FACTORS UNDERLYING INDIGENOUS ARREST RATES

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PREFACE

Ten years after the Royal Commission into Aboriginal Deaths in Custody the level of Aboriginal over-representation in Australian prisons is a continuing source of concern to both State and Federal Governments. If anything, that over-representation appears to be growing. In 1991 in NSW, for example, Indigenous Australians were nearly eight times more likely than non-Indigenous Australians to be in prison. By 1999, the level of Indigenous over-representation in NSW prisons had risen to almost ten times that of the non-Indigenous rate. In that year, persons of Aboriginal or Torres Strait Islander descent made up 15 per cent of the prison population despite making up only about two per cent of the total NSW adult population.

Research recently conducted by Joanne Baker at the NSW Bureau of Crime Statistics and Research has shown that one of the main reasons for the over-representation of Aboriginal and Torres Strait Islanders in NSW prisons is that they are arrested at much higher rates than non-Indigenous people. If we are to reduce the problem of over-representation it is critical to obtain better information on the reason for this state of affairs. The present report, prepared for the Bureau by Dr Boyd Hunter at the Centre for Aboriginal Economic Policy Research at the Australian National University, was designed with this in mind. Dr Hunter uses data from the National Aboriginal and Torres Strait Islander Survey to identify key independent risk factors for Indigenous arrest. While data limitations preclude any definitive statement of the causal factors which lie behind the high rates of Indigenous arrest, Dr Hunter's report provides promising leads in the search for these factors and promising new directions for policy.

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SUMMARY

The over-representation of Indigenous Australians in prison continues to be a serious problem, even a decade after the recommendations of the Royal Commission into Aboriginal Deaths in Custody were handed down. The greatest leverage for reducing Indigenous imprisonment rates appears to lie in reducing the rate at which Indigenous persons appear in court rather than in reducing the rate at which convicted offenders are sentenced to imprisonment. This would mean not only diverting Indigenous defendants away from court, but reducing the rate at which Indigenous persons are arrested, through using alternatives to arrest, reducing the rate at which they offend or re-offend and addressing inappropriate differential treatment of Indigenous persons by the criminal justice system.

A unique opportunity to analyse the processes underlying Indigenous arrest is provided by the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) data, with its unprecedented range of socioeconomic and cultural data. This report documents the factors associated with Indigenous arrest, rather than directly analysing the nature of offence (re-offence) or differential treatment by the police.

Data and method

Criminological research points to several factors that are likely to explain the Indigenous arrest rate:

- Sex;
- Age;
- Torres Strait Islanders, a distinct ethnic group within Indigenous Australia with relatively low arrest rates;
- The adequacy and availability of police services;
- Economic predictors of arrest, such as labour force status and education, which attempt to capture the labour market options of individuals and the capacity to communicate with various actors in the criminal justice system;
- Alcohol consumption;
- The extent of verbal and physical abuse in Indigenous community;
- Health conditions;
- Socioeconomic conditions within families — particularly the removal of children from their parents (sometimes known in the Indigenous context as the 'stolen generation');
- Housing need (included as a alternative measure of income poverty which tends to be poorly measured for Indigenous Australians); and
- Positive and negative peer group influences.

The NATSIS had valid information on these factors for 10,235 respondents aged 13 years and over (e.g., the poor quality of information available for prisoners meant that such data was not used in the main analysis). This data is used to estimate the probability of arrest for various groups of people to assess the relative importance of the factors underlying Indigenous arrest. The results are merely broadly indicative of the factors associated with arrest because of residual concerns about the direction of causality and measurement error.

Results

The six major factors underlying the high rates of Indigenous arrest include (in order of magnitude): sex, labour force status, alcohol consumption, whether a person had been physically attacked or verbally threatened, various age factors, and the respective education variables:

- Males are 13.1 percentage points more likely to be arrested than females;

- Having a job (especially a job not related to the Community Development Employment Projects (CDEP) scheme) appears to lower arrest rates;

- Alcohol consumption is one of the largest single factors underlying overall Indigenous arrest rates (12.8 percentage points more likely to be arrested);

- Having been physically attacked or verbally threatened increases arrest by a similar amount to the alcohol consumption (10.9 percentage points);

- The probability of arrest peaks among 18 to 24 year-olds and then declines, being lowest among Indigenous people aged 45 years and over; and

- With a few notable exceptions, education variables behave as predicted by criminological theory with the arrest rates declining as the level of schooling increases.

Other factors examined also had a significant impact on Indigenous arrest rates, including:

- Family environment and other social factors. For example, being taken from one's natural family significantly increases Indigenous arrest rates (5.1 percentage points);

- The adequacy and availability of police services also had a significant impact, albeit relatively small compared with that in other studies.

The overall results were robust, with the basic findings not changing substantially when the analysis was conducted separately for minors (under 18 year-olds), for each sex, or after prisoners were included in the analysis. The apparently small differences between the processes underlying male and female arrests points to cross-cultural or Indigenous specific factors being more important than gender related issues.

The top six factors underlying the various categories of arrests (drinking related, assaults, theft and outstanding warrants) are basically the same as those identified above. However, alcohol consumption and being a victim of physical attack or verbal threat are particularly important factors underlying arrests on drinking related and assault charges. This would seem to confirm the suspicion that there is a cycle of violence and abuse in Indigenous communities which is probably related to alcohol consumption.

Policy implications

Ensuring that Indigenous citizens stay out of the criminal justice system should be a priority for governments who are concerned about Indigenous wellbeing. Unfortunately, there are a limited number of policy instruments among the factors identified. For example, sex and age are not factors that will be responsive to policy intervention. However, it is important to take them into account in designing appropriate policy as attitudes and circumstances vary dramatically across demographic groups.

The policy implications are complicated by the fact that 'feedback mechanisms' have been identified where arrest reinforces disadvantage in several of these factors (especially, employment prospects and educational attainment). Any attempt to substantially reduce

the high rates of unemployment among Indigenous people also needs to make inroads into Indigenous arrest. Education policy needs not only to improve the marketability of the Indigenous workforce, but to facilitate the citizenship skills required to operate in both the Indigenous and non Indigenous domains.

Notwithstanding such feedback, improving labour market options of Indigenous people should markedly reduce the arrest rate. For example, securing employment for Indigenous workers reduces contact with the criminal justice system by: reducing the time available for illegal activities, reducing immediate financial disadvantage and directly improving people's ability to positively interact with Australian society (i.e., 'social capital').

The links between alcohol and crime, especially violent crime, are well documented. Substantial progress needs to be made on substance abuse problems before the cycle of violence in Indigenous communities can be broken. Restrictions on liquor supply are consistently nominated as producing the most tangible results in terms of reducing alcohol related harm among Indigenous Australians.

Family and social factors are less amenable to direct policy intervention. Indeed, the misconceived policy interventions that led to the 'stolen generation' appear to be a major factor underlying Indigenous arrest rates. The negative effects of such policies are likely to be driven by the traumatic disruption to family life and the loss of culturally appropriate parenting skills. Early intervention approaches to dealing with risk factors associated with antisocial and criminal behaviour appears to offer a promising avenue for policy action. It is important that Indigenous people have some control over how family services are provided (e.g., the need for Indigenous carers for Indigenous clients is often identified as an issue). The needs of children of Indigenous prisoners, especially those from country areas, should also be taken into account if the risk of delinquent behaviour is to be minimised.

The analysis in this paper should be reassessed when the Indigenous General Social Survey is conducted in 2002. The advantage of this survey is that analogous data will be collected for the non Indigenous population, thus providing a national benchmark against which to compare the Indigenous analysis.

BACKGROUND

The over-representation of Indigenous Australians in prison continues to be a serious problem, even a decade after the recommendations of the Royal Commission into Aboriginal Deaths in Custody (RCADC) were handed down (Baker 2001; Williams 2001).[1] For example, Baker (2001) finds that it stems initially from their higher rate of appearance at court, but is amplified at the point of sentencing, with Indigenous offenders sentenced to imprisonment at almost twice the rate of non Indigenous persons. The violent nature of the offences for which Indigenous people are convicted and the greater likelihood of Indigenous persons having prior convictions were also found to contribute to their higher rate of imprisonment. Baker (2001) concludes that the greatest leverage for reducing Indigenous imprisonment rates appears to lie in reducing the rate at which Indigenous persons appear in court rather than in reducing the rate at which convicted offenders are sentenced to imprisonment. This would mean not only diverting Indigenous defendants away from court, but reducing the rate at which Indigenous persons are arrested, through both using alternatives to arrest and reducing the rate at which they offend or re-offend.

Several important research questions remain unanswered. Why do Indigenous people appear in court at a rate five times higher than the rest of the population? Why are Indigenous persons more likely to appear for (and be convicted of) certain types of offences? (Baker 2001). Clearly factors such as the over-representation of Indigenous persons at arrest, the nature of Indigenous offending and re-offending, and the differential treatment of Indigenous persons by the criminal justice system will all have a part to play.[2]

In full awareness of these important gaps in the research literature, the New South Wales Bureau of Crime Statistics and Research (NSWBCSR) recently asked the Centre for Aboriginal Economic Policy Research (CAEPR) to analyse the predictors of arrest among Indigenous Australians. Another specification for the research was that CAEPR should, if possible, analyse separately Indigenous arrests for assault, theft, drinking related offences, and number of offences.

The 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) data, with its unprecedented range of socioeconomic and cultural data, provides a unique opportunity to analyse the processes underlying Indigenous arrest. The NATSIS was undertaken by the Australian Bureau of Statistics (ABS) in response to a recommendation by the RCADC that extra statistical information on the Indigenous population was required in order to better understand the range of factors contributing to deaths in custody (Commonwealth of Australia 1991).

Another reason to conduct this research is that NATSIS provides an opportunity to examine predictors of arrest within the Indigenous population. Policy needs to be informed by an understanding of what distinguishes those who are likely to be arrested from other Indigenous Australians. Statistical models can be used to provide a solid basis for assigning relative importance, or weights, to the various policies which attempt to reduce the incidence of Indigenous arrest.

It is important to recognise that this report builds on the NATSIS analysis in the 1997 Office of Evaluation and Audit (OEA) report (1997) and Borland and Hunter (2000). The OEA report provided one of the first regression analyses of the NATSIS, albeit on a

restricted sample consisting solely of unemployed and Community Development Employment Projects (CDEP) scheme respondents.[3] The OEA's focus on the CDEP scheme is understandable given that they were examining the effect of the scheme relative to its nearest alternative (in terms of labour force status).[4] This report generalises the OEA results to the Indigenous population as a whole, and uses the full potential of the public NATSIS sample to describe the factors underlying Indigenous arrest rates.

Broadhurst (1997, p. 417) argues that there is 'clear statistical support for the proposition that "race" or Aboriginality increases the risk of arrest'. However, he also cautions that 'Aboriginality may be a factor or variable that catches a number of stigmatising characteristics (such as truancy, unemployment, substance abuse) and in this sense operates as a shorthand "predictive" model for police'. Given that this study is confined to Indigenous respondents, it largely avoids addressing this problem. This is not to say that the effect of this style of 'policing' is eliminated, merely that all people in the survey will be, to a greater or lesser degree, subject to similar sorts of police attitude. Of course, if police pay greater attention to all Indigenous people, then they may notice the behaviour(s) of particular Indigenous persons which they believe may be related to offences, irrespective of the truth of the matter.

This report confines itself to examining the economic and social factors underlying the various types of arrest experienced by Indigenous people. That is, it examines arrest rather than analysing the nature of offence (re-offence) or differential treatment by the police. While the categories of arrest in the NATSIS are broadly based on various offences, it is important not to conflate the two concepts since people can be arrested without actually having committed an offence. The next section introduces the data and method required to identify the relative importance of various predictors of arrest before sketching out a rudimentary profile of Indigenous arrests and highlighting, wherever possible, the relevant comparisons with the experience of other Australians.[5] After a detailed analysis of the effect of various factors on the incidence and category of arrest, the concluding section discusses the policy options for addressing the high rate of arrest among Indigenous Australians.

DATA AND METHOD

Predictors of arrest

Broadhurst (1997, pp. 413–15) provides an extensive theoretical description of the determinants of criminal activity that underlie the high rates of Indigenous arrest. Based on these theoretical considerations, several variables have been used to predict which Indigenous people are most at risk of arrest, including: gender, age, Aboriginality of family, education, CDEP scheme employment, whether taken away from natural parents, availability of Indigenous police aides, alcohol consumption, region of residence and institutional factors specific to each State's criminal justice system (OEA 1997). Borland and Hunter (2000) also show that other factors are important including whether an Indigenous person: is a Torres Strait Islander, has voted in a recent election, or has had a long-term health condition. This section discusses the relationship of each of these predictors with Indigenous arrest, before introducing several household level factors which are potential predictors of arrest but omitted from existing empirical studies.

The distinct gender and demographic patterns of arrest are well known with male youth being particularly likely to have been arrested. Consequently, variables indicating whether or not a person was male and the broad age group of a respondent are included in the analysis.

Torres Strait Islanders are a distinct ethnic group within Indigenous Australia. Given there is substantial evidence that Torres Strait Islanders have relatively low arrest rates and higher socioeconomic status, it is important to use a separate ethnicity variable for this group (ABS/CAEPR 1997, p. 25).

One reason why Torres Strait Islanders appear to have low arrest rates may be that many of them live in remote parts of Australia. Not only are there fewer police to arrest people in such areas, but the general lack of infrastructure interacts with other aspects of the social and economic life of residents which, in turn, may be reflected in arrest rates. Such influences are captured using several geographic variables that indicate whether a person resides in either a capital city, other urban, rural or remote area.

One indicator of whether police services in a community are culturally appropriate is if it has either Indigenous police aides or liaison officers. Given the emphasis on adequacy and availability of police services in determining the incidence of arrest, it is desirable to include a direct measure of access to police. The predictor chosen from the NATSIS data was whether a respondent lived within 50 kilometres of a police station.

The economic predictors of arrest attempt to capture the labour market options of individuals and their capacity or willingness to communicate with various officials in the criminal justice system. For example, being employed may increase access to resources and hence reduce incentive for 'economic' crime. While the prolonged experience of unemployment may increase the time available to commit an offence, it may also increase an individual's dissatisfaction with Australian society (Hunter 2000a). CDEP scheme employment and a not-in-the-labour-force category are included separately as predictors because they also will reflect the labour market options of respondents (Hunter & Gray 1999).

Education is included in the analysis because it captures both aspects of the economic predictors of arrest. Well educated individuals are more likely to have skills that improve

their employability and enhance their ability to communicate with police and other officials within the criminal justice system. Two categories of education variables were included in the analysis: highest level of schooling completed (less than 6 years, years 6 to 9, year 10 or 11, year 12, and still at school), and whether a respondent had any post school qualification.

Given the preponderance of drinking related offences among Indigenous Australians, it is also necessary to include a control for alcohol consumption. The variable chosen was whether a respondent had ever drunk alcohol.[6]

A related problem in the Indigenous community is the extent of verbal and physical abuse (National Crime Prevention (NCP) 2001). While obviously not all violence originates within the community (e.g., there is both anecdotal and statistical evidence of police harassment of Indigenous people), if a cycle of violence is created, then related offences are likely to be perpetrated and prosecuted. The relevant NATSIS variable, which measures whether a person had been physically attacked or verbally threatened, provides an adequate, although imperfect, proxy for such factors (Carcach & Mukherjee 1996). Since such people are, in some sense, a 'victim' of other people's behaviour, they will be referred to by the shorthand of 'victim' for the remainder of this report.

Long-term health problems may also be related to Indigenous arrest. Health conditions may arise indirectly from behaviours associated with arrest (e.g., alcohol consumption). Alternatively, prolonged health problems could lead to enforced idleness and poverty, thus increasing the opportunity and incentive to engage in criminal activities.

Family influences are likely to be prominent factors associated with arrest (NCP 1999). Living in a family with dependants will tend to reduce arrest rates because of the moderating effect of extra family responsibilities. Alternatively, living in a family with non Indigenous people may reduce the incidence of arrest to the extent that such people tend to have better economic prospects. That is, this 'mixed family' variable is included to pick up socioeconomic factors not captured by other predictors.

Another family based predictor of arrest is whether an individual was taken from their natural family. Members of the 'stolen generation' who were taken from their natural families have experienced social dislocation and alienation, which anecdotal evidence suggests has significantly increased contact with the criminal justice system (Commonwealth of Australia 1997, pp. 12–16). The disruption to family life entailed in taking children from parents has been identified as a significant risk factor underlying arrest (NCP 1999).

While there are valid theoretical reasons for believing that poverty will be associated with arrest, there is no evidence of any significant relationship in any of the existing empirical literature (OEA 1997). One explanation for this may arise from the fact that raw income, which was used in the OEA study, is likely to be a poor proxy for poverty. The real cost of raising large Indigenous families needs to be reflected in the 'equivalence scale' used to adjust income for the size and composition of a family. Better measures of poverty can be derived by dividing raw family incomes by standard equivalence scales, such as the 1983 Organisation for Economic Cooperation and Development (OECD) scale.[7] Following Mitchell's (1991) 'median approach', this study defines someone as poor if they earn less than 50 per cent of Australia's median income for the period in question.

While this approach should provide a more robust measure of Indigenous poverty than raw family income, there are several reasons why one might expect poverty to be a less

significant factor than it is in general studies of the Australian population. For example, Hunter (1999; 2001b) finds that there is little relationship between arrest and poverty. One explanation for this is that measurement error is particularly prominent in Indigenous households where income sharing arrangements may be at variance to the Australian norms (Hunter 2001b). In view of these measurement issues, it is worth considering using housing variables as a more direct measure of Indigenous poverty. Variables that measure the housing stock (proxied by houses with an average of two or more residents per bedroom) and housing quality (captured by whether major household utilities are available and working) are included in the analysis to capture the effect of living without adequate access to resources.

Apart from the household level variables, other factors have been included in some modified form in previous empirical analysis. The last two household level variables included in the formal analysis attempt to capture the effect of peer group or social influences within the household. Living with others who have been recently arrested might be used to capture negative peer group influences on arrest prospects. Positive role models might be provided by people who constructively engage with the wider society, proxied here by voting in a recent election. Voting behaviour is a standard measure of the extent of social networks in the social capital literature (Hunter 2000b).

In line with Hunter's (2001a) recommendation, several other variables are included to ensure that all available information on Indigenous arrest is analysed. That is, extra variables are included where a large number of NATSIS respondents would otherwise be excluded from the formal analysis for not providing enough information. For example, one variable used indicates those households where residents are not sure whether there are any Indigenous police aides in the community. Another variable captures those respondents who did not state whether they had completed secondary school. A separate variable was also constructed to indicate households where valid income data was not available for all residents. While such variables are not easy to interpret, it is important that respondents are not excluded unnecessarily, especially if the resulting variable is of relatively minor importance.

The NATSIS sample

The sample design for the NATSIS was a multi-stage stratified random sample based on Census Collection Districts. The survey covered a total of 4,205 households, which yielded 15,726 Indigenous respondents, 3,076 non Indigenous persons living in the same household as an Indigenous person and 158 prisoners (ABS 1996).

Not all NATSIS respondents were used in the analysis. First, only people aged 13 years and over were included because they are the only ones for whom data on arrest is collected.[8] Second, non Indigenous respondents were excluded because only a small portion of the necessary data is collected from them. Finally, 158 persons who were in gaol at the time of the survey were considered for the analysis because they are, almost by definition, an important part of the population of Indigenous arrests—representing 1.8 per cent of the total sample.[9] However, given the mandatory constraints on prisoners' freedom and the way such constraints affect the interpretability of the data, the reported multi-variate analysis excludes this group. After imposing these restrictions a sample of 10,235 Indigenous persons remained. A sensitivity analysis which includes Indigenous prisoners was also conducted and is provided in the text where it differs substantially from the reported results.

Validating NATSIS data on arrest

One issue arising when analysing arrest data from a self response survey is the possibility of under-reporting of arrest. For example, Freeman (1994, p. 16) notes that it is common to find under reporting of crime in the United States by black youth. To examine potential under reporting of arrest of Indigenous Australians, one is restricted to a comparison between NATSIS data and official police data for Western Australia as this is the only State that reports official police arrest data disaggregated between Indigenous and non Indigenous persons. Estimates based on the official police data indicate that the proportion of Indigenous persons arrested in Western Australia between 1990 and 1994 was about 24.6 per cent.[10] The NATSIS results indicate that 25.4 per cent of Western Australians aged 13 years and over had been arrested in this period (ABS 1995, p. 60).[11] The closeness of the estimates of the proportion of the Indigenous population arrested in Western Australia from the NATSIS and official police data gives us some confidence that, at least at an aggregate level, under reporting of arrest is not a serious problem in NATSIS data.

Modelling NATSIS arrest

The periodic and relatively rare nature of arrest means that data must be collected over or relate to a reasonable period, usually using respondents' memory to recall interactions with the police. The designers of NATSIS opted for a questionnaire that asked whether a respondent had been arrested in the last five years. This pragmatic decision has important implications for the empirical model used to capture the factors associated with arrest.

$$y_{1it}^* = \alpha_2 \left(\sum_{\tau=t-1}^{\tau=t-5} X_{1i\tau} \right) + \gamma_2 \left(\sum_{\tau=t-1}^{\tau=t-5} y_{2i\tau}^* \right) + u_{1it} \qquad (1)$$

Equation 1 specifies that an individual's arrest record over the previous five years, y_{1it}^*, depends on variables which may be simultaneously determined with arrest (known in the econometric literature as endogenous regressors), $\left(\sum_{\tau=t-1}^{\tau=t-5} y_{2i\tau}^* \right)$, a set of other explanatory factors, $\left(\sum_{\tau=t-1}^{\tau=t-5} X_{1i\tau} \right)$, and a normally distributed error term, u_{1it}.

The reason for distinguishing endogenous regressors from other explanatory variables is that they can complicate the statistical model by inducing an 'endogeneity' bias into the magnitude and significance of the measured influence of the factors underlying arrest. Several of the proposed explanatory variables may be endogenous with arrest including labour force status, education, drinking behaviour and income. All other variables used in the regression analysis are unproblematic, at least in terms of the potential for endogeneity bias.

The issues surrounding endogenous variables can also be conceived in terms of reverse causality, which receives a detailed examination in the next section. The problems arising from such factors have been minimised or eliminated by the careful construction of the relevant explanatory variables.

Since the assumptions underlying the standard regression technique, Ordinary Least Squares (OLS), break down when analysing a discrete or dichotomous dependent variable, it is necessary to use another technique to estimate equation 1. One widely used estimator for dichotomous variables is utilised in this paper, the standard probit estimator (Greene 2000). This technique is appropriate as long as the possibility of 'endogeneity' bias has been eliminated.

Reverse causality and the differential timing of arrest and explanatory variables

The issue of reverse causality between potentially 'endogenous' or jointly determined variables clearly needs to be discussed. Unfortunately, given that the arrest variables in NATSIS refer to behaviour or outcomes in the previous five years and other variables are largely contemporaneous means that it is almost impossible to identify the extent that causation runs from arrest back to these potentially 'endogenous' variables. In any case, the econometric techniques involved to control for reverse causality require that suitable instruments are available and this is probably not the case.[12] Therefore, the correlations identified in this report are merely broadly indicative of the factors associated with arrest. Furthermore, given the temporal orderings of the arrest and most other explanatory variables, these factors can only be considered predictors of arrest to the extent that they are relatively permanent for individuals. That is, such factors are unlikely to change over time because of either migration or the intrinsically dynamic nature of such factors.

It is important not to overstate the problem of reverse causality. For example, joint estimation of employment and arrest in Borland and Hunter (2000) indicated that there was no significant 'endogeneity' problem. If this result is replicated between arrest and other labour force states, then the latter can be classified as an 'unproblematic' (non endogenous) explanatory variable.

Another reason to discount causality issues, is that variables can be constructed to ensure that they are, by definition, capturing relatively permanent factors. For example, alcohol consumption is measured in this report by whether a person has ever drunk alcohol before. In this way, it makes it unlikely that, except perhaps for very young respondents, the experience of arrest may influence drinking behaviour by putting a person into contact with the 'wrong crowd'.

Also, the preference for using housing stock and quality variables to proxy for the effects of poverty, as opposed to income, is likely to reduce or eliminate the potential for bias as the relationship between arrest and housing variables is at best indirect. In any case, since Borland and Hunter (2000) show that arrest is not significantly correlated with Indigenous wage income, 'endogeneity' bias is not likely to be an issue for family income or any transformations of that income (e.g., OECD measures of equivalent income).

The final rationale for ignoring potential joint causality of certain variables is that it is conventional to do so. Notwithstanding sound theoretical reasons for expecting that education and economic status are jointly determined, education is routinely included

as a standard explanatory variable in wage equations estimated by economists. If this protocol is followed, then we are effectively assuming that education is not influenced by the experience of arrest. This assumption probably breaks down for younger respondents and it is therefore important to separately analyse Indigenous minors and older NATSIS respondents (Hunter & Schwab 1998). Given the large differences in arrest profiles of males and females, the empirical analysis is also conducted separately by sex.

Concerns about 'endogeneity' were not ignored altogether. Despite the fact that Carcach and Mukherjee (1996) identified Indigenous perceptions of police being correlated with arrests, such variables were omitted from the analysis because it was not possible to be confident that an 'endogeneity bias' would distort the measured effect of other factors.

As noted above, information on all explanatory variables in previous time periods are not available—thus it is necessary to include explanatory variables from the current time period to proxy for effects from previous time periods. For some variables which are relatively 'permanent'—such as age, educational attainment, whether taken from natural family, and whether ever drank alcohol—use of 'current' period variables should not cause a significant loss of information. On the other hand, high rates of geographic mobility in the Indigenous population are likely to mean that variables related to current location may be less accurate as proxies for previous location (i.e., they may be mismeasured).[13] Measurement error of non endogenous variables can itself be a source of bias in the arrest estimates (Greene 1997). However, the use of broad geography to describe Indigenous arrest will minimise this problem, especially if people tend to move within a type of area (e.g., from one remote area to another).

The differential timing of arrest and explanatory variables has implications for the possibility of 'endogeneity bias' and measurement error. Working on the presumption that these issues have been fully addressed in the data construction and specification, the report will proceed with a standard probit regression analysis of Indigenous arrest.

Institutional factors

Before moving to the results section, it is necessary to briefly reflect on institutional factors left out of the specification. The omission of information on State or Territory of residence from the publicly available NATSIS data means that it is not possible to directly control for important institutional features of the criminal justice system that vary between jurisdictions. Another reason is that the inclusion of further data on residence will exacerbate the measurement error problems for the geographic variables.

Hunter (2001a) shows the analysis of Indigenous arrests based on the NATSIS appears to be insensitive to the inclusion of the State and Territory dummy variables. Using an otherwise identical specification to that used in OEA (1997), the size and significance of the effect of the major factors underlying arrest among Indigenous unemployed and CDEP scheme workers remain largely unchanged. Consequently, the influence of State and Territory is adequately picked up by other variables, especially the 'mixed family' variable (see Appendix A in Hunter 2001a).[14]

RESULTS

A profile of Indigenous arrest

The NATSIS informs us that about one in five Indigenous Australians were arrested at least once in the five years before the survey. For example, Table 1 shows that 31.6 per cent of males and 9.4 per cent of females aged over 13 years had been arrested in the last five years. Of those arrested the average number of arrests is approximately 3.0 for males and 2.3 for females (see Table 2). While youths aged between 18 and 24 years tend to have the highest incidence of arrest, there is an 'inverted U' profile with the youngest and oldest age groups tending to have very low arrest rates. In general, males are between three and four times more likely to have been arrested than females in each age group. The exception to this is males under 18 years old who are over five times more likely to have been arrested than under-aged females.

Table 1: Age and sex profiles of Indigenous arrest (percentage of age group), 1994

	Age group					
	13 to 17	*18 to 24*	*25 to 34*	*35 to 44*	*45 plus*	*Total*
Males						
Arrested in last 5 years	13.9	46.8	43.7	31.0	13.3	31.6
Reason for last arrest						
Drinking related arrest	1.2	22.9	24.8	17.9	7.7	16.1
Outstanding warrant	1.9	8.1	9.0	5.1	2.1	5.7
Assault	0.7	7.8	8.7	3.9	2.1	5.1
Theft	6.3	9.6	5.3	2.4	0.2	5.0
Females						
Arrested in last 5 years	2.7	16.7	12.7	9.4	3.3	9.4
Reason for last arrest						
Drinking related arrest	0.8	8.2	6.1	3.8	2.5	4.5
Outstanding warrant	0.2	1.5	2.3	0.9	0.2	1.1
Assault	0.2	3.3	2.8	2.0	0.3	1.8
Theft	1.1	2.1	1.9	0.4	0.0	1.2

Note: Drinking related arrests encompass drinking in public and drink driving. These profiles are weighted to reflect the Indigenous population in 1994.

Table 1 also shows that the most common reasons for arrest relate to intoxication—16.1 per cent of males and 4.5 per cent of females had charges for drink driving or drinking in public in their most recent arrest in the previous five years. While about three-quarters of drinking related male arrests had been charged with 'drinking in public', almost all such female arrests were associated with this offence (Hunter & Borland 1999, p. 3).[15]

In general, in their respective age groups, males tend to be between three and four times more likely to be arrested for the various offences than females. Males are even more likely to be arrested for outstanding warrants than females. For example, both teenage and older males (aged 45 and over) are about ten times more likely to be arrested for

that offence than females in their respective age groups. In contrast, relatively speaking, males are much less likely to be arrested for assault than females being only 2.8 times more likely to be arrested for this offence overall (5.1 per cent compared with 1.8 per cent). Notwithstanding some variation, Indigenous male arrest rates are scaled up by a factor of three or four.

As shown in Table 1, the other apparent difference between males and females is that female arrest rates peak a little earlier (at between 18 and 24 years) for most arrest categories, with the exception of outstanding warrants. Males tend also to have relatively high rates of arrest in the next oldest age group. Indeed, with the exception of theft, all categories of male arrest peak in the 25 to 34 years age group. This exception is not surprising in itself given that arrest for theft is more concentrated among Indigenous youth than any other form of arrest.

Table 2: Number of arrests (if arrested) in last five years by age and sex, 1994

| | *Age group* | | | | | |
	13 to 17	*18 to 24*	*25 to 34*	*35 to 44*	*45 plus*	*Total*
Males	2.6	3.5	3.3	2.7	2.3	3.0
Females	2.6	2.5	2.3	2.1	1.5	2.3

Note: Average number of arrests is for the subset of persons arrested in the previous five years. Persons with ten or more arrests were assumed to have ten arrests. Drinking related arrests encompass drinking in public and drink driving. These profiles are weighted to reflect the Indigenous population in 1994.

Table 2 shows that the calculation showing the average number of male arrests (given a person was arrested at least once) also displays an 'inverted U' profile across age groups, although the curve is somewhat flatter than that of Table 1. For example, the number of male arrests in the respective age groups only varies between 2.3 and 3.5. While the average number of arrests among females declines with age, the largest number of arrests in the last five years is for Indigenous females aged between 13 and 17 (arrested 2.6 times). This is consistent with a pattern of arrests which peak in an earlier age group for females.

Table 3: Arrest rate per thousand population by sex and Aboriginality in Western Australia, 1994

	Male	*Female*	*Male/female ratio*
Indigenous	313.8	116.6	2.7
Non Indigenous	32.1	6.4	5.0
Indigenous/Non Indigenous ratio	9.8	18.2	

Note. The population estimates used were calculated for those aged 10 or more. This is the age of criminal responsibility in Western Australia (Ferrante & Loh 1996, p. 40). Arrest rates calculated using police apprehension data from Ferrante and Loh (1996, p. 49), estimated residential populations for Western Australia from ABS (2000) and Indigenous population projections from ABS (1995, p. 94). The differences in these arrest rates from those reported in Ferrante and Loh (1996, p. 39) arise because of the more accurate estimates of the 1994 Indigenous population available in ABS (1995, p. 94; 2000).

Western Australian data also shed some light onto the potential role of gender in Indigenous arrest (Table 3). ABS (1995) showed that Indigenous males were about three-and-a-half times more likely to have been arrested in the last five years than Indigenous

females. This is roughly consistent with the sex ratio reported in the last column of Table 3 with Indigenous males being 2.7 times more likely to have been arrested than Indigenous females. In contrast, the ratio of male to female arrest rates among non Indigenous Western Australians was exactly 5.0. That is, Indigenous arrest rates are high for both males and females, but especially high for Indigenous females.

Stated another way, the differential risk of an Indigenous male being arrested compared with other Western Australian males was exactly 9.8 in 1994. Indigenous females were at even greater risk, being 18.2 times more likely to be arrested than other females in Western Australia—almost twice that of males in that State. In contrast to popular belief, Indigenous males are better off in terms of arrest than Indigenous females, at least relative to their non Indigenous counterparts.

To summarise, over 20 per cent of the Indigenous people aged 13 years and over were arrested at least once during the five years before the survey. More than three times as many males were arrested than females. Almost 47 per cent of males aged between 18 and 24 years were arrested at least once during the five years before NATSIS.

Preliminary analysis

The purpose of this report is to provide a more sophisticated description of factors associated with Indigenous arrest than is possible using simple cross tabulations. A multi-variate analysis of Indigenous arrest provides the prospect of identifying factors which continue to have a significant association even after the analyst controls for other factors. Preliminary analysis was conducted in order to refine the specification and ensure that only significant factors are reported in the final regression results.

Extensive preliminary analysis on the role of poverty in Indigenous arrest was inconclusive. Indeed, living in a poor household was not significantly associated with Indigenous arrest until basic demographic and geographic factors were controlled for. However, if one includes labour force status then there is no significance influence from poverty. Note that the household factors such as housing conditions and social factors within households do not affect this result. That is, once the higher individual probability of not having a job is taken into account, the direct measure of household poverty is not significant and can be ignored. This result was replicated in all regressions estimated and the OECD measure of poverty was therefore omitted from the final results.

Other variables were also introduced into the preliminary analysis but omitted from the reported results including, a broad indicator for having a post school qualification and whether a person was still at school. The lack of significant effect of either of these variables means that education is captured solely by the number of years of secondary schooling completed.

As a consequence of this preliminary analysis, three variables were omitted from the final specification, the OECD measure of poverty, post school qualification and whether a person was still at school. This final specification was used to estimate all reported results (see Table A1 in the Appendix for full list of variables).

Defining marginal effects and the 'reference person'

The coefficients of a probit regression are extremely informative but are notoriously difficult to interpret. One statistic that is relatively easy to interpret is the 'marginal effect' of each explanatory variable. This involves estimating the change in the predicted

probability of arrest arising from a given change in a variable, holding the value of the other variables constant. Since the effect of changes in the explanatory variables on the probability of arrested varies with the value of all the explanatory variables in the model, it is essential that marginal effects are measured at values which are representative of a significant proportion of the population.

The coefficients from a probit regression, and frequently marginal effects, are interpreted relative to the variables which are left out of the model so that estimation can proceed. Such variables define the 'base case'. The base case for the analysis in the rest of this report is:

- an Aboriginal female aged 18–24 years,
- living outside a capital city but more than 50 kilometres from a police station,
- whose community has access to Indigenous police aides/liaison officers,
- is employed but not in the CDEP scheme,
- who completed less than six years of schooling,
- who has never drunk alcohol,
- who has not been physically attacked or verbally threatened in the 12 months before the survey,
- does not have a long-term health condition,
- does not live in a family with dependent children or with non Indigenous people,
- has never been taken away from her natural family,
- lives in a household with less than two persons per bedroom and where the basic utilities are in a working condition, and
- other household members have neither been arrested in the previous five years nor have they voted in a recent government or ATSIC election.

Since this base case is in no way representative of the overall Indigenous population, it is fortunate that marginal effects can be calculated using alternative values for the respective explanatory variables. Instead, the marginal effects are estimated using the average characteristics of the sample provided in the Appendix and the standard procedure described in Greene (1997). Therefore, the reference person for the calculated marginal effects is the average Indigenous person (in the NATSIS), rather than the base case. In each case the marginal effect is calculated as the difference in probability of arrest for a person with and without the specified characteristic, with all other characteristics fixed at average values. While no single person embodies the 'average', this method results in the estimated marginal effects being more robust and relevant to a greater number of people.

All Indigenous arrest

Table 4 reports the marginal effect of the various factors underlying Indigenous arrest. The first line describes the probability of arrest for an 'average' Indigenous person over 12 years of age (excluding prisoners). All other rows show the marginal effect on this probability due to the presence of a particular factor. Unless otherwise stated, the benchmark for statistical significance in this report is whether a statistic is significant at the 5 per cent level.

Overall, the marginal effects shown in Table 4 confirm the analysis in Borland and Hunter (2000) where the probability of arrest was found to be significantly higher for males,

decreasing with age and years of high school, and to be lower for persons who were living in a mixed family, did not have a long-term health condition, had never drunk alcohol, lived in a remote region or in an urban area outside a capital city, or were Torres Strait Islanders. While their findings suggest that life cycle and human capital factors are important for explaining arrest, the probability of arrest is also strongly related to a person's family and socioeconomic environment. This section provides a detailed description of Table 4 paying particular attention to variables omitted in Borland and Hunter's analysis.

Table 4: Marginal effects of factors underlying Indigenous arrest

	All arrests	Drinking related	Assault	Theft	Outstanding warrant
Probability of an 'average' Indigenous respondent being arrested in the previous 5 years	17.0	9.6	3.0	2.4	2.6
Marginal effect of having a particular characteristic (%)					
Male	13.1*	4.7*	1.4*	1.3*	1.4*
Torres Strait Islander	-7.7*	-2.8*	-0.8*	-0.5*	-0.6*
Aged between 13 and 17	-4.5*	-3.8*	-0.8*	1.0*	-0.4*
Aged between 25 and 34	-0.5	0.6	0.1	-0.3*	0.1
Aged between 35 and 44	-4.8*	-0.6	-0.8*	-0.8*	-0.3*
Aged between 45 years and over	-9.5*	-2.6*	-1.3*	-1.1*	-0.8*
Live in a capital city	4.0*	0.6	0.0	0.3	1.0*
Rural area	-3.5*	-1.0*	-0.9*	-0.4*	0.0
Remote area	-4.2*	-0.9	-0.5	-0.5*	-0.2
Indigenous police aides in community	-1.5*	-0.8*	-0.5*	-0.3*	-0.1
Within 50 kilometres of police station	-5.1*	-2.8*	-0.4	-0.3	-0.2
Work in CDEP Scheme	8.1*	3.2*	0.8*	0.0	0.8*
Unemployed	13.1*	4.0*	1.2*	0.9*	1.2*
Not in the labour force	4.8*	1.3*	0.3	0.5*	0.9*
Completed 6 to 9 years of schooling	9.2*	2.0*	1.6*	1.7*	1.2*
Completed year 10 or 11	5.7*	0.9	0.6	0.9*	1.0*
Completed year 12	0.7	-0.6	0.1	0.6	0.5
Has drunk alcohol at least once	12.8*	7.2*	1.7*	0.7*	1.1*
Physically attacked or verbally threatened	10.9*	4.0*	1.5*	0.6*	0.4*
Long-term health condition	2.4*	0.6	0.7*	0.1	0.3*
Lives with non Indigenous persons	-2.5*	-1.0*	0.0	-0.4*	-0.4*
Living in family with at least 1 dependant	-0.8	-0.6	0.0	-0.1	0.0
Taken away from natural family	5.1*	0.9	0.4	0.4	0.5*
Crowded house	2.5*	1.4*	0.5*	0.2	0.2
Household utilities available and working	-3.0*	-0.4	-0.1	-0.4*	-0.2
Other householders arrested	3.6*	1.6*	0.5*	0.3*	0.3*
Other householders voted	-1.2	-0.4	0.4	0.0	0.0

Note: Marginal effect is the effect of having a particular characteristic relative to not having that characteristic, with all other characteristics equal to their average values listed in Table A2 (i.e., the average characteristics of the NATSIS sample). An asterisk denotes a marginal effect is significantly different from zero at the 5 per cent level.

Source: Based on regression coefficients in the Appendix.

Males are more likely to be arrested than females, being 13.1 percentage points more likely to be arrested. The differences between male and female coefficients mean that this differential will vary depending upon the relative endowments of males and females with this estimate probably providing a conservative estimate of the influence of gender. However, as noted above, the factors affecting arrests among Indigenous males and females are remarkably similar.

Torres Strait Islanders are much less likely to have been arrested (7.7 percentage points less likely than the average Indigenous person). In contrast to Borland and Hunter (2000), the inclusion of under 15 year-olds in Table 4 induces an inverted U relationship with age whereby the probability of arrest first increases with age then declines. The probability of arrest peaks among 18 to 24 year-olds and then declines, being lowest among Indigenous people aged 45 years and over. The oldest age group is 9.5 percentage points less likely to be arrested than other NATSIS respondents.

Arrest rates are significantly higher in capital cities than in urban areas, although the marginal effect is relatively small (4.0 percentage points). Indigenous arrest rates in rural and remote areas are significantly lower, but the size of the effect is again small (3.5 and 4.2 percentage points, respectively).

The policing variables are relatively less significant than they were shown to be by Borland and Hunter (2000). For example, the presence of Indigenous police aides only reduces arrest, albeit a statistically significant reduction, by 1.5 percentage points. Living within 50 kilometres of a police station also has a significant marginal effect (reducing arrest by 5.1 percentage points), but it is not as important, in relative terms, as was shown in the previous analysis. One explanation for this change in relative magnitude is that this study controls for labour force status, including CDEP scheme employment, which is concentrated in such areas. Notwithstanding the potential role of unobserved geographic factors, the fact that proximity to police actually significantly reduces the incidence of arrests means that one should not overemphasise the role of differential policing as a factor underlying Indigenous arrests.

Households where there was no clear indication of whether or not Indigenous police aides were available also had a significantly lower probability of arrest (see Appendix Table A4). One explanation is that there would be less opportunity to find out whether specialist police services were provided to Indigenous people if relatively few community members had been arrested recently. Alternatively, if a person did not anticipate being arrested because the assessment of the probability of arrest is based on the (low) number of people around them who have been arrested, then they may have less incentive to seek out information about Indigenous police aides.

Relative to those in non CDEP employment, other Indigenous people were more likely to have been arrested in the previous five years. This is consistent with theory that having any job should lower arrest rates by reducing the time available for illegal activities, reducing immediate financial disadvantage and improving the 'social capital' of workers who are in a better position to engage with the mainstream non CDEP economy. Consistent with the OEA (1997) report, the marginal effect of CDEP scheme jobs is significantly less than for the Indigenous unemployed although it is about the same as for the not in the labour force group (8.1, 13.1 and 4.8 percentage points, respectively).

Other important factors underlying arrest are the educational outcomes, which are not straightforward to interpret. Those completing between six and nine years of education

have very high rates of arrest (9.2 percentage points higher than those with other levels of schooling). However, the marginal effects of more education are significantly less, being only 0.7 percentage points for those who complete secondary school.

Why do people who have not had any secondary schooling have relatively low rates of arrest? One possibility is that such people are concentrated in remote and rural areas that are lightly policed. That is, the omitted education variable is picking up unmeasured geographic factors or the relatively short history of colonisation for people with limited exposure to the mainstream educational system (i.e., probably in remote parts of Australia). The other education variables behave as predicted by various criminological theories, with the arrest rates declining as the level of schooling increases.

Drinking of alcohol is one of the largest single factors underlying overall Indigenous arrest rates (12.8 percentage points), not only drinking related offences. Clearly, alcohol consumption needs to be addressed if significant inroads are to be made into the over-representation of Indigenous people in the criminal justice system.

While alcohol has a large impact, other factors have a similar, or greater, influence on arrest outcomes. In addition to the education variables or being unemployed, having been physically attacked or verbally threatened increases arrest by a similar amount to the alcohol consumption proxy (10.9 percentage points). One explanation is that being a 'victim' is likely to be associated with situations which lead to police being called on to intervene. Another is that there is a cycle of violence being perpetrated within the Indigenous community with persons who have been subjected to such violence and threats lashing out at others, possibly more vulnerable than themselves, in the local vicinity.

Long-term health conditions are also associated with a significantly higher rate of arrest, although the marginal effect is much smaller than for many other factors (2.4 percentage points).

Several 'family' variables also have a significant effect on arrest. Among these, living with non Indigenous people and being taken from one's natural family are significantly associated with Indigenous arrest rates (-2.5 and 5.1 percentage points, respectively). The former may be a result of the higher socioeconomic status of non Indigenous family members, while the latter is probably a result of a sense of dislocation from a society which permitted these dubious practices to occur (Commonwealth of Australia 1997).

Having been taken away from one's natural family as a child is the major 'family' influence. While a similar effect is likely to be found among the non Indigenous population, the extent of the 'stolen generation' means that such effects will be more widespread among Indigenous people being found among all strata of society and in all socioeconomic status groups (Hunter 2001b).

The other family variable is whether a respondent lives in a family with at least one dependent child. Given that dependants exerted no influence on overall male and female arrests, it is not surprising that the marginal effects are negligible (see Table 4). However, as indicated below, responsibilities (and the tighter time constraints) associated with parenthood and guardianship still affect certain categories of female arrest (i.e., arrests for drinking related charges and theft).

The housing stock variables are significant and have the expected sign. For example, living in a crowded house with more than two residents per bedroom increases arrest rates by 2.5 percentage points. The quality of the housing stock also matters, with

residents of households where all the basic household utilities work have a significantly lower arrest rate (of 3.0 percentage points).

The 'peer group' or social influences within the household also significantly affect Indigenous arrest. Living in a house where others have been arrested in the last five years increases Indigenous arrest by 3.6 percentage points. Not only do negative peer influences increase arrest but positive role models may also reduce arrests. For example, living with people who exercised their citizenship rights and voted in a recent election reduced arrest by 1.2 percentage points. However, this positive peer effect was only statistically significant at the 10 per cent level.

Concerns about the NATSIS data quality for prisoners, arising from the constrained nature of their choices and consequent distortions in responses to various questions (e.g., labour force status) led to the exclusion of such data from the calculations underlying Table 4. In any case, the other data for prisoners were either of questionable quality (e.g., no prisoners indicated they had dependants) or driven by the assumptions required to derive them (e.g., prisons were assumed to have adequate housing). However, results were not substantively changed by including data on the 158 prisoners in the NATSIS, the vast majority of whom had been arrested in the previous five years. The only noteworthy changes arose from the variables for dependants and positive peer group influences, which significantly affected all the estimated probabilities of arrest once prisoners were included, although the marginal effects were still rather small relative to those for other factors. Unfortunately, one cannot discount the possibility that these changes are a result of poor data quality or the assumptions used in data construction among prisoners. Given this qualification, more weight should be attached to the analysis that excludes prisoners.

Analysis by sex and broad age group

The profile of Indigenous arrests appear to point to substantial differences between various age groups. Given that the criminal justice system treats minors differently from adults, there are sound theoretical reasons to expect the factors underlying arrest to vary between 13 to 17 year-olds and persons aged 18 years and over. Notwithstanding, the empirical analysis by broad age group indicates that age based differences were smaller than anticipated and can be explained in terms of the relatively small numbers of under aged respondents in the NATSIS (see the Appendix).

Only two coefficients estimated for adults were outside the confidence interval of the estimates for minors. The coefficients for the variables indicating the presence of Indigenous and non Indigenous family members (i.e., so-called 'mixed families') and the quality of the housing stock were both significantly less for minors than among adults. Since the incidence of mixed families varies significantly across Australian States and Territories, it may be capturing differences in the institutional treatment of juvenile offenders. In any case, the marginal effects of either of these variables are not significantly different between broad age groups.

Similarly, there are relatively few differences between coefficients for males and females if one ignores the obvious differences in levels of arrest (see the Appendix). Consequently, marginal effects tend to be scaled up by the average differential in arrest data (i.e., males are about 3.4 times more likely to be arrested than females in the NATSIS).

The main differences arise from the not completing secondary school, and several family, household and peer variables. For example, only completing six to nine years of school

(relative to somebody who attended for less than six years) increases the probability of arrest by 14.7 percentage points for males—significantly more than the analogous marginal effect for females of 4.5 percentage points. Therefore, notwithstanding the significant differences in education coefficients for the respective sexes, the marginal effect is roughly in proportion to the average differential.

The differences between the sexes are less proportionate for some of the other variables. Being taken from one's natural family has a significantly larger effect on males than on females; males being over five times more likely to have been arrested (10.1 and 2.0 per cent, respectively). Note that the effect of the stolen generation among females is only significant at the 10 per cent level.

Two household level variables appear to have a significant effect on males but not on females. Living in a house where all the basic utilities work significantly reduces the probability of male arrest by 7.1 percentage points. The fact that such factors are measured at household level means that it is impossible to target policy specifically at male members of the household.

The other, somewhat subtle, difference between the sexes arose from the pattern of significance of the presence of dependants in a family. While the presence of dependants did not affect the probability of arrest for males for any category of arrest, it significantly affected the probability of female arrest in the drinking related and theft related arrests (marginal effects of –0.6 and 0.2 percentage points). That is, having children reduces female arrests arising from alcohol consumption, presumably because of the moderating effect of extra family responsibilities. Ironically, the small, but significant, increase in female arrests for theft may also result from extra responsibilities in that the economic incentive to steal may derive from a need to provide resources for children within poorer households. In contrast, males are not responsive to such pressures. However, even when the effect of dependants on the various types of arrest is significant for Indigenous females, the marginal effects are small in both relative and absolute terms.

The result that dependants do not affect overall arrest rates among females would be a surprising result if it were found in an analysis of non Indigenous females. The overall minor nature of the differences between this NATSIS analysis of male and female arrests points to cross cultural or Indigenous specific factors being more important than gender related issues. This is consistent with the ratios expressed in Table 3 which indicated that, in terms of arrest rates, Indigenous females were worse off relative to their non Indigenous counterparts than Indigenous males were, relative to theirs.

Having described the factors associated with overall Indigenous arrest, attention is now turned towards whether these factors vary for the various categories of arrest. Table 4 illustrates that the direction of influence of the factors is virtually identical for the various types of arrest with most difference arising from the size and significance of the marginal effects. Given the large and significant association of alcohol consumption and Indigenous arrest, it is appropriate that the focus is placed first on drinking related arrest.

Drinking related offences

Drinking related offences dominate the overall arrest profiles of Indigenous Australians, comprising well over 50 per cent of all arrests (9.6 per cent out of the 17.0 per cent of the NATSIS respondents were arrested at least once in the last 5 years). Consequently, it is not surprising that drinking related arrests are affected by similar factors to those

identified above. The top five influences still include sex, labour force status, alcohol consumption, the 'victim' proxy, various age factors, and the cluster of education variables. However, there is some re-ranking within the most important factors, with alcohol consumption being the most important influence for such arrest (7.2 percentage points), displacing sex into second place (4.7 percentage points). The observation that alcohol consumption is strongly related to such arrest is no surprise since these variables will be correlated by definition.

The next most important factors are whether a person has been a 'victim' or is unemployed (both with marginal effects of 4.0 percentage points). The importance of the 'victim' variable in drinking related arrests means that the phenomena may be closely linked.

The pattern of significance is also noteworthy. Several factors were not significant for drinking related arrests but were significant for regression of all Indigenous arrests. Among the insignificant variables, those for capital cities and remote areas stand out. The correct interpretation of this is that drinking related arrests are just as likely to occur in capital cities, other urban areas and remote areas, but they are slightly less likely to occur in rural areas (a marginal effect of 1.0 percentage points).

Long-term health conditions and living in poor quality housing where basic household utilities do not work are also not significant. The influence of housing stock is through living in a crowded house. The result for health conditions is particularly interesting because it seems to suggest that health problems are not related to drinking related arrest and, by inference, the consumption of alcohol, which is the largest single correlate with such arrests. This provides indirect evidence that health conditions are not strongly correlated with drinking behaviour and hence suggests that the influence of health problems may be through enforced idleness and poverty, which in turn increase the opportunity and incentive to engage in criminal activities.

Assault

The top six factors underlying Indigenous assaults are very similar to those identified above. In order of magnitude these include: alcohol consumption, education, a victim of physical attack or verbal threat, sex, age, and labour force status. While the link between consumption of alcohol and violence is well established, the prominence of this factor may be related to the public nature of much Indigenous drinking (Drugs and Crime Prevention Committee 2000).

The probability of being arrested for assault declines with years of secondary school, being heavily concentrated among those with only a few years of secondary schooling (marginal effect of 1.6 percentage points). However, Indigenous people with little education (having primary schooling or no formal schooling) have the least chance of this type of arrest. This may indicate that this variable is capturing variations in the State based education systems. Alternatively, it may be picking up the detrimental effect of imposing a largely alien education system onto Indigenous peoples with the consequent impact on their cultures and social cohesion (Dawes 2000).

After the effect of alcohol consumption (1.7 percentage points) and education, sex and being physically attacked or verbally threatened are the next most important factors underlying Indigenous arrests for assault (both having marginal effects of about 1.5 percentage points). While being male is still an important factor underlying assault, it is relatively less important than it is for other forms of arrest. Unless the relatively small

marginal effect of being male on assault is replicated in the non Indigenous population, this confirms there are fewer gender differences in the Indigenous population than in the rest of the community. In terms of homicide, there is overwhelming evidence that extremely violent assaults are heavily concentrated among men in the larger community (Easteal 1993), and hence the difference between Indigenous women and other Australian women is likely to be larger than the analogous difference between Indigenous and non Indigenous men. Notwithstanding the lack of an academic consensus on a causal relationship between alcohol and violent crime (Murdoch, Pihl & Ross 1990), there is a widespread belief that the relationship between alcohol use, aggression, and alcohol related aggression over time are conditioned by gender (Nunes Dinis & Weisner 1997; White & Hansell 1996). This presumption does not appear to be valid for Indigenous Australians.

As with the drinking related arrest, being a victim of a physical attack or verbal assault is relatively more important than it is for other types of Indigenous arrest. This would seem to confirm the suspicion that there is a cycle of violence and abuse in Indigenous communities which is probably related to drinking related behaviour.

In addition to listing the significant factors underlying Indigenous assault, it is worth considering the insignificant factors, especially where there are some differences between the various types of arrest. There are no significant differences in the rate of arrest associated with assault charges in capital cities and other urban areas, although such arrests are less likely to occur in rural or remote areas. The other insignificant variables include living with non Indigenous people, the quality of the housing stock and peer group effects. The lack of significance of such factors probably indicates the low power of the statistical analysis when examining relatively infrequent occurrences (only 3.0 per cent of NATSIS respondents were arrested for assault) than it does about the influence of these factors. Indeed, with the exception of the proxy for positive role models, all these factors affected assault in the same direction as for other categories of arrests.

Theft

Given the relatively lower probability of arrest for theft (2.4 per cent), the marginal effects for such arrests will also be proportionately smaller, and probably less significant, than for most other types of arrests. The largest marginal effect was for completing between six and nine years of schooling, at 1.7 percentage points.

The relative importance of education vis-à-vis other arrest categories is not surprising. Given that education is the largest single determinant of Indigenous wages (Daly 1995; Hunter & Gray 2001), and theft is often directly associated with an anticipated economic gain (if not caught and prosecuted), education and theft should be expected to have a relatively strong correlation. This is consistent with the fact that being unemployed and living in poor quality housing are both associated with a significantly higher probability of a theft related arrest.

The other variables with the six largest influences on Indigenous theft, in order of size of marginal effect, are: sex, age, labour force status, alcohol consumption, and the 'victim' proxy. In contrast to the other forms of Indigenous arrest, drinking alcohol is relatively less important among people arrested for theft. That is, while alcohol consumption still has a significant effect on being arrested for theft, it is not as important as factors that can be directly related to an economic motivation for theft.

The age profile of Indigenous theft related arrests is another distinguishing feature of such arrests with minors being 2.1 percentage points more likely to be arrested for this offence than people aged over 45 years of age. Arrests for theft peaked in the youngest age group before gradually declining in the older groups. This is again consistent with an economic motive for theft given the lack of opportunities for economic independence among Indigenous youth. An alternative institutional based explanation is that Indigenous youth have less legal access to alcohol and therefore their composition of arrest will be biased away from those categories which are strongly associated with drinking behaviour.

The lack of significant influence of certain factors such as long-term health conditions, distance to the nearest police station, and one of the proxies for peer group influences is again likely to be attributable to the power of the data to discriminate between alternative hypothesis when analysing infrequent occurrences. Even if the marginal effects were not significant in their own right, they were all in the direction predicted by the theory described above.

Outstanding warrants

An outstanding warrant could be characterised as a 'second order' arrest which relates to the failure to respond to a legal order, such as those arising from another category of arrest. Notwithstanding, it is analysed in this section in order to provide insights into why many Indigenous Australians do not comply with legal orders (usually to attend court proceedings over another charge). While fewer Indigenous people are arrested for outstanding warrants than on drinking related charges or assault (2.6%, 9.6% and 3.0%, respectively), it is still a major factor underlying Indigenous interactions with the criminal justice system.

The factors underlying arrest for an outstanding warrant are again similar to those identified for all Indigenous arrest. Like the other types of arrest, having completed year 12 does not lessen the impact on this form of arrest relative to those without any education. Stated another way, there is no significant decline in the probability of being arrested for an outstanding warrant in those completing secondary school. Given a common expectation that education informs students of the consequences of their action and should provide them with the capability to deal with societal institutions, this is a surprising result. It calls into question the nature of the curriculum and the effectiveness of secondary school in imparting this 'citizenship education'. Another more plausible explanation is that people with some education are more willing to argue their case with authorities. For example, a person with a secondary education may have been made aware of the injustice of a particular legal order, but probably will not have the legal background to effectively challenge such orders. In this case, the problem may not be with the school system, but rather with the criminal justice system.

Number of arrests

Hunter (2001a) uses an identical set of variables to analyse the number of arrests among NATSIS respondents using several statistical models. With virtually no exception, the analysis of multiple arrests confirms the pattern of significance (and relative magnitude) of the factors underlying Indigenous arrests generally. Not only are economic, alcohol-related, demographic, geographic, and human capital factors important, but the probability of arrest is also strongly related to a person's family, housing stock and socioeconomic environment.

DISCUSSION

Indigenous Australians are over represented at almost every stage of the criminal justice system. Studies by the Australian Institute of Criminology (AIC) and others have consistently produced evidence of the over-representation of Indigenous Australians at the different stages of the criminal justice system (Carcach & Mukherjee 1996).[16]

Much of the public debate focuses solely on how to divert Indigenous people away from the court system and from gaol (Cunneen & McDonald 1997). Unfortunately, unless the tide of Indigenous people being arrested is directly addressed, the success of these diversionary policies will be severely circumscribed with a disproportionate number of people getting through the cracks in the system, eventually ending up in court, and, ultimately, in gaol. Couched in these terms, the crucial policy question is how to reduce the rate at which Indigenous Australians are arrested.

The analysis in this report provides a strong empirical and theoretical justification for the policy recommendations of the RCADC (Commonwealth of Australia 1991). In particular, ensuring that Indigenous citizens stay out of the criminal justice system should be a priority policy issue for governments who are concerned about Indigenous wellbeing. For example, the major factors underlying the high rates of Indigenous arrest include sex, labour force status, alcohol consumption, whether a person had been physically attacked or verbally threatened, various age factors, and the cluster of education variables. The policy implications of the analysis are complicated by the fact that feedback mechanisms have been identified where arrest reinforces disadvantage in several of these factors over the longer term. Borland and Hunter (2000) and Hunter and Schwab (1998) examine the role of arrest in depressing Indigenous employment and educational attainment.

Unfortunately, there are a limited number of independent policy instruments among these correlates of Indigenous arrests. For example, sex and age are not factors that will be responsive to policy intervention. However, it is important to take them into account in designing appropriate policy as attitudes and circumstances vary dramatically across demographic groups. Labour market programs, educational courses, and information dissemination need to take into account the requirements of the target audience (Taylor & Hunter 1996).

The policy implications of the role of geographic location may not be immediately apparent. Other than encouraging mobility from areas of high arrest (which would be politically unpalatable and undesirable), policy could attempt to address structural difficulties in the regions affected, by funding adequate infrastructure. Ironically, if the above analysis can be taken at face value, building police stations closer to Indigenous communities may actually help reduce arrest rates. Certainly, provision of Indigenous aides in existing police stations will help achieve this result.

As indicated above, both employment and education are implicated in a vicious cycle, which reinforces Indigenous over-representation among Australian arrests. Any future attempt to substantially reduce the high rates of unemployment and idleness among Indigenous people also needs to make inroads into Indigenous arrest. Education policy needs not only to improve the marketability of the Indigenous workforce, but to facilitate the citizenship skills required to operate in both the Indigenous and non Indigenous domains (see Groome & Hamilton 1995 for an overview). It is important not to underestimate the magnitude of the task given that Indigenous youth sub-cultures may value resistance to mainstream education above any citizenship skills provided (Dawes

2000). This resistance is also outlined in the conflict theories about Indigenous involvement in crime (Cunneen 2001).[17]

The role of CDEP in lowering Indigenous arrests relative to the unemployed confirms the OEA (1997) analysis, but in a more general setting. The continued expansion of the CDEP scheme is likely to play a role in mitigating the Indigenous over-representation in arrest statistics (Hunter & Taylor 2001; Taylor & Hunter 2001).

The prominence of the correlation between alcohol consumption and Indigenous arrest is consistent with findings from the National Police Custody Survey (see AIC 1994). The links between alcohol and crime (violence, disorder and acquisitive crime) are well documented (see Ramsay 1996 for a review on this topic). The cycle of violence perpetuating violence, which ultimately leads to high rates of Indigenous arrest, is demonstrated by the significance of the variable capturing whether a respondent had been physically attacked or verbally threatened. Substantial progress needs to be made on substance abuse problems in Indigenous communities before this cycle of violence can be broken.

Pearson (2000, pp. 16–20) speculates about the impact of alcohol on Cape York Aboriginal societies and links this to the 'poison of welfare dependency'. Martin (2001) criticises his focus on reforming the delivery of welfare because it leads him to underestimate how deeply alcohol is implicated in the production and reproduction of the problems identified. However, there are potential avenues for addressing a crucial structural issue in the facilitation of social change, including the supply of alcohol through the canteens controlled by the Cape York community councils (Martin 1998).

This is not the place to review all of the literature on effective alcohol policies for Indigenous people (see Brady 2000 for an overview). However, it would be remiss not to point out that restrictions over supply are consistently nominated as producing the most tangible results in terms of reducing alcohol related harm among Indigenous Australians (Gray et al. 2000).

The significance of household factors, such as the quantity and quality of the housing stock, points to an obvious avenue for active policy intervention. The intrinsic difficulty in measuring and defining income in a cross cultural setting means that obvious indicators of deprivation (such as a decaying housing stock) provide a better signal than household income measured against a national benchmark (see Hunter 2001b for a description of cross cultural issues in income measurement). In light of the general insignificance of poverty itself as a predictor of arrest, it may be better that housing policy focus directly on improving the housing stock in Indigenous communities rather than relying solely on welfare transfers so that people could afford adequate housing.

Family and social factors are less amenable to direct policy intervention. Indeed, misconceived policy interventions that led to the 'stolen generation' appear to be a major factor underlying Indigenous arrest rates. The negative effects of the policies that gave rise to the 'stolen generation' is likely to be driven by the traumatic disruption to family life and the loss of culturally appropriate parenting skills. A recent government report identified several developmental and early intervention approaches to dealing with risk factors (as well as outlining protective factors) associated with antisocial and criminal behaviour (NCP 1999). The factors canvassed include: child factors, family factors, school context life, life events, and community and cultural factors. Unfortunately, while there are over ten thousand early intervention programs operating in Australia, it is rare to find any explicit reference to crime prevention and consequently conscious strategies to address such problems are absent.

NCP (1999) paid considerable attention to issues of particular relevance for Indigenous people (pp.183–5). In addition to highlighting the role of the 'stolen generation', it emphasised the importance of Indigenous control over how family services are provided, access to education and the need for Indigenous carers for Indigenous clients. The report also identified that the special needs of children of Indigenous prisoners, especially those from country areas, should be taken into account if the risk of delinquent behaviour is to be minimised.

The inter-relationship of many of the pathologies in the Indigenous communities are highlighted by the effect of long-term health conditions on arrest. The extensive and growing literature on policy debate on Indigenous health needs to be informed by an awareness that health outcomes reinforce disadvantage in a range of social indicators (Gray et al. 2001; Hunter 2000a; Hunter & Gray 1999).

Peer groups can also assist in reducing Indigenous arrest rates at the margin. Ensuring that people stay away from negative role models appears to be more important than providing positive models to look up to. This result highlights the self reinforcing nature of Indigenous arrest and underscores the importance of continued efforts to reduce the rate of imprisonment and other sources of negative role models.

This report has been careful to distinguish between whether an offence was committed and the fact of being arrested. Unfortunately, existing data sources do not permit the analyst to separate the offence from the arbitrary actions of certain police or indeed the systemic cultural inflexibility of the criminal justice system. The antecedents of arrest and how Indigenous people interpret these events are crucial in understanding the role that cultural factors might play in the contacts between Indigenous Australians and the police (Carcach & Mukherjee 1996). Unfortunately, it is probably unrealistic to expect an omnibus survey like the NATSIS to collect data on the perspectives of the various actors in this process. In any case, the cross cultural tensions in reconciling such data would probably render any regression based empirical analysis intractable, insignificant or hopelessly biased. In these circumstances, a case study or ethnographic approach is more likely to illuminate the issues that need to be addressed by policy makers.

Carcach and Mukherjee (1996) claim that the NATSIS approach to gathering law and justice information was too conservative. For example, there were no explicit links between the issues of culture, victimisation and deviant behaviour. They conclude that future data collections need to focus on issues of crime, violence and family violence. The first opportunity to revisit these issues will be when the Indigenous General Social Survey (IGSS) is conducted by the ABS in 2002 as it will cover many of the same issues addressed in the NATSIS. The advantage of the IGSS is that analogous data may be collected for the non Indigenous population providing a national benchmark against which to compare the Indigenous analysis. Furthermore, the IGSS will be collected every 6 years and the issues flagged above can be re-visited at that time.[18] However, it is important that our expectations of the IGSS data are not too high as measurement error in arrest and various explanatory variables, combined with the intrinsically culturally sensitive nature of analysis, means that the empirical analysis of Indigenous arrest will continue to be only broadly indicative. Given that causality issues are still contestable in academic literature (Murdoch, Pihl & Ross 1990), there is little hope they can be easily resolved in a cross cultural context simply by collecting better and more comprehensive data. In the meantime, policy makers will need to content themselves with addressing the significant factors identified using the NATSIS data or appropriate case studies.

NOTES

1 The recommendations emphasised the need to reduce the disproportionate levels of Aboriginal persons in custody, rather than the need to directly prevent their deaths. This emphasis arose out of the Royal Commission's conclusion that the 99 Aboriginal deaths in custody which occurred during the 1980s were not a result of Aboriginal persons being any more likely than others to die in custody, but were a result of their gross over-representation in prison.

2 See Broadhurst et al. (1994) and Cunneen and McDonald (1997).

3 The CDEP scheme is a Federal government program in which unemployed Indigenous people forgo their entitlements to Newstart Allowance payments but receive the equivalent from a local community organisation in return for work. It is distinguished from the work-for-the-dole scheme in having a much longer history (beginning in 1977), in being specific to Indigenous communities, and having a broader community development component.

4 Hunter (2001a) provides a detailed analysis of the OEA report, including a test of whether the results are sensitive to the inclusion of State-specific institutional factors, and hence whether it is possible to use publicly available NATSIS data.

5 Prisoners were included in the descriptive statistics in this section because the data on demographics and arrest appears to be of reasonable quality.

6 Preliminary analysis revealed there was no significant loss of information by collapsing two variables that broadly measured the frequency of alcohol consumption into one variable. That is, there is no significant gain in distinguishing frequent drinkers (defined as those who drank in last week) from less frequent drinkers in any of the regressions examined.

7 The OECD scale is described in full in Mitchell (1991). It gives a weight of one to the first adult, 0.7 to the second and subsequent adults and 0.5 to all dependants.

8 Depending on the age of criminal responsibility in the various States people under this age can be, and are, arrested.

9 For more details on the characteristics of the population in gaol at the survey date, see Carcach and Mukherjee (1996).

10 Official police data show that in each year from 1990 to 1994 total arrests were 15.9 per cent, 16.9 per cent, 15.9 per cent, 15.6 per cent, and 15.9 per cent of the Indigenous population in Western Australia (Ferrante & Loh 1996, p. 39). To make the official police data comparable with the NATSIS data it is necessary to convert the annual percentages to an estimate of the proportion of the Indigenous population arrested over the previous five years. This calculation is made by summing total arrests as a percentage of the Indigenous population across the five-year period from 1990 to 1994, and then adjusting to take account of persons who were arrested multiple times throughout the period. The adjustment uses a measure of the average number of arrests per arrested person over the previous five years in Western Australia derived from the NATSIS data (3.3 arrests). This method of calculation provides an estimate from the official police data of the proportion of Indigenous persons arrested in Western Australia between 1990 and 1994 of 24.6 per cent.

11 Note that no account is taken of the possibility that some persons living in Western Australia at the time of the NATSIS had been arrested in other States, or that some persons recorded in official police data as having been arrested in Western Australia during 1990 to 1993 were no longer living in Western Australia in 1994. However, inter State mobility is generally fairly low—for example, Taylor and Bell (1996, p. 397) report that only 5.1 per cent of the Indigenous population moved between States from 1986 to 1991.

12 That is, instruments must be, in econometric language, both 'valid' and 'identified'.

13 For example, Taylor and Bell (1996) using 54 Census Statistical Divisions found that about 47 per cent of the Indigenous population changed residence between 1986 and 1991.

14 The large variation in the number of mixed families in the respective States and Territories appears to depend upon the history of colonisation, with the Northern Territory, Western Australia, South Australia and Queensland having relatively few 'mixed' families (Ross 1999).

15 Note that more than one reason for the last arrest may be given by NATSIS respondents.

16 For example, the National Police Custody Surveys conducted by the AIC in 1988, 1992 and 1995 showed that Indigenous Australians were between 26 and 27 times more likely to be taken into police custody than other Australians (AIC 1994). On the other hand, data from the National Prison Census (AIC 1982–1993) showed Indigenous people as being 13 or 14 times more likely to be in prison than the rest of the population.

17 The essential theme of conflict theory is that the legitimacy of the law is rejected by the 'outside group' because it fails to recognise or represent their values. Recent revisions of Australian history, which emphasise the struggle between races over land use, have acted as a stimulus to conflict theories of Indigenous arrest (Reynolds 1982). Anthropological studies show that ongoing cultural conflict can lead to profound differences in legal sensibilities as to the content of the law and the basis of collecting evidence (Poole 1986). While the occasional riot in country towns gives the impression of rebellion or protest, cultural conflict is likely to be a subtle problem, which may not be overtly evident.

18 A General Social Survey, which includes non Indigenous people, will be conducted every three years from 2002.

REFERENCES

Australian Bureau of Statistics (ABS) 1996, *Technical Paper: 1994 National Aboriginal and Torres Strait Islander Survey—Unit Record File*, Cat. no. 4188.0, ABS, Canberra.

ABS 1995, *National Aboriginal and Torres Strait Islander Survey 1994: Detailed Findings*, Cat. no. 4199.0, ABS, Canberra.

ABS 2000, *Population by Age and Sex, Australian States and Territories*, Cat. no. 3201.0, ABS, Canberra.

ABS & Centre for Aboriginal Economic Policy Research (ABS/CAEPR) 1997, *National Aboriginal and Torres Strait Islander Survey 1994: Torres Strait Islanders in Queensland*, ABS, Canberra.

Australian Institute of Criminology (AIC) 1982-1993, *Australian Prisoners*, AIC, Canberra.

AIC 1994, *National Police Custody Survey 1992, Preliminary Report on Deaths in Custody, Australia No. 2*, AIC, Canberra.

Baker, J. 2001, 'The scope for reducing Indigenous imprisonment rates', *Crime and Justice Bulletin*, no. 55, NSW Bureau of Crime Statistics and Research, Sydney.

Borland, J. & Hunter, B.H. 2000, 'Does crime affect employment status?—the case of Indigenous Australians', *Economica*, vol. 67, no. 1, pp. 123-144.

Brady, M. 2000, 'Alcohol policy issues for Indigenous people in the United States, Canada, Australia and New Zealand', *Contemporary Drug Problems*, vol. 27 (Fall), pp. 435–509.

Broadhurst, R. 1997, 'Aborigines and crime in Australia', *Crime and Justice*, vol. 21, pp. 407-468.

Broadhurst, R., Ferrante, A., Loh, N., Reidpath, D. & Harding, R.W. 1994, *Aboriginal Contact with the Criminal Justice System in Western Australia: A Statistical Profile*, Crime Research Centre, University of Western Australia, Perth.

Carcach, C.A. & Mukherjee, S.K. 1996, 'Law, justice, indigenous Australians and the NATSIS: Policy relevance and statistical needs', in *The 1994 National Aboriginal and Torres Strait Islander Survey: Findings and Future Prospects, CAEPR Research Monograph No. 11*, eds J.C. Altman and J. Taylor, CAEPR, Canberra.

Commonwealth of Australia 1991, *Recommendations of the Royal Commission into Aboriginal Deaths in Custody*, AGPS, Canberra.

Commonwealth of Australia 1997, *Bringing Them Home: National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from their Families*, Human Rights and Equal Opportunity Commission, Sydney.

Cunneen, C. 2001, *Conflict, Politics and Crime: Aboriginal Communities and the Police*, Allen and Unwin, Sydney.

Cunneen, C. & McDonald, D. 1997, *Keeping Aboriginal and Torres Strait Islander People Out of Custody: An Evaluation of the Implementation of the Recommendations of the Royal Commission in Aboriginal Deaths in Custody*, ATSIC, Canberra.

Daly, A.E. 1995, *Aboriginal and Torres Strait Islander People in the Australian Labour Market*, Cat. no. 6253.0, ABS, Canberra.

Dawes, G. 2000, *Break On Through: Indigenous Youth Subcultures and Education*, Centre for Social Research, James Cook University, Townsville.

Drugs and Crime Prevention Committee 2000, _Inquiry into Public Drunkenness_, Parliament of Victoria, Melbourne.

Easteal, P.W. 1993, _Killing the Beloved: Homicide between Adult Sexual Intimates_, AIC, Canberra.

Ferrante, A. & Loh, N. 1996, 'Crime and Justice Statistics for Western Australia: 1994', mimeo, Crime Research Centre, University of Western Australia, Perth.

Freeman, R. 1994, Crime and the Job Market, _NBER Working Paper no. 4910_, National Bureau of Economic Research, Cambridge, Massachusetts.

Gray, D., Saggers, S., Sputore, B. & Burbon, D. 2000, 'What works? A review of evaluated alcohol misuse interventions among Aboriginal Australians', _Addictions_, vol. 95, no.1, pp. 11-22.

Gray, M.C., Hunter, B.H. & Taylor, J. 2001, Health Expenditure, Income and Health Status Among Indigenous and Other Australians, unpublished report, Australian Institute of Health and Welfare, and CAEPR, Canberra.

Greene, W. H. 1997, _Econometric Analysis_, Prentice Hall, New Jersey.

Greene, W. H. 2000, _Econometric Analysis_, Prentice Hall, New Jersey.

Groome, H. & Hamilton, A. 1995, _Meeting the Educational Needs of Aboriginal Adolescents_, Commissioned Report No 35, AGPS, National Board of Employment, Education and Training, Canberra.

Hunter, B.H. & Borland, J. 1999, 'The effect of the high rate of Indigenous arrest on employment prospects', _Crime and Justice Bulletin_, no. 45, NSW Bureau of Crime Statistics and Research, Sydney.

Hunter, B.H. 1999, 'Three nations, not one: Indigenous and other Australian poverty', _CAEPR Working Paper No. 1_, CAEPR, ANU, Canberra.

Hunter, B.H. 2000a, 'The social costs of Indigenous unemployment', _Economic and Labour Relations Review_, vol. 11, no. 2, pp. 213-232.

Hunter, B.H. 2000b, 'Social exclusion, social capital and Indigenous Australians: measuring the social costs of unemployment', _CAEPR Discussion Paper No. 204_, CAEPR, ANU, Canberra.

Hunter, B.H. 2001a, 'Some statistical models of the incidence and number of arrests among Indigenous Australians', _CAEPR Working Paper No. 10_, CAEPR, ANU, Canberra.

Hunter, B.H. 2001b, 'Tackling poverty among Indigenous Australians', in _Creating Unequal Futures_, eds R. Fincher & P. Saunders, Allen and Unwin, Sydney.

Hunter, B.H. & Gray, M.C. 1999, 'Further investigations into Indigenous labour supply: what discourages discouraged workers?', _CAEPR Working Paper No. 2_, CAEPR, ANU, Canberra, website <http://charlotte.anu.edu.au/caepr/>.

Hunter, B.H. & Gray, M.C. 2001, 'Analysing recent changes in Indigenous and non Indigenous Australians income: a synthetic panel approach', _Australian Economic Review_, vol. 34 no. 2, pp. 135-154.

Hunter, B.H. & Schwab, R.G. 1998, 'The determinants of Indigenous educational outcomes', _CAEPR Discussion Paper No. 160_, CAEPR, ANU, Canberra.

Hunter, B.H. and Taylor, J. 2001. 'The reliability of Indigenous employment estimates', _Agenda_, vol. 8, no. 2, pp. 113-128.

Johnston, J. & DiNardo, J. 1997, *Econometric Methods*, McGraw-Hill, New York.

Martin, D.F. 1998, 'The supply of alcohol in remote Aboriginal communities: Potential policy directions from Cape York', *CAEPR Discussion Paper No. 162*, CAEPR, ANU, Canberra.

Martin, D.F. 2001, 'Is welfare dependency 'welfare poison'? An assessment of Noel Pearson's proposals for Aboriginal welfare reform', *CAEPR Discussion Paper No. 213*, CAEPR, ANU, Canberra.

Mitchell, D. 1991, *Income Transfers in Ten Welfare States*, Avebury, Sydney.

Murdoch, D., Pihl, R.O. & Ross, D. 1990, 'Alcohol and crimes of violence: Present issues', *The International Journal of the Addictions*, vol. 25, no. 9, pp. 1065-1081.

National Crime Prevention (NCP) 1999, *Pathways to Prevention: Developmental and Early Intervention Approaches to Crime in Australia*, NCP, Attorney-General's Department, Canberra.

NCP 2001, *Violence in Indigenous Communities*, National Crime Prevention, Attorney-General's Department, Canberra.

Nunes Dinis, M.C. & Weisner, C. 1997, 'Gender differences in the relationship of alcohol and drug use to criminal behavior in a sample of arrestees', *American Journal of Drug and Alcohol Abuse*, vol. 23, no 1, pp. 129-141.

Office of Evaluation and Audit 1997, *Evaluation of the Community Development Employment Projects Program: Final Report*, ATSIC, Canberra.

Pearson, N. 2000, *Our Right to Take Responsibility*, Noel Pearson and Associates, Cairns.

Poole, F.J.P. 1986, 'Personal control, social responsibility and image of the person and self among the Bimin-Kuskusmin of Papua New Guinea', *International Journal of Law and Psychiatry*, vol. 9, pp. 295-319.

Ramsay, M. 1996, 'The relationship between alcohol and crime', *Research Bulletin*, vol. 38/96, pp. 37–43.

Reynolds, H. 1982, *The Other Side of the Frontier*, Penguin, Ringwood.

Ross, K. 1999, *Occasional Paper: Population Issues, Indigenous Australians*, Cat. no. 4708.0, ABS, Canberra.

Taylor, J. & Bell, M. 1996, 'Mobility among Indigenous Australians', in *Population Shift: Mobility and Change in Australia*, eds P.L. Newton and M. Bell, AGPS, Canberra.

Taylor, J. & Hunter, B.H. 1996, 'Indigenous participation in labour market and training programs', *CAEPR Discussion Paper No. 108*, CAEPR, ANU, Canberra.

Taylor, J. & Hunter, B.H. 2001, 'Demographic challenges to the future of CDEP', in *The Indigenous Welfare Economy and the CDEP Scheme, CAEPR Research Monograph No. 20*, eds F. Morphy & W. Sanders, CAEPR, Canberra.

White, H.R. & Hansell, S. 1996, 'The moderating effects of gender and hostility on the alcohol aggression relationship', *Journal of Research in Crime and Delinquency*, vol. 33, no. 4, pp. 450-470.

Williams, P. 2001, 'Deaths in custody: 10 years on from the Royal Commission', *Trends and Issues in Crime and Criminal Justice No. 203*, AIC, Canberra.

APPENDIX

MODELLING ARREST AMONG ALL NATSIS RESPONDENTS

Table A1: Variable definitions in alphabetical order

Variable name	Description
Dependent variables	
ARRESTED	Whether arrested in previous five years
ASSAULT	Last arrest for assault
DRINKARR	Last arrest for drink driving or public drunkenness
THEFT	Last arrest for theft
Explanatory variables	
AGE1317	Aged between 13 and 17
AGE2534	Aged between 25 and 34
AGE3544	Aged between 35 and 44
AGE45P	Aged 45 years and over
ARRESTOH	Other household members arrested in last 5 years
CAPCITY	Live in a capital city
CDEP	Work in a Community Development Employment Projects scheme
CROWDEDH	An average of more than 2 persons per bedroom in the house
DEPENDTS	Living in family with at least one dependant
DRINK	A person has drunk alcohol at least once in lifetime
HEALTH	Has had a health problem for more than 6 months
HOUSEOK	Household utilities (including electricity, gas, water, sewerage, running water, toilets and bathroom) are both available and working
INDIGPOL	Indigenous police aides/liaison officers in community
INDPOLNS	Question about Indigenous police aides not completed
MIXEDF	Lives in family with non Indigenous persons
NEARPOL	Lives within 50 kilometres of police station
NILF	Not in the labour force
REMOTE	Lives in rural non remote area (less than 100 kilometres from a TAFE institution)
RURAL	Lives in a rural or remote area (more than 100 kilometres from a TAFE institution)
SCHNSNA	Question about highest level of schooling completed either not stated or not applicable
SEX	Male
TAKEN	Taken away from natural family
TSI	Torres Strait Islander
UNEMP	Unemployed
VICTIM	Victim of crime (physically attacked or verbally threatened)
VOTEDOH	Other household members voted in either recent Federal, State or ATSIC election
YEAR1011	Highest level of schooling completed—year 10 or 11
YEAR12	Completed year 12 schooling
YEAR6TO9	Highest level of schooling completed—years 6 to 9
Variables used only in preliminary analysis because not significant, at 5% level, in any regression	
HINCMISS	Income data not available for all household members
POORHH	Household income less than 50% of estimated median of OECD equivalent household income from the 1994–95, Survey of Income and Housing Costs
QNONE	No post school qualification
STILLSCH	Still at school

Table A2: Average values of variables used in regression, NATSIS respondents aged 13 years and over in 1994

	Females	Males	Aged 13 to 17	Aged 18 & over	All respondents
Dependent variables					
ARRESTED	0.092	0.258	0.076	0.191	0.170
DRINKARR	0.048	0.150	0.012	0.114	0.096
ASSAULT	0.016	0.045	0.009	0.034	0.030
THEFT	0.009	0.041	0.039	0.020	0.024
OUTSWARR	0.011	0.043	0.008	0.030	0.026
Explanatory variables					
SEX	0.000	1.000	0.529	0.460	0.472
TSI	0.070	0.073	0.066	0.073	0.072
AGE1317	0.160	0.200	1.000	0.000	0.179
AGE2534	0.262	0.248	0.000	0.311	0.256
AGE3544	0.172	0.163	0.000	0.204	0.168
AGE45P	0.205	0.203	0.000	0.249	0.204
CAPCITY	0.128	0.116	0.146	0.117	0.122
RURAL	0.166	0.188	0.202	0.171	0.176
REMOTE	0.226	0.244	0.187	0.245	0.235
INDIGPOL	0.507	0.481	0.408	0.514	0.495
INDPOLNS	0.208	0.230	0.300	0.200	0.218
NEARPOL	0.852	0.838	0.879	0.838	0.845
CDEP	0.077	0.149	0.042	0.126	0.111
UNEMP	0.144	0.214	0.090	0.196	0.177
NILF	0.613	0.408	0.830	0.448	0.516
YEAR6TO9	0.335	0.343	0.102	0.390	0.339
YEAR1011	0.320	0.274	0.113	0.338	0.298
YEAR12	0.066	0.048	0.010	0.067	0.057
SCHNSNA	0.016	0.011	0.001	0.016	0.014
DRINK	0.628	0.780	0.269	0.794	0.700
VICTIM	0.114	0.111	0.099	0.115	0.112
HEALTH	0.381	0.303	0.230	0.368	0.344
MIXEDF	0.177	0.182	0.241	0.166	0.180
DEPENDTS	0.540	0.425	0.414	0.501	0.485
TAKEN	0.073	0.070	0.026	0.082	0.072
CROWDEDH	0.334	0.347	0.385	0.330	0.340
HOUSEOK	0.772	0.764	0.790	0.763	0.768
ARRESTOH	0.277	0.299	0.454	0.251	0.287
VOTEDOH	0.430	0.469	0.277	0.486	0.449
Number of observations	**5,402**	**4,833**	**1,832**	**8,403**	**10,235**

Note: The descriptive statistics are unweighted and consequently only reflect the characteristics of the NATSIS sample used in the regression analysis.

Table A3: Regression estimates of arrest by broad age groups

Variables	Aged 13 to 17 years		Aged 18 years and over	
	Coef.	Std Error	Coef.	Std Error
SEX	0.780*	0.118	0.731*	0.041
TSI	-0.632*	0.315	-0.667*	0.098
AGE2534	NA	NA	-0.026	0.047
AGE3544	NA	NA	-0.319*	0.056
AGE45P	NA	NA	-0.724*	0.066
CAPCITY	0.426*	0.145	0.176*	0.060
RURAL	-0.192	0.156	-0.226*	0.056
REMOTE	-0.373	0.207	-0.253*	0.064
INDIGPOL	-0.056	0.126	-0.094*	0.044
INDPOLNS	-0.414*	0.149	-0.560*	0.064
NEARPOL	0.099	0.220	-0.290*	0.069
CDEP	0.008	0.277	0.416*	0.067
UNEMP	0.264	0.233	0.628*	0.054
NILF	0.199	0.224	0.279*	0.056
YEAR6TO9	0.798*	0.153	0.467*	0.068
YEAR1011	0.299	0.184	0.309*	0.073
YEAR12	0.298	0.413	0.034	0.103
SCHNSNA	NA	NA	0.544*	0.158
DRINK	0.923*	0.121	0.980*	0.075
VICTIM	0.308*	0.148	0.524*	0.050
HEALTH	0.127	0.122	0.145*	0.041
MIXEDF	-0.591*	0.132	-0.086	0.054
DEPENDTS	-0.006	0.117	-0.057	0.043
TAKEN	0.514*	0.244	0.239*	0.061
CROWDEDH	0.190	0.124	0.138*	0.043
HOUSEOK	-0.413*	0.127	-0.138*	0.045
ARRESTOH	-0.030	0.107	0.238*	0.042
VOTEDOH	-0.144	0.126	-0.085*	0.042
CONSTANT	-2.336*	0.359	-2.158*	0.147
Pseudo R^2	0.290		0.237	
Log Likelihood	-351		-3,124	
Number of observations	1,830		8,403	

Note: Heteroscedasticity robust standard errors used. An asterisk denotes that a statistic is significantly different from zero at the 5 per cent level. The variable SCHNSNA and two observations were dropped from the regression for minors because both were both arrested and hence this predicts the model perfectly if included.

Table A4: Regression estimates of arrest among Indigenous males

Variables	ARRESTED		DRINKARR		ASSAULT		THEFT	
	Coef.	Std Error	Coef.	Std Error	Coef.	Std Error	Coef.	Std Error
TSI	-0.656*	0.113	-0.699*	0.137	-0.320	0.199	-0.734*	0.272
AGE1317	-0.329*	0.094	-0.949*	0.147	-0.281	0.156	0.443*	0.136
AGE2534	-0.032	0.063	0.122	0.069	0.096	0.091	-0.280*	0.101
AGE3544	-0.402*	0.074	-0.076	0.081	-0.344*	0.117	-0.999*	0.163
AGE45P	-0.824*	0.082	-0.450*	0.090	-0.432*	0.129	-1.304*	0.218
CAPCITY	0.160*	0.074	-0.010	0.091	-0.063	0.120	0.046	0.117
RURAL	-0.241*	0.068	-0.177*	0.077	-0.420*	0.120	-0.426*	0.123
REMOTE	-0.331*	0.076	-0.196*	0.084	-0.228*	0.116	-0.517*	0.132
INDIGPOL	-0.115*	0.054	-0.101	0.060	-0.156*	0.081	-0.076	0.090
INDPOLNS	-0.609*	0.073	-0.539*	0.090	-0.462*	0.128	-0.445*	0.131
NEARPOL	-0.255*	0.079	-0.365*	0.087	-0.140	0.119	-0.199	0.144
CDEP	0.401*	0.077	0.315*	0.085	0.269*	0.118	-0.079	0.148
UNEMP	0.595*	0.064	0.384*	0.072	0.299*	0.096	0.349*	0.113
NILF	0.291*	0.074	0.146	0.084	0.049	0.122	0.309*	0.136
YEAR6TO9	0.507*	0.077	0.245*	0.088	0.489*	0.138	0.760*	0.145
YEAR1011	0.364*	0.082	0.192*	0.096	0.323*	0.148	0.390*	0.156
YEAR12	-0.039	0.127	-0.085	0.148	0.075	0.229	0.315	0.221
SCHNSNA	0.425	0.217	0.230	0.228	-0.187	0.446	0.395	0.484
DRINK	0.927*	0.083	1.346*	0.181	0.549*	0.155	0.614*	0.132
VICTIM	0.562*	0.065	0.469*	0.069	0.311*	0.087	0.268*	0.100
HEALTH	0.161*	0.052	0.090	0.058	0.185*	0.079	-0.009	0.088
MIXEDF	-0.150*	0.064	-0.115	0.077	-0.075	0.103	-0.226*	0.113
DEPENDTS	0.002	0.051	-0.037	0.058	0.049	0.083	-0.163	0.087
TAKEN	0.330*	0.080	0.207*	0.085	0.197	0.117	0.182	0.149
CROWDEDH	0.106*	0.052	0.181*	0.057	0.092	0.081	0.082	0.088
HOUSEOK	-0.248*	0.056	-0.064	0.062	-0.083	0.083	-0.363*	0.087
ARRESTOH	0.230*	0.051	0.189*	0.059	0.178*	0.077	0.174*	0.080
VOTEDOH	-0.082	0.050	-0.101	0.057	0.119	0.078	-0.008	0.082
CONSTANT	-1.289*	0.166	-2.041*	0.237	-2.356*	0.276	-2.017*	0.282
Pseudo R^2	0.226		0.203		0.147		0.206	
Log Likelihood	-2,137		-1,628		-756		-651	

Note: Heteroscedasticity robust standard errors used. An asterisk denotes that a statistic is significantly different from zero at the 5 per cent level.

Table A5: Regression estimates of arrest among Indigenous females

Variables	ARRESTED Coef.	Std Error	DRINKARR Coef.	Std Error	ASSAULT Coef.	Std Error	THEFT Coef.	Std Error
TSI	-0.620*	0.161	-0.403*	0.194	-0.337	0.256	-0.161	0.342
AGE1317	-0.298*	0.124	-0.522*	0.186	-0.304	0.237	0.504*	0.236
AGE2534	-0.025	0.071	0.001	0.089	-0.042	0.116	-0.162	0.148
AGE3544	-0.228*	0.085	-0.098	0.103	-0.288	0.147	-0.843*	0.259
AGE45P	-0.600*	0.105	-0.455*	0.127	-0.813*	0.215	-0.860*	0.372
CAPCITY	0.265*	0.082	0.218*	0.109	0.045	0.137	0.388*	0.165
RURAL	-0.207*	0.088	-0.117	0.106	-0.210	0.150	-0.088	0.189
REMOTE	-0.159	0.100	0.026	0.117	-0.080	0.183	-0.276	0.234
INDIGPOL	-0.044	0.065	-0.105	0.078	-0.170	0.100	-0.413*	0.140
INDPOLNS	-0.426*	0.094	-0.672*	0.132	-0.410*	0.156	-0.341	0.202
NEARPOL	-0.273*	0.112	-0.200	0.129	-0.085	0.209	-0.055	0.263
CDEP	0.404*	0.125	0.523*	0.148	-0.038	0.229	0.333	0.358
UNEMP	0.658*	0.097	0.618*	0.124	0.366*	0.161	0.593*	0.273
NILF	0.329*	0.090	0.363*	0.116	0.156	0.152	0.364	0.255
YEAR6TO9	0.402*	0.097	0.273*	0.125	0.340	0.182	0.619*	0.253
YEAR1011	0.179	0.103	0.014	0.134	-0.031	0.198	0.513*	0.247
YEAR12	0.090	0.144	-0.065	0.183	-0.011	0.268	0.044	0.428
SCHNSNA	0.599*	0.204	0.526*	0.255			0.959*	0.480
DRINK	0.965*	0.087	1.413*	0.147	0.785*	0.190	0.569*	0.207
VICTIM	0.440*	0.071	0.343*	0.087	0.381*	0.110	0.294*	0.145
HEALTH	0.109	0.057	0.044	0.074	0.255*	0.096	0.092	0.124
MIXEDF	-0.187*	0.082	-0.238*	0.108	0.100	0.128	-0.502*	0.211
DEPENDTS	-0.095	0.065	-0.155*	0.079	-0.120	0.118	0.372*	0.149
TAKEN	0.176	0.091	-0.060	0.119	-0.056	0.161	0.285	0.193
CROWDEDH	0.197*	0.066	0.194*	0.079	0.214*	0.118	0.239	0.134
HOUSEOK	-0.045	0.069	-0.053	0.083	0.025	0.122	0.246	0.177
ARRESTOH	0.152*	0.061	0.231*	0.073	0.115	0.101	0.194	0.145
VOTEDOH	-0.064	0.063	0.004	0.079	0.080	0.104	0.027	0.141
CONSTANT	-2.229*	0.212	-2.978*	0.286	-2.899*	0.392	-3.887*	0.492
Pseudo R^2	0.190		0.204		0.161		0.195	
Log Likelihood	-1,342		-822		-381		-213	

Note: Heteroscedasticity robust standard errors used. An asterisk denotes that a statistic is significantly different from zero at the 5 per cent level. The variable SCHNSNA and 86 observations were dropped from the assault regression because they would predict the model perfectly if included.

Table A6: Regression estimates of Indigenous arrest, 1994

Variables	ARRESTED Coef.	Std Error	DRINKARR Coef.	Std Error	ASSAULT Coef.	Std Error	THEFT Coef.	Std Error
SEX	0.738*	0.038	0.606*	0.045	0.402*	0.063	0.706*	0.076
TSI	-0.660*	0.094	-0.616*	0.115	-0.318	0.162	-0.576*	0.230
AGE1317	-0.294*	0.074	-0.808*	0.120	-0.284*	0.131	0.428*	0.117
AGE2534	-0.030	0.047	0.074	0.054	0.045	0.071	-0.242*	0.083
AGE3544	-0.323*	0.056	-0.082	0.063	-0.321*	0.093	-0.969*	0.138
AGE45P	-0.736*	0.065	-0.451*	0.073	-0.553*	0.110	-1.220*	0.189
CAPCITY	0.209*	0.055	0.076	0.070	-0.011	0.091	0.164	0.096
RURAL	-0.222*	0.053	-0.151*	0.062	-0.340*	0.095	-0.326*	0.104
REMOTE	-0.268*	0.061	-0.126	0.069	-0.180	0.099	-0.449*	0.112
INDIGPOL	-0.089*	0.041	-0.104*	0.047	-0.153*	0.063	-0.164*	0.076
INDPOLNS	-0.539*	0.058	-0.580*	0.074	-0.453*	0.101	-0.401*	0.113
NEARPOL	-0.266*	0.065	-0.318*	0.073	-0.118	0.104	-0.180	0.123
CDEP	0.393*	0.065	0.344*	0.072	0.215*	0.103	0.026	0.135
UNEMP	0.603*	0.053	0.430*	0.061	0.308*	0.083	0.391*	0.102
NILF	0.281*	0.054	0.176*	0.063	0.081	0.091	0.336*	0.110
YEAR6TO9	0.484*	0.060	0.257*	0.072	0.415*	0.112	0.725*	0.124
YEAR1011	0.305*	0.064	0.124	0.077	0.175	0.121	0.439*	0.130
YEAR12	0.042	0.096	-0.086	0.115	0.036	0.176	0.263	0.194
SCHNSNA	0.545*	0.154	0.376*	0.176	-0.375	0.405	0.672*	0.358
DRINK	0.935*	0.060	1.362*	0.116	0.681*	0.117	0.591*	0.114
VICTIM	0.501*	0.047	0.410*	0.054	0.337*	0.068	0.269*	0.081
HEALTH	0.138*	0.038	0.076	0.046	0.212*	0.061	0.040	0.073
MIXEDF	-0.156*	0.050	-0.149*	0.062	-0.013	0.082	-0.304*	0.098
DEPENDTS	-0.044	0.040	-0.079	0.047	-0.010	0.068	-0.033	0.071
TAKEN	0.257*	0.059	0.114	0.068	0.112	0.093	0.213	0.119
CROWDEDH	0.142*	0.041	0.187*	0.047	0.139*	0.067	0.108	0.075
HOUSEOK	-0.165*	0.043	-0.057	0.050	-0.044	0.069	-0.211*	0.076
ARRESTOH	0.199*	0.039	0.202*	0.046	0.147*	0.062	0.183*	0.070
VOTEDOH	-0.070	0.039	-0.057	0.046	0.110	0.063	0.000	0.070
CONSTANT	-2.108	0.133	-2.715*	0.177	-2.830*	0.228	-2.953*	0.245
Pseudo R^2	0.252		0.236		0.167		0.229	
Log Likelihood	-3,496		-2,471		-1,146		-884	

Note: Heteroscedasticity robust standard errors used. An asterisk denotes that a statistic is significantly different from zero at the 5 per cent level. The coefficients for the analysis of outstanding warrants are omitted because of lack of space, but are available on request.