we coded this variable (labelled *Permanent home*) as 1 if the respondent had never been homeless and 0 if they had. To capture variations in policing policy, we include *State/territory* as a variable in the model, coded 1 to 8 in the order NSW, Vic, Qld, SA, WA, Tas, NT and ACT.

### *Human/economic capital*

Having a higher human capital endowment was captured using the variable *School completion*, coded 1 if the respondent completed school and 0 otherwise. Respondents were grouped into two categories based on whether their income was in the top four deciles or the bottom six. This variable was labelled *Income* and was coded 1 for those whose income at the time of the interview was in the top four deciles (ie deciles 7–10) and 0 for those whose income was in the first six deciles.

### *Social capital*

Our final construct, social capital, was captured using two NATSISS variables. The first (*Married*) was coded 1 if the respondent reported being married and 0 otherwise. The second (*Number of confidants*) was coded 0 if the respondent reported having fewer than three confidants and 1 if they reported three or more confidants. Table 1 lists each variable included in the study and shows its coding.

Table 1: Variables and their coding		
Variable name	Coding	Interpretation
Sex <sup>a</sup>	1	Male
	0	Female
Age group	1	15–20 years
	2	21–30 years
	3	31–40 years
	4	41–50 years
	5	51+ years
Stolen generation (personal)	1	Yes
	0	No
Stolen generation (relatives)	1	Yes
	0	No
Kessler group (psychological distress)	1	High/very high
	0	Low/moderate
Drug use in last 12 months	1	Yes
	0	No
Alcohol use in last 12 months	1	Yes
	0	No
Permanent home	1	Yes
	0	No
Lives in a remote area	1	Yes
	0	No
Married	1	Yes
	0	No
Number of confidants (three or more)	1	Yes
	0	No
Top four income deciles	1	Yes
	0	No
School completion	1	Yes
	0	No
Arrested in past five years	1	Yes
	0	No
Imprisoned in past five years	1	Yes
	0	No

a: The variable 'sex' in the NATSISS only takes on two values: 'male' and 'female'.

## Analysis

We begin by providing a frequency table of the variables included in the study. We then report the results of fitting a logistic regression model to the data to determine which variables are independently associated with risk of arrest. To illustrate the strength of the relationship between each variable in the model and risk of arrest, we then compute the marginal effects of each covariate holding the other variables constant at their mean value. To illustrate the influence of illicit drug and alcohol use (which, as we see, emerges as one of the strongest dynamic factors), we plot the predicted probability of arrest as a function of age, substance use and alcohol use. To assess the adequacy of the arrest model as a predictor of imprisonment, we regress the risk of imprisonment over the preceding five years against the same factors as were included in the arrest model. We then conduct a series of tests to identify any statistical differences between each parameter in the arrest model and the corresponding parameter in the imprisonment model. All analyses were carried out in Stata v.16.

There is one further step in our analysis to report before turning to the results. It could be argued that our choice of measures for the theoretical constructs invoked in equation 1 is somewhat arbitrary, and that an equally plausible model could have been constructed using an entirely different set of covariates. To test this possibility, we ran a penalised regression on a much larger set of covariates that imposes a penalty on the logistic regression model for having too many variables. This shrinks the coefficients of less important variables towards zero and is known as regularisation. If the model described in equation 1 is broadly correct, we should find LASSO regression generates a model with many of the same covariates that we chose based on our theory of Indigenous arrest. The penalised model we use is LASSO (least absolute shrinkage and selection operator) regression. The regularisation term in LASSO imposes a penalty on the absolute values of the regression coefficients. The penalty encourages sparsity in the model by driving some coefficients to exactly zero, effectively performing variable selection. By shrinking the coefficients of less important variables to zero, LASSO helps to identify the most relevant predictors and reduces the complexity of the model. The strength of the regularisation in LASSO is controlled by a tuning parameter lambda, which determines the amount of shrinkage applied to the coefficients. By adjusting this parameter, one can control the balance between model complexity and predictive power. Due to its ability to perform feature selection, LASSO regression is well suited to our situation, where identifying the most influential predictors is important. Our LASSO model included the following variables:

1. Age (agegroup)
2. Sex (sex)
3. Marital status (maritalstatus)
4. State (STATE)
5. Remoteness (remoteness)
6. Home language (homelanguage)
7. Indigenous language speaker (Indigenous\_speaker)
8. Homelands recognition (homelands\_recognition)
9. Homelands visits (homelands\_visits)

10. Homelands residence (homelands\_residence)
11. Cultural participation in the last 12 months (culturalparticipation\_12)
12. Indigenous English comprehension (Indigenous\_comprehension)
13. Clan identification (clan\_identification)
14. Welfare (on\_welfare)
15. Income (top four deciles)
16. Employment status (employment\_status)
17. Never worked (neverworked)
18. Completed school (schoolcompletion)
19. Homelessness (beenhomeless)
20. Permanent place to live (nopermplacetolive)
21. Frequency of face-to-face contact with family and friends (facetofacecontact)
22. Social engagement (social\_engagement)
23. Reported mental health problem (mentalhealth\_stress12)
24. Psychological distress (Kessler\_gp)
25. Frequency of smoking (dailysmoke)
26. Working home facilities (working\_h\_facilities)
27. Can access services (can\_access\_services)
28. Access to a vehicle (canaccesscaranytime)
29. Support in a crisis (crisissupport)
30. Support (gotsupport, nsourcesupport, strongsupport)
31. Experienced racism in the last 12 months (racist\_treatment12)
32. Strong culture (strongculture)
33. Substance use (substanceuse)
34. Alcohol use (alcoholuse\_12)
35. Drug use (druguse\_12)
36. Risky drinking (ST\_RISKY\_DRINKING)
37. People to confide in (canconfide, numconfide)
38. Neighbourhood problems (neighbourhood\_problems)
39. Stolen generation member (stolen\_generation\_person)
40. Stolen generation family (stolen\_generation\_family)
41. Efficacy (efficacyfandf)
42. Divorce (SFF\_divorce\_stress, S\_divorce\_stress)
43. Violence victim (violencevictim\_12)

We also used a generalisation of the LASSO for doing a group-wise variable selection. This is because all the variables listed above are categorical variables expressed through a set of dummy variables. Excluding an insignificant factor variable is equivalent to deleting a group of dummy variables. Hence the group of dummy variables corresponding to a factor variable must be penalised together. The group-LASSO penalised logistic regression was implemented using R package `gglasso` (Yang & Zou 2015).

# Results

## Sample description

Table 2 provides summary statistics for the variables included in the model. All are well represented, and few variables have missing values. Where data are missing, the proportion missing is comparatively small. The level of disadvantage is severe. More than 20 percent are experiencing high or very high levels of psychological distress, more than 70 percent said they have problems in their neighbourhood, more than 40 percent have at some stage been without a permanent home and only 17 percent have completed school. Around 15 percent report having been arrested over the preceding five years.

<b>Table 2: Sample characteristics</b>				
<b>Variable</b>	<b>Frequency (n)</b>	<b>Weighted %</b>	<b>Missing (n)</b>	<b>Missing (%)</b>
<b>Arrested in last five years</b>				
No	5,981	85.47		
Yes	1,036	14.53		
<b>Imprisoned in last five years</b>				
No	6,775	96.85		
Yes	237	3.15		
<b>Sex</b>				
Female	6,049	50.97		
Male	5,129	49.03		
<b>Age group</b>				
15–20	906	13.31		
21–30	1,501	15.68		
31–40	1,351	11.45		
41–50	1,267	10.63		
51+	6,153	48.92		
<b>Substance use in last 12 months</b>				
No alcohol or drug use	1,592	22.69		
Alcohol but not drug use	2,964	46.76		
Drug but not alcohol use	287	4.75		
Alcohol and drug use	1,499	25.43		

<b>Table 2: Sample characteristics (cont.)</b>				
<b>Variable</b>	<b>Frequency (n)</b>	<b>Weighted %</b>	<b>Missing (n)</b>	<b>Missing (%)</b>
<b>Kessler group (psychological distress)</b>			67	0.60
Low/moderate	4,622	78.73		
High/very high	2,333	21.27		
<b>Stolen generation (personal)</b>			197	1.76
Yes	729	9.83		
No	6,096	90.17		
<b>Stolen generation (relatives)</b>			197	1.76
Yes	2,894	47.33		
No	3,278	52.67		
<b>Neighbourhood problems</b>			184	1.65
No	1,632	29.15		
Yes	5,206	70.85		
<b>Permanent home</b>				
Yes	2,971	41.28		
No	4,051	58.72		
<b>Lives in a remote area</b>				
No	7,190	79.06		
Yes	3,988	20.94		
<b>Marital status</b>				
Married	3,127	58.17		
Not married	3,895	41.83		
<b>Number of confidants</b>				
Fewer than three	3,652	55.53		
Three or more	3,370	44.47		
<b>School completion</b>				
No	5,391	83.37		
Yes	1,631	16.63		
<b>Income</b>			526	4.71
Decile 6 and below	4,245	64.98		
Decile 7 and above	2,251	35.02		
<b>State or territory</b>				
New South Wales	1,683	31.19		
Victoria	1,197	7.27		
Queensland	1,969	28.68		
South Australia	1,080	5.55		
Western Australia	1,694	12.74		
Tasmania	1,198	3.75		
Northern Territory	1,947	9.91		
Australian Capital Territory	410	0.91		

Table 3 shows the bivariate relationship between each of the factors and the proportion of Indigenous Australians arrested over the five years preceding the survey. All the bivariate relationships are statistically significant. Arrest proportions are higher for males, younger respondents and those who report using alcohol, illicit drugs or both. They are also higher for those with high or very high scores on the Kessler scale, those who are members of the stolen generation or whose relatives are, those who are homeless or live in remote areas, those with fewer confidants, those who did not complete school and those with incomes below decile 7. The proportion arrested in the five years preceding the survey varies markedly across the states and territories, being highest in Western Australia (20.5%) and lowest in Tasmania (9.9%). The only anomalous finding is that a higher proportion of those who are married had been arrested over the five years preceding the survey than those who are unmarried (16.2% vs 12.9%). This may be an artefact of age.

<b>Table 3: Bivariate correlates of Indigenous arrest</b>			
	Arrested in the past five years?		<i>p</i> -value
	No (%)	Yes (%)	
<b>Sex</b>			<0.001
Female	90.06	9.94	
Male	78.78	21.22	
<b>Age group</b>			<0.001
15–20	87.09	12.91	
21–30	79.15	20.85	
31–40	80.09	19.91	
41–50	83.11	16.89	
51+	93.83	6.17	
<b>Substance use in last 12 months</b>			<0.001
No alcohol or drug use	93.08	6.92	
Alcohol but not drug use	88.19	11.81	
Drug but not alcohol use	79.44	20.56	
Alcohol and drug use	71.85	28.15	
<b>Kessler group (psychological distress)</b>			<0.001
Low/moderate	88.07	11.93	
High/very high	79.59	20.41	
<b>Stolen generation (personal)</b>			<0.001
No	86.23	13.77	
Yes	77.64	22.36	
<b>Stolen generation (relatives)</b>			<0.001
No	87.58	12.42	
Yes	82.47	17.53	

<b>Table 3: Bivariate correlates of Indigenous arrest (cont.)</b>			
	<b>Arrested in the past five years?</b>		<b>p-value</b>
	<b>No (%)</b>	<b>Yes (%)</b>	
<b>Neighbourhood problems</b>			<0.001
No	88.65	11.35	
Yes	84.18	15.82	
<b>Permanent home</b>			<0.001
Yes	79.36	20.64	
No	89.55	10.45	
<b>Lives in a remote area</b>			<0.001
Yes	81.43	18.57	
No	87.36	12.64	
<b>Marital status</b>			<0.001
Married	83.76	16.24	
Not married	87.07	12.93	
<b>Number of confidants</b>			<0.001
Fewer than three	82.43	17.57	
Three or more	88.28	11.72	
<b>School completion</b>			<0.001
No	83.44	16.56	
Yes	91.17	8.83	
<b>Income</b>			<0.001
Decile 6 and below	82.70	17.30	
Decile 7 and above	89.51	10.49	
<b>State or territory</b>			<0.001
New South Wales	88.44	11.56	
Victoria	86.06	13.94	
Queensland	86.35	13.65	
South Australia	82.57	17.43	
Western Australia	79.49	20.51	
Tasmania	90.09	9.91	
Northern Territory	83.40	16.60	
Australian Capital Territory	88.21	11.79	

## Arrest model

Table 4 shows the results of the logistic regression analysis for arrest. Model adequacy can be assessed by using the area under the curve (AUC) statistic, which ranges between 0.5 (no predictive power) to 1.0 (perfect prediction). The AUC statistic for the model in Table 4 is 0.804, which on the Hosmer–Lemeshow criteria (Hosmer, Lemeshow & Sturdivant 2013) is an excellent level of discrimination. An odds ratio greater than one indicates a person with that characteristic is more likely to have been arrested. An odds ratio of less than one indicates that a person with that characteristic is less likely to have been arrested.

Table 4: Logistic regression model of arrest				
Arrested in last five years	Odds ratio	p-value	Lower 95% CI	Upper 95% CI
<b>Male</b>	3.069	<0.001	2.565	3.672
<b>Age group (vs 15–20)</b>				
21–30	2.149	<0.001	1.581	2.921
31–40	1.893	<0.001	1.375	2.606
41–50	1.403	0.041	1.014	1.941
51+	0.456	<0.001	0.323	0.644
<b>Substance use in last 12 months (vs no alcohol or drug use)</b>				
Alcohol but not drug use	1.813	<0.001	1.392	2.363
Drug but not alcohol use	2.282	<0.001	1.497	3.478
Alcohol and drug use	3.739	<0.001	2.835	4.930
<b>Kessler group (high/very high)</b>	1.529	<0.001	1.276	1.832
<b>Stolen generation (personal)</b>	1.427	0.009	1.093	1.863
<b>Stolen generation (relatives)</b>	1.273	0.016	1.046	1.548
<b>Neighbourhood problems</b>	1.366	0.008	1.086	1.718
<b>Permanent home</b>	0.563	<0.001	0.468	0.677
<b>Lives in a remote area</b>	0.587	<0.001	0.470	0.734
<b>Married</b>	0.755	0.002	0.630	0.905
<b>Number of confidants (three or more)</b>	0.708	<0.001	0.590	0.850
<b>Completed school</b>	0.469	<0.001	0.370	0.595
<b>Income in top four deciles</b>	0.489	<0.001	0.400	0.599
<b>State or territory (vs New South Wales)</b>				
Victoria	1.167	<0.001	0.696	1.492
Queensland	1.215	<0.001	0.802	1.561
South Australia	1.469	<0.001	0.943	1.977
Western Australia	1.358	<0.001	1.111	2.159
Tasmania	1.076	0.042	0.685	1.475
Northern Territory	1.337	<0.001	0.888	1.775
Australian Capital Territory	1.319	<0.001	0.661	2.001
<b>Constant</b>	0.070	0.000	0.037	0.105

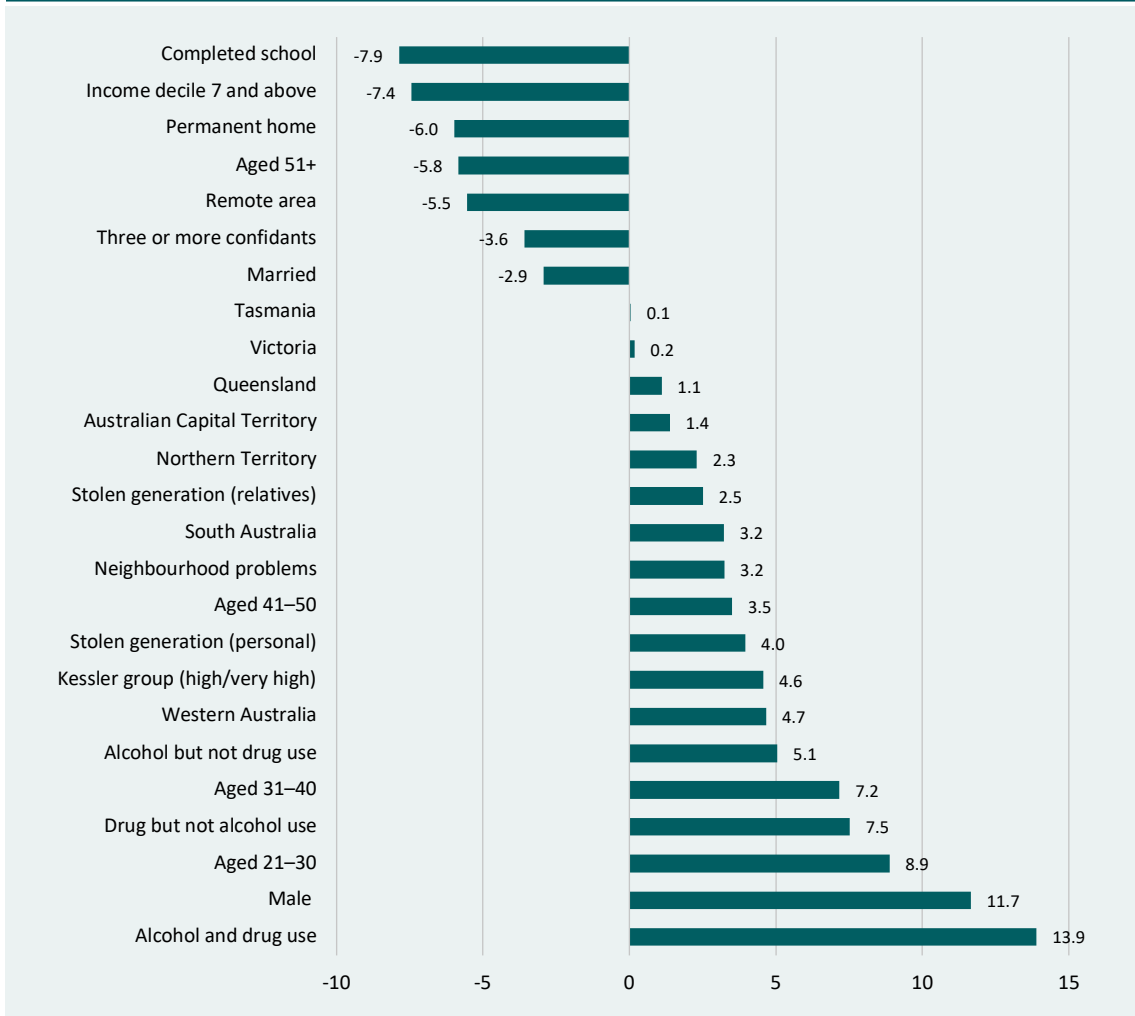
Note: AUC=0.804

All the covariates are significant, and all have the expected effect. The narrow confidence intervals indicate that the effects are precisely estimated. After adjusting for other variables in the model, the odds of arrest for males are more than 3.3 times higher than for females. The odds of arrest peak at age 21–30, before declining with age. By age 51+, the odds of arrest fall below those in the reference age group: 15–20.

The strongest risk factor is illicit drug and alcohol use. The odds of arrest for those who have used both illicit drugs and alcohol in the last 12 months are more than 3.74 times higher than for someone who has used neither illicit drugs nor alcohol in the previous 12 months. Strong effects can also be seen for psychological distress (odds ratio: 1.53), being a member of the stolen generation (odds ratio: 1.43) and having relatives who are members of the stolen generation (odds ratio: 1.27). The odds of arrest are higher for those who have neighbourhood problems (odds ratio: 1.4) and, somewhat surprisingly, for those who live in any state or territory other than New South Wales. The strongest protective effect is that associated with completing school (odds ratio: 0.47); however, the odds of arrest are also substantially lower for those who have never been without a home (0.56), those whose earnings place them in the top four deciles (0.49) and those who live in a remote area (0.59).

Odds ratios cannot be directly interpreted as relative risks. To provide a more intuitive picture of the main results, we calculated the marginal effects of key factors on the predicted probability of arrest. To calculate the marginal effect of a factor, say sex, we first used the model to estimate the probability of arrest for each person on the assumption that everyone is female (all other covariates being held at their actual values). We then estimated the risk of arrest for each person on the assumption that everyone is male (all other covariates being held at their actual values). This gives us two predicted risks of arrest for each person in our sample. The marginal effect of sex is the average of these differences.

**Figure 1: Marginal effects of all covariates on risk of arrest (percentage points)**



Note: Base risk of arrest=14.9

The four strongest influences on risk of arrest are:

- alcohol and illicit drug use in the previous 12 months (which increases the risk of arrest by 13.9 percentage points, or 48%);
- illicit drug (but not alcohol) use over the previous 12 months (which increases the risk of arrest by 7.5 percentage points, or 36%);
- alcohol (but not illicit drug) use over the previous 12 months (which increases the risk of arrest by 5.1 percentage points, or 33%); and
- having a high or very high level of psychological distress (which increases the risk of arrest by 4.6 percentage points, or 24%).

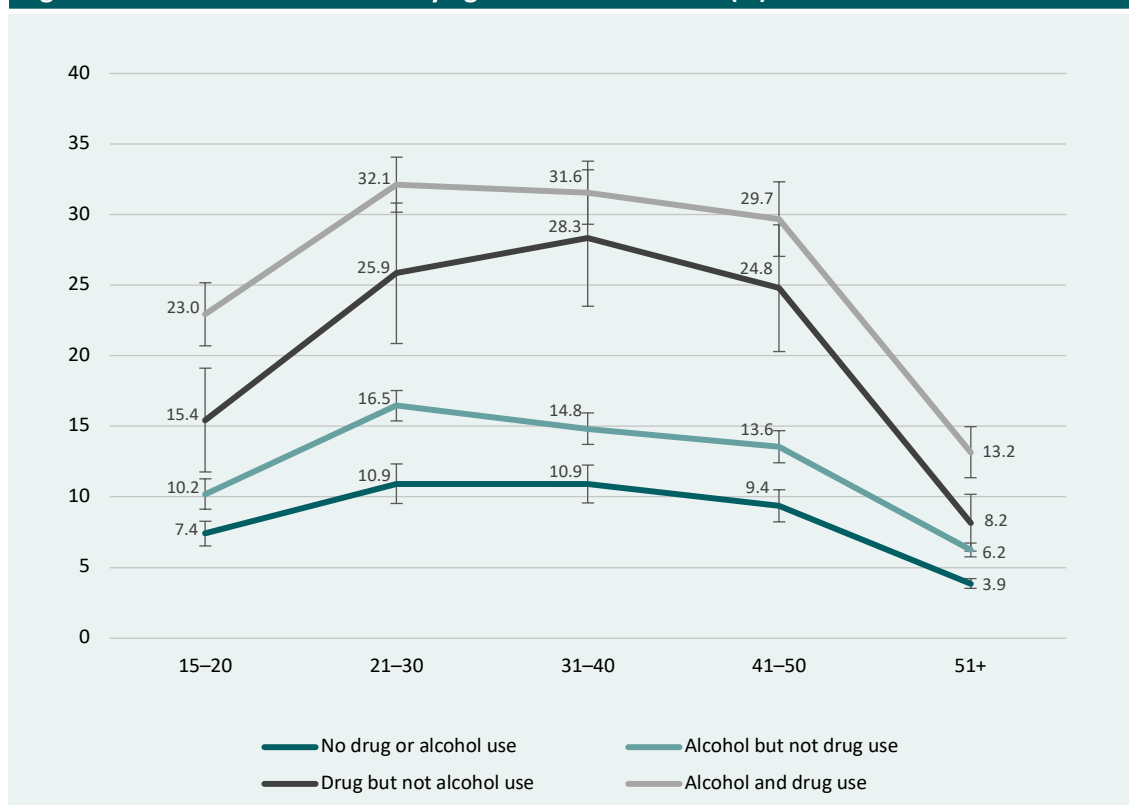
Those in younger age groups are, not surprisingly, more at risk of arrest than those in older age groups. Living in Western Australia is associated with a 4.7 percentage point increase in the risk of arrest, a result comparable in magnitude to having a high or very high level of psychological distress. The remaining risk factors make statistically significant but much smaller contributions to the risk of arrest.

Turning to the protective factors, compared to the average respondent, completing school reduces the risk of arrest by 7.9 percentage points (or 53%). Four other strongly protective factors are:

- having an income in the top four deciles (which reduces the risk of arrest by 7.4 percentage points, or 50%);
- having a permanent home (which reduces the risk of arrest by 6.0 percentage points, or 40.2%);
- being aged 51+ (which reduces the risk by 5.8 percentage points, or 39%); and
- living in a remote area (which reduces the risk of arrest by 5.5 percentage points or 37%).

In a logistic regression model, however, the effect of any given factor depends on the value of other factors in the model. To illustrate this, we now present three figures showing the impact on the risk of arrest of substance use by age of respondent (Figure 2), substance use by level of psychological distress (Figure 3) and age by membership of the stolen generation (Figure 4). These predictions were obtained by using the model to compute the predicted probability of arrest for different combinations of respondent characteristics.

**Figure 2: Predicted risk of arrest by age and substance use (%)**



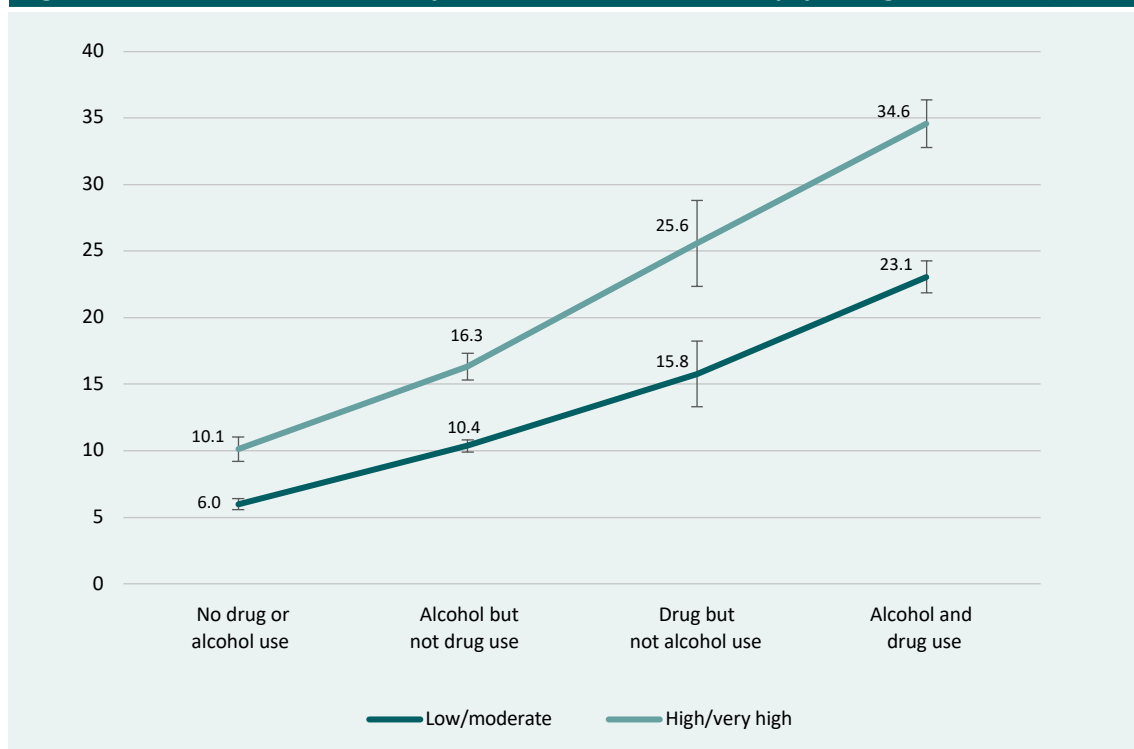
Note: Includes 95% confidence intervals

Figure 2 reveals that, regardless of substance use, the risk of arrest rises sharply from age 15–20, peaks at 21–30 (or 31–40 for those using illicit drugs but not alcohol) and then declines.

The decline is particularly steep after age 50. This pattern is consistent with the findings of most studies of age and arrest, although among non-Indigenous groups the decline is usually steeper (Ulmer & Steffensmeier 2014). The more important point is the influence of substance use on the risk of arrest. An estimated 11 percent of Indigenous Australians aged 21–30 who do not use illicit drugs or alcohol have been arrested in the preceding five years. This rises to 16.5 percent of those who use alcohol but not illicit drugs, 25.9 percent of those who use illicit drugs but not alcohol and 32.1 percent of those who use both. The differences between these substance use groups change very little between ages 21–30 and 41–50.

Figure 3 contrasts the effect of substance use on risk of arrest for those who score low to moderate on the Kessler Psychological Distress Scale (lower curve) with those who score high or very high (upper curve). The risk of arrest increases for both groups as we move from those who use neither alcohol nor illicit drugs to those who use both alcohol and illicit drugs. Regardless of substance use pattern, however, those who score high or very high on the Kessler scale are more at risk of arrest than those who score low to moderate. The gap between the two groups increases as we move from those who use neither alcohol nor illicit drugs to those who use both. Among those who use neither illicit drugs nor alcohol, there is a four percentage point gap in arrest risk between those who are low to moderate and those who are high to very high on the Kessler scale. In the case of those who use both drugs and alcohol, the gap is 11 percentage points.

**Figure 3: Predicted risk of arrest by substance use and level of psychological distress (%)**



Note: Includes 95% confidence intervals

Figure 4 shows the effect on risk of arrest of being a member of the stolen generation, broken down by age. Among those who are not members of the stolen generation, the arrest risk peaks in the 21–30-year age group at 19.6 percent. Among those who are members of the stolen generation, the arrest risk peaks in the same age group, at 34.3 percent. In fact, regardless of age, those who are members of the stolen generation are more at risk of arrest than those who are not.

**Figure 4: Predicted risk of arrest by age and membership of the stolen generation (%)**



Note: Includes 95% confidence intervals

## Imprisonment model

We now consider how well the model just presented explains variation in the likelihood of imprisonment. Since being arrested is, for all practical purposes, a precondition of being imprisoned, we would expect a fair degree of overlap in the factors associated with each. The primary question of interest, therefore, is not whether the variables that predict arrest also predict imprisonment but whether the models differ in the magnitude of the coefficients measuring the strength of each factor. Table 5 shows the bivariate relationship between each of our explanatory factors and the proportion of respondents who had been imprisoned in the previous five years.

<b>Table 5: Bivariate correlates of Indigenous imprisonment</b>			
	<b>Imprisoned in the last five years?</b>		<b>p-value</b>
	<b>No (%)</b>	<b>Yes (%)</b>	
<b>Sex</b>			<0.001
Female	98.58	1.42	
Male	93.80	6.20	
<b>Age group</b>			<0.001
15–20	97.91	2.09	
21–30	95.05	4.95	
31–40	94.29	5.71	
41–50	95.50	4.50	
51+	99.22	0.78	
<b>Substance use in last 12 months</b>			<0.001
No alcohol or drug use	98.32	1.68	
Alcohol but not drug use	97.58	2.42	
Drug but not alcohol use	93.68	6.32	
Alcohol and drug use	93.13	6.87	
<b>Kessler group (psychological distress)</b>			<0.001
Low/moderate	97.09	2.91	
High/very high	95.50	4.50	
<b>Stolen generation (personal)</b>			<0.001
No	96.87	3.13	
Yes	93.96	6.04	
<b>Stolen generation (relatives)</b>			0.03
No	97.05	2.95	
Yes	96.00	4.00	
<b>Neighbourhood problems</b>			<0.001
No	97.39	2.61	
Yes	96.28	3.72	0.04
<b>Permanent home</b>			<0.001
Yes	95.33	4.67	
No	97.41	2.59	
<b>Lives in a remote area</b>			<0.001
Yes	94.69	5.31	
No	97.63	2.37	
<b>Marital status</b>			0.30
Married	96.33	3.67	
Not married	96.80	3.20	

<b>Table 5: Bivariate correlates of Indigenous imprisonment (cont.)</b>			
	<b>Imprisoned in the last five years?</b>		<b>p-value</b>
	<b>No (%)</b>	<b>Yes (%)</b>	
<b>Number of confidants</b>			<0.001
Fewer than three	95.47	4.53	
Three or more	97.74	2.26	
<b>School completion</b>			<0.001
No	95.89	4.11	
Yes	98.80	1.20	
<b>Income</b>			<0.001
Decile 6 and below	95.23	4.77	
Decile 7 and above	98.77	1.23	
<b>State or territory</b>			<0.001
New South Wales	98.27	1.73	
Victoria	98.51	1.49	
Queensland	97.36	2.64	
South Australia	95.86	4.14	
Western Australia	94.16	5.84	
Tasmania	98.30	1.70	
Northern Territory	94.21	5.79	
Australian Capital Territory	96.62	3.38	

All the relationships except that associated with marital status are statistically significant and all point in the same direction as the bivariate relationships shown in Table 3 for risk of arrest. All are therefore included in the logistic regression model for imprisonment, shown in Table 6.

<b>Table 6: Logistic regression model of imprisonment</b>				
<b>Imprisoned in last five years</b>	<b>Odds ratio</b>	<b>p-value</b>	<b>Lower 95% CI</b>	<b>Upper 95% CI</b>
<b>Male</b>	5.221	<0.001	3.574	7.627
<b>Age group (vs 15–20)</b>				
21–30	3.613	<0.001	1.826	7.151
31–40	4.189	<0.001	2.109	8.321
41–50	2.701	0.005	1.345	5.423
51+	0.485	0.093	0.209	1.128
<b>Substance use in last 12 months (vs no alcohol or drug use)</b>				
Alcohol but not drug use	1.665	0.061	0.976	2.838
Drug but not alcohol use	2.794	0.006	1.333	5.855
Alcohol and drug use	3.300	<0.001	1.934	5.629
<b>Kessler group (high/very high)</b>	1.008	0.963	0.712	1.428
<b>Stolen generation (personal)</b>	1.854	0.011	1.154	2.977
<b>Stolen generation (relatives)</b>	1.301	0.188	0.879	1.926
<b>Neighbourhood problems</b>	1.505	0.080	0.952	2.381
<b>Permanent home</b>	0.672	0.029	0.470	0.959
<b>Lives in a remote area</b>	0.692	0.088	0.453	1.057
<b>Married</b>	0.764	0.124	0.543	1.077
<b>Number of confidants (three or more)</b>	0.702	0.058	0.488	1.012
<b>Completed school</b>	0.289	<0.001	0.156	0.535
<b>Top four income deciles</b>	0.209	<0.001	0.128	0.341
<b>State or territory (vs New South Wales)</b>				
Victoria	0.487	0.171	0.174	1.365
Queensland	1.457	0.319	0.694	3.058
South Australia	1.545	0.292	0.688	3.472
Western Australia	2.719	0.005	1.345	5.494
Tasmania	1.006	0.990	0.413	2.449
Northern Territory	3.007	0.002	1.480	6.110
Australian Capital Territory	1.341	0.665	0.355	5.072
<b>Constant</b>	0.003	<0.001	0.001	0.010

Note: AUC=0.885

With an AUC of 0.885, the fit of the imprisonment model to the data can be regarded as excellent. A comparison of Table 4 and Table 6 reveals, as expected, a fair degree of similarity in the direction and magnitude of the coefficients for the arrest and imprisonment models. To test this, however, we carried out a series of tests for significant differences between the model covariates. These are explored in Table 7, which shows the  $\chi^2$  and *p*-value results of tests for differences between corresponding covariates in each of the two models.

<b>Table 7: Chi-square tests for model coefficient differences</b>				
	<b>Arrest (OR)</b>	<b>Imprisonment (OR)</b>	<b><math>\chi^2</math></b>	<b>p-value</b>
<b>Male</b>	3.069	5.221	7.580	<0.001
<b>Age group (vs 15–20)</b>				
21–30	2.149	3.613	0.530	0.469
31–40	1.893	4.189	1.220	0.269
41–50	1.403	2.701	0.870	0.350
51+	0.456	0.485	0.010	0.927
<b>Substance use in last 12 months (vs no alcohol or drug use)</b>				
Alcohol but not drug use	1.813	1.665	0.110	0.745
Drug but not alcohol use	2.282	2.794	0.290	0.591
Alcohol and drug use	3.739	3.300	0.210	0.646
<b>Kessler group (high/very high)</b>	1.529	1.008	5.530	0.019
<b>Stolen generation (personal)</b>	1.427	1.854	1.140	0.286
<b>Stolen generation (relatives)</b>	1.273	1.301	0.010	0.912
<b>Neighbourhood problems</b>	1.366	1.505	0.180	0.668
<b>Permanent home</b>	0.563	0.672	0.970	0.325
<b>Lives in a remote area</b>	0.587	0.692	0.630	0.426
<b>Married</b>	0.755	0.764	<0.001	0.945
<b>Number of confidants (three or more)</b>	0.708	0.702	<0.001	0.965
<b>Completed school</b>	0.469	0.289	2.350	0.125
<b>Top four income deciles</b>	0.489	0.209	10.630	0.001
<b>State or territory (vs New South Wales)</b>				
Victoria	1.167	0.487	1.950	0.162
Queensland	1.215	1.457	0.490	0.483
Western Australia	1.358	2.719	2.270	0.132
South Australia	1.469	1.545	0.090	0.764
Western Australia	1.358	2.719	2.270	0.132
Tasmania	1.076	1.006	<0.001	0.999
Northern Territory	1.337	3.007	5.700	0.017
Australian Capital Territory	1.319	1.341	0.050	0.820

The only parameters that differ significantly between the two models are:

- sex (being male has a larger effect on the risk of imprisonment than on the risk of arrest);
- Kessler group (having a high or very high level of psychological distress has a more powerful effect on the risk of arrest than on the risk of imprisonment);
- income (having an income in the top four deciles has a larger effect on the risk of arrest than imprisonment); and
- residing in the Northern Territory (which has a larger effect on the risk of imprisonment than on the risk of arrest).

## LASSO regression results

The LASSO results are included in the *Appendix*. In brief, the group-LASSO penalised logistic regression for arrest shrank the coefficients of the following variables to zero: home language, Indigenous speaker, homelands recognition, homeland visits, clan identification, income, can confide, crisis support, got support, strong support, social engagement, strong culture, mental health stress, divorce stress and substance use. The results of the final logistic regression analysis, after removing the insignificant variables, are shown in Table A1 in the *Appendix*. Consistent with our main analysis, we find a significant relationship between risk of arrest and sex, age group, alcohol and drug use, Kessler group, ever being homeless, having three or more confidants and school completion. Other predictors—including neighbourhood problems, being married, living in a particular state, being a member of the stolen generation and having relatives who are members of the stolen generation—are no longer statistically significant.

Because a much larger set of covariates was used in the group-LASSO logistic regression model, we identified a small number of additional risk and protective factors for arrest. Having no Indigenous comprehension (odds ratio: 0.716) and being able to access a motor vehicle whenever needed (odds ratio: 0.7) are associated with a decreased risk of arrest. The odds of arrest are significantly higher for those on welfare, those who had experienced racism in the last 12 months, those who had been victims of violence in the last 12 months and those who smoke daily.

# Discussion

We set out in this report to test a theory that linked the risk of Indigenous arrest to age and gender, illicit drug and alcohol use, stress and trauma, environmental factors associated with a person's neighbourhood, state laws and regulations, exposure to police, and human, economic and social capital. Broadly speaking, our findings are consistent with that hypothesis.

As in almost all studies of arrest, the risk of arrest is higher for males than females, rises to a peak around 21–30 years, and declines rapidly thereafter. Illicit drug and alcohol use increases the risk of arrest, as does mental illness, being a member of the stolen generation, living in a problem affected neighbourhood and having a higher level of exposure to police. These factors are attenuated among Indigenous Australians who are married, who have never been homeless, who have people they feel they can confide in, who have completed school, and who have an income in the top four deciles. Even after controlling for these factors, however, the risk of Indigenous arrest varies markedly across the Australian states and territories, being lowest in New South Wales and highest in South Australia and Western Australia. The fact that the risk of arrest varies significantly across the states and territories, even after controlling for key demographic, social and economic factors, is consistent with the influence of criminal law and law enforcement policy on the risk of Indigenous arrest.

As in past studies, illicit drug and alcohol use emerged as having the strongest relationship with the risk of arrest. Indigenous Australians between the ages of 15 and 50 who consume alcohol and illicit drugs are almost three times more likely to have been arrested in the past five years than those who use neither alcohol nor illicit drugs. This is not a case of big changes in risk arising from a small base. More than one in 10 of those who do *not* use illicit drugs or alcohol had been arrested at least once in the past five years, compared with almost a third of those who use illicit drugs and alcohol. The fact that this difference in risk persists over such a long period (35 years), even after controlling for a wide range of other factors, underscores just how large a contribution illicit drug and alcohol use makes to the volume of Indigenous arrests and, therewith, to Indigenous imprisonment.

Stress and trauma are the second most important independent risk factors for arrest, but they interact with other factors. Having a high or very high level of psychological distress is associated with a 4.6 percentage point (in relative terms, 24%) increase in the risk of arrest. Being a member of the stolen generation is associated with a four percentage point (in relative terms, 18%) increase in the risk of arrest. These effects are independent of each other.

The likelihood of having been arrested for someone who is 21 to 30 years of age but who is not a member of the stolen generation is around 20 percent. For someone the same age who is a member of the stolen generation, the risk rises to 34 percent. The likelihood of having been arrested in the last five years for someone who does not consume illicit drugs or alcohol and who has a low or moderate level of psychological distress is around six percent. If they consume illicit drugs and alcohol but still have only a low or moderate level of psychological distress, the likelihood of having been arrested over the last five years rises to 23 percent. The fact that there are non-linear effects is to be expected given the form of analysis used (logistic regression). What stands out here is the sensitive dependence of each factor on the values of other factors in the model. Put simply, small changes in risk factors can exert very large changes in the risk of arrest.

The two strongest protective factors are completing school, which was associated with a 7.9 percentage point (or 35%) reduction in the risk of arrest, and having an income in the top four deciles, which was associated with a 7.4 percentage point (or 33%) reduction in risk. These effects are independent of those associated with other factors included in the regression model. It would be a mistake to assume, however, that educational and income outcomes can be improved for Indigenous Australians without changes in a young person's family, educational and social environment. The chances of earning an above median income are obviously smaller for those who encounter discrimination in the workplace (Biddle et al. 2013), those who live in areas where labour demand is weak (Hunter 2004), and especially those who leave school early (Gray, Hunter & Lohar 2012). The chances of a child completing school are small if they lack basic social skills, if they suffer from poor health, if they attend a school whose curriculum does not attract their interest, or if their home environment is not conducive to learning and study (Weatherburn 2014). Reducing the risk of arrest by improving Indigenous school completion and income clearly requires a concerted effort to address the sources of Indigenous disadvantage in the home, school and labour market.

Given the literature we reviewed earlier about the importance of social embeddedness in reducing the risk of involvement in crime, it is unsurprising to find that being married reduces the risk of arrest, as does having a dense social network (as measured by close friends you can confide in). Of course, being embedded in a dense *antisocial* network would be expected to increase the risk of arrest. The fact that we do not see this in our measures of embeddedness may be because the variable 'neighbourhood problems' captures some of the antisocial effect. The benefits associated with living in a remote area and having a permanent home are interesting, given that these variables have received little research attention in the literature on Indigenous arrest. Both are strong protective factors. If, as we assume, they measure reduced exposure to police, they suggest that simply being visible to police increases the risk of Indigenous arrest, even if no serious offence is committed. This conclusion is consistent with evidence that police make less use of diversionary alternatives when dealing with minor offences (eg offensive language, offensive behaviour) committed by Indigenous Australians than when dealing with similar offences by non-Indigenous Australians (see, for example, Allard et al. 2010; Cunneen 2001; Weatherburn & Thomas 2023).

Finally, even after controlling for sex, age, substance use, psychological distress, membership of the stolen generation, neighbourhood problems, homelessness, remoteness, marital status, social embeddedness, school completion and income, there are marked differences between the states and territories in the likelihood of arrest (see Table 4). The odds of arrest in South Australia, for example, are 37 percent higher than in Tasmania. Some of this variation is likely attributable to differences between the states and territories in Indigenous rates of offending. The Indigenous arrest rate for robbery, for example, ranges between 136.6 per 100,000 in New South Wales to 273.1 per 100,000 population in the Northern Territory. New South Wales has an Indigenous arrest rate for homicide and related offences twice that of South Australia (Australian Bureau of Statistics 2023b). Some of the inter-jurisdictional variation in Indigenous arrest rates, however, is likely due to differences between the states and territories in the laws they pass and the way they go about enforcing them. As noted earlier, there are marked differences between jurisdictions in the rate at which they arrest Indigenous Australians for public order offences. Indigenous exposure to arrest is not just a function of their visibility to police. It is also a function of the law-and-order policies adopted by state and territory governments and the way police choose to enforce those policies.

The LASSO regression broadly confirms the relevance of our chosen measures as strong correlates of arrest. It did, however, identify several correlates not included in our model. It found having no Indigenous language comprehension and being able to access a motor vehicle whenever needed were protective. Higher risks of arrest were found for those on welfare, those who had experienced racist treatment in the last 12 months, those who reported having been a victim of violence in the last 12 months and those who smoke daily. We can only speculate on the reasons for these correlations. Not being able to understand an Indigenous language may be acting as a proxy for living in an urban area, which we found to be protective. Having access to a motor vehicle may reduce the risk of arrest because it signals a higher income or because it allows a person to escape from potential conflict. The welfare effect is consistent with our findings on income. Experiencing racism would be expected to increase the risk of arrest if it is an additional source of stress, but this finding may also reflect a view about police attitudes formed in the wake of having been arrested. Being a victim of violence may be a sign of family conflict, which on past occasions led to the respondent being arrested. A respondent being a daily smoker is unlikely to have any direct effect on the risk of arrest. It may, however, be strongly associated with the use of illegal substances or alcohol, both of which increase the risk of arrest.

The observations just made above are, of course, based on a cross-sectional survey and must therefore be regarded as tentative. Some of the factors strongly correlated with the risk of arrest may simply be acting as proxies for other unmeasured factors. It is entirely possible, even likely, that the causal relationships we have postulated are more complex than indicated in equation 1. We have, for example, argued that psychological distress increases the risk of arrest. The reverse is also likely—that the experience of being arrested increases psychological distress. We have also argued that failure to complete school increases the risk of arrest. Having been arrested or placed in detention as a juvenile, however, probably lowers the prospects of school completion. Even where we correctly identify some elements in the chain

of causes leading to arrest, we are bound to be missing other key links in the causal chain. It is reasonable to suppose that illicit drug use increases the risk of arrest, but in the present case we do not know whether this is because users are being arrested for drug use and possession, because they are engaging in income-generating property crime to fund their purchases of illicit drugs, or because the drugs being used have a direct effect on their behaviour.

These examples could be multiplied, and they raise an important question. What do we gain by formulating a theory that we cannot rigorously test with the available data? Our response is threefold. First, in 2020, all Australian governments committed themselves to reducing imprisonment of Indigenous young people by 15 percent and imprisonment of Indigenous adults by 30 percent by 2030 (Joint Council on Closing the Gap 2020). Without a better understanding of the factors bringing Indigenous Australians into contact with the criminal justice system, those goals are unlikely to be achieved. We cannot reach that understanding without an attempt, however tentative and uncertain, to move beyond atheoretical analyses of the correlates of Indigenous arrest. As the saying goes, theories are like nets: only he who casts will catch.

Second, we hope that the research reported here will stimulate interest in developing datasets that make it easier to test causal hypotheses concerning Indigenous contact with the criminal justice system. Third, although some of our findings are conjectural, others are entirely consistent with findings from rigorous studies of factors that increase the risk of involvement in crime. Research on illicit drug and alcohol use (Carpenter & Dobkin 2011; Entorf & Winker 2008; Wish & Johnson 1986), school completion (Lochner 2020), employment (Raphael & Winter-Ebmer 2001) and income (Grogger 1998; Weatherburn & Schnepel 2016) are just four examples. There is no need to wait for further research before developing policies to improve outcomes on these dimensions. Progress on them is essential if we are to achieve any long-term reduction in the scale of Indigenous over-representation in prison.

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# Appendix: LASSO analysis results

<b>Table A1: LASSO model of arrest</b>				
<b>Arrested in last five years</b>	<b>Odds ratio</b>	<b>p-value</b>	<b>Lower 95% CI</b>	<b>Upper 95% CI</b>
<b>Male</b>	3.461	<0.001	2.853	4.198
<b>Age group (vs 15–20)</b>				
21–30	1.733	0.001	1.248	2.407
31–40	1.576	0.009	1.122	2.215
41–50	1.190	0.334	0.836	1.695
51+	0.455	<0.001	0.312	0.664
<b>Substance use in last 12 months (vs no alcohol or drug use)</b>				
Alcohol use	1.327	0.027	1.032	1.706
Drug use	1.510	<0.001	1.243	1.834
Risky drinking exceeding guidelines	1.389	<0.001	1.127	1.712
<b>Kessler group (high/very high)</b>	1.300	0.007	1.073	1.574
<b>Stolen generation (personal)</b>	1.313	0.056	0.994	1.735
<b>Stolen generation (relatives)</b>	1.209	0.074	0.982	1.487
<b>Permanent home</b>	1.530	<0.001	1.254	1.865
<b>Lives in a remote area</b>	0.686	0.001	0.549	0.858
<b>Number of confidants (three or more)</b>	0.787	0.014	0.651	0.952
<b>Completed school</b>	0.615	<0.001	0.480	0.789
<b>Top four income deciles</b>	0.512	<0.001	0.367	0.715
<b>Indigenous English comprehension (reference group)</b>				
Comprehends a little	0.990	0.934	0.779	1.258
No comprehension	0.716	0.016	0.546	0.939
<b>On welfare</b>	1.844	<0.001	1.489	2.284
<b>Can access a motor vehicle whenever needed</b>	0.700	<0.001	0.573	0.854
<b>Racist treatment in last 12 months</b>	1.467	<0.001	1.209	1.781
<b>Violence victim in last 12 months</b>	2.434	<0.001	1.958	3.025
<b>Daily smoking (vs does not smoke)</b>				
10 or less	2.197	<0.001	1.760	2.742
11 to 20	2.025	<0.001	1.546	2.653
21+	2.030	<0.001	1.439	2.863
<b>Constant</b>	0.027	0.000	0.017	0.040

**AIC reports**  
**Research Report**

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