Further explorations of the role of crime in Indigenous employment status

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Abstract

Undertaking econometric modelling using samples from small populations such as Indigenous Australians, is difficult because of the data constraints facing both the researcher and the data collection agency. This paper uses the ABS’s Remote Access Data Laboratory to analyse an expanded unit record file that is only available in this form. The following analysis of the 2002 National Aboriginal and Torres Strait Islander Survey illustrates how expanded unit record files can be used to replicate and extend existing research. In addition to confirming earlier research, the crucial importance of the early interactions with the criminal justice for perpetrating Indigenous employment disadvantage is also highlighted.

1. Introduction

The over-representation of Indigenous Australians in prison continues to be a serious problem, more than 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 the over-representation stems initially from the higher rate of appearance at court by Indigenous Australians, 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 some Indigenous people are convic ted and the greater likelihood of Indigenous persons having prior convictions were also found to contribute to their higher rate of imprisonment.

Borland and Hunter’s (2000) analysis of the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) shows that interactions with the criminal justice

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\(^1\) 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.

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system are an important factor underlying Indigenous disadvantage in employment. For example, differences in arrest rates between Indigenous and non-Indigenous Australians may explain over 20 per cent of the difference in employment/population rates between those groups. Hunter (2005) use the parameter estimates in Borland and Hunter’s analysis to show that crime is an even more potent explanation of the job deficit for Maoris vis-à-vis other New Zealanders.

The 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) offers the opportunity to replicate and extend Borland and Hunter’s (2000). The 2002 NATSISS, like the 1994 NATSIS before it, is an omnibus survey designed to provide a broad range of information across key areas of social concern and is ideal for exploring inter-relationships between these socioeconomic factors and crime and justice issues. It is also possible to identify broad trends in crime and justice issues—although the scope for any time series analysis is diminished by the removal and addition of questions between the 1994 and 2002 surveys. For example, no information was collected in 2002 as to whether an offence was for theft, assault, disorderly conduct and/or drink driving, and outstanding warrants and breach of orders. Consequently, it is not possible to replicate this aspect of the earlier research.

However, 2002 NATSISS does have two major advantages over the earlier Indigenous survey. First, the 2002 survey collects information never attempted before in a social survey context, namely: whether formally charged with an offence by police; Age first formally charged by police; and whether incarcerated in last 5 years. Second, the age first formally charged by police is potentially important as it allows us to control for long-lived historical factors that are usually difficult to assess in cross-sectional studies.

The use of the information on the age at which an Indigenous person is first charged can provide an insight into the effect of criminal history on employment, but it also highlights the difference between being arrested and being charged. In addition to the difference of the timing of the periods covered by the questions on ‘arrest’ and having been ‘charged’, there is arguably a growing disconnect between the notions of arrest and being charged. For example, the 300-year-old principle of habeas corpus, that every arrested citizen has a right to be either charged or freed, has effectively been diminished in the recent anti-terror laws (with an extension on the grounds for holding a person without being charged). For the purposes of this paper the point is that being arrested, charged and imprisoned are distinct events/concepts and the effects of these distinct events can and need to be considered separately.

The main objective of this study is therefore to seek to understand how crime and criminal history effect employment outcomes. An estimation method which allows for potential joint endogeneity between an individual’s employment outcome and arrest record is applied in the regression analysis. One strength of the 2002 NATSISS data are that they allow a relatively rich set of controls for an individual’s socioeconomic background as well as other demographic and skill characteristics to be included in a regression equation for employment status, and alternative representations of an individual’s criminal history can be tested.

In addition to replicating Borland and Hunter’s (2000) main results, this paper extends that analysis by analysing the correlation between mainstream employment
and whether charged for an offence, incarceration in the last five years, and whether
being charged as a minor. The next section provides a primer on why we should be
interested in the role of crime on employment and introduces the literature on Indigenous
employment. This includes the outline of main results in Borland and Hunter and
related studies, and then presents the model used in this paper. The following two
sections acquaint the reader with the relevant 2002 NATSISS data before the results
are presented. The concluding section reflects on the implications for policy-makers.

This paper analysed the 2002 NATSISS using the Remote Access Data
Laboratory (RADL), that is currently being developed by the Australian Bureau of
Statistics (ABS). Consequently, it is an opportune time to reflect on the sort of analysis
that is, and is not possible, using the evolving RADL. The development of the RADL
is likely to be crucially important for the future analysis of small populations where
confidentiality considerations are likely to constrain the amount of data released in
the public domain.

A Primer on Indigenous crime and employment

Revisiting the motivation: Why examine the role of crime on employment

There are a number of reasons why linkages might exist between crime and
employment. First, criminal activity may affect a person’s employment outcome. On
the demand side, a person who has been arrested and/or convicted of an offence may
be stigmatised by employers and hence be less likely to obtain employment (e.g., Dale
1976; Finn & Fontaine 1985; e.g., Schwartz & Skolnick 1962). Alternatively, employers
may be deterred from locating in regions with high levels of criminal activity and
hence there may be limited employment opportunities for persons living in those
regions. On the supply side, contact with the criminal justice system may affect a
person’s motivation to work, or perceptions of the expected benefits from seeking
employment, and hence lower the probability of employment (e.g., Becker 1963;
Thornberry & Christensen 1984). A second possibility is that a person’s employment
outcome will affect the likelihood of being arrested. For example, a response to being
unable to obtain employment may be to engage in drinking which increases the
probability of being arrested for offences relating to drunkenness (Freeman 1988).

Borland and Hunter (2000) also explore a number of potential explanations
for why effect on employment of arrest might differ by reason for most recent arrest.
One possibility is that the reason for arrest is proxying for number of arrests in the
employment equation—for example, it might be thought being arrested on an
outstanding warrant makes it more likely that a person will have been arrested on
multiple occasions and that this explains the large size of the effect on employment of
having been arrested on an outstanding warrant. However, they found it was not possible
to reject at the 10 per cent level of significance the hypothesis of equal number of
previous arrests in each reason for arrest category. Another possibility is that each
type of arrest is treated differently by employers in making hiring decisions or has a
different effect on an individual’s motivation to seek employment. On the demand
side it is difficult however to see why an employer would not take into account an
arrest for theft but would take into account arrest for drinking-related offences. Hence,
it may be that the pattern of marginal effects by reason for arrest is explained by
supply-side behaviour. For example, arrest for drinking-related offences may indicate that an individual is in an environment where lack of employment opportunities or social conditions reduces the perceived returns to seeking employment.

One way in which crime might affect employment prospects are directly through the operation of the Job Network. The Job Seeker Classification Index (JSCI), which is used to identify those unemployed persons who require particular help in finding employment or who have a stronger possibility of being part of the long term unemployed, attaches considerable weight to jobseekers who, inter alia, are indigenous or have a prison history (Giles and Le forthcoming). Therefore, if extra resources are allocated to people with a criminal history through the Job Network (and such resources enhance employment prospects), then crime might have a positive association with employment outcomes. The net effect of crime on employment is an empirical matter that will be determined by the dominant influence. However, given that JSCI is designed to mitigate labour market disadvantage, it seems reasonable to expect that the negative effect of this factor will still dominate (even if the effect is diminished).

In summary, the potential effects of criminal activity and arrests on employment outcomes of Indigenous Australians are of interest for a number of reasons. First, as indicated above, the disparity in arrest rates may explain part of the difference in employment/population rates between Indigenous and other Australians. Second, understanding the relation between an individual’s arrest record and employment outcome provides an insight into the social costs of contact with the criminal justice system for Indigenous Australians. This seems particularly important where there is a possibility that much of the contact of Indigenous Australians with the criminal justice system arises due to differences in treatment of Indigenous and non-Indigenous Australians under that system rather than differences in behaviour.2

Hunter’s (2005) comparison of Indigenous employment outcomes in Australia and New Zealand yields two main insights that are of potential relevance here. First that the Maori population is more fully integrated into the New Zealand economy and business cycle than Indigenous Australians are into the Australian economy. The second finding is that while Maori are performing very well in terms of employment growth (with recent Maori employment rates being relatively close to the estimates for the non-Maori population), the prospect for future improvements may be constrained by unresolved cultural conflict embodied in the high ongoing rates of Maori arrest. That is, the proportion of Maori employment disadvantage that was explained by their relatively high arrest rates in 2001 was around 60 per cent, more than double the estimate for 1991 (Hunter 2005). While there is probably a similar level of cultural conflict between Indigenous and other Australians, it is probable that the historical difference in the treatment of the respective Indigenous populations is partially responsible for the different economic and arrest outcomes in the two nations. Therefore the main lesson from the New Zealand experience is that, even if other economic circumstances can be addressed directly (e.g., via ‘practical reconciliation’), there are limits to what can be achieved unless the factors underlying Indigenous crime can be addressed.

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2 Broadhurst (1997: 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 stigmatizing characteristics (such as truancy, unemployment, substance abuse) and in this sense operates as a shorthand “predictive” model for police...”.
Review of studies of Indigenous employment and arrest

The earliest studies of the determinants of Indigenous employment outcomes for Australians did not consider the role of crime because they were confined to census data, which has never collected information on crime (Daly 1993; 1995; Miller 1989; Ross 1993). For example, Daly (1995) identifies age, marital status, number of dependents, educational attainment and geography as the major factors. In general, census based analysis tends to find that the collective effect of educational variables on Indigenous employment are significantly larger than either the demographic or marital status variables (Hunter 2004).

The first study to examine the effect of crime was ABS/CAEPR (1996), which used the 1994 NATSIS to examine the effects of previous arrests on the probability of employment for Indigenous Australians. This included a richer set of controls than is possible using census based analysis. The analysis of the NATSIS incorporated social environmental and cultural factors which are related to the employment status of Indigenous persons including whether a person voted in a recent election, whether they have a long-term health condition, and whether they have been arrested in the previous five years (Borland and Hunter 2000). Hunter and Borland (1997) argued that the general significance of these socio-cultural indicators means that labour economists should consider controlling for such factors wherever possible.

This study, like Borland and Hunter (2000) before it, differs from ABS/CAEPR (1996) in its use of an estimation method which allows for potential joint endogeneity between employment and arrest, the inclusion of alternative representations of the arrest variable and a broader range of potential explanatory variables for employment outcomes, and by reporting marginal effects of arrest on employment (and associated standard errors) for a range of alternative scenarios.

As well as establishing the existence of a significant negative relation between arrest and employment status, Borland and Hunter (2000) the probability of employment is found to be lower for younger and older age groups, for persons with low levels of educational attainment and training, with difficulty in speaking English or who had been arrested, and higher for persons who were married, had voted in a recent election, or were living in a mixed family. Another relevant finding is that, even after controlling for socioeconomic factors, there is a significant relation between a person’s arrest record and employment status. This suggests that the effect of arrest on employment is not simply proxying for a wider set of social influences such as a person’s health status or whether a person drinks alcohol. Furthermore, the tests of endogeneity between arrest and employment are consistent with the hypothesis that arrest is affecting employment outcomes, and not vice versa (N.B., details of the econometrics test of endogeneity are described in the next section).

The Community Development Employment Projects (CDEP) scheme is a Commonwealth Government program whereby unemployed Indigenous persons of working age forego individual entitlements to unemployment benefit payments in return for a grant to their local community council which is used to fund job creation in community development activities. Almost all extant economic analysis of Indigenous employment seeks to focus on non-CDEP employment as such employment is more likely to be responsive to variations in market forces and individual incentives. One
exception to this rule is the census-based analyses, which cannot adequately identify CDEP scheme employment in non-remote areas. However, several recent studies demonstrate that the early studies of Indigenous employment quoted above were robust even when one controlled for the incidence of CDEP using indirect criteria (Hunter 2003; Hunter 2004).

Gray and Chapman (2006) analyse the statistical problems associated with the omission in NATSISS 2002 of a good measure of labour market experience. By comparing the NATSISS results with those found using a data set with a better measure of experience (namely the Household, Income and Labour Dynamics in Australia (HILDA) Survey), they found that NATSISS 2002 understates the value of experience for wages and employment, and that this understatement becomes less as the experience measure increases. Gray and Chapman do not utilise the information in NATSISS on crime because their primary interests are in benchmarking the effect of experience measure and mounting a case for the collection of longitudinal data for Indigenous people by contrasting the results attained in HILDA and the 2002 NATSISS.

One longitudinal study that controlled for arrest were several reports prepared for the federal department that is currently called the Department of Employment and Workplace Relations, DEWR (Gray & Hunter 2000; Hunter, Gray & Chapman 2000; Hunter, Gray & Jones 2000). While those studies did confirm the analysis in Borland and Hunter in broad terms, it was confined to Indigenous jobseekers, and hence it is difficult to compare the results with any precision. Bearing in mind this caveat, a recent analysis of the determinants of job retention, based on one of the DEWR reports, found that many of the factors found to be important in increasing the likelihood of employment also increase the probability of job retention (Gray & Hunter 2005). They also found that having been arrested and having poor health significantly reduces the probability of job retention for males, but not for females.

Finally Giles and Le (forthcoming) show that adult prisoners in Western Australia tend to have better employment outcomes than other Indigenous people. Their paper argues convincingly that vocational training undertaken in prison improves their employment prospects on release. In the context of a multivariate analysis of crime and employment the education data will reflect this in the relevant parameter.

The Borland and Hunter model

Borland and Hunter (2000) examine the determinants of the employment status of Indigenous Australians using a two-equation model for employment status and criminal history:

$$y_{1it}^* = \alpha_{1i} X_{1it} + \gamma_{1i} y_{2it}^* + u_{1it}$$  \hspace{1cm} (1)

$$y_{2it}^* = \alpha_{2i} (\sum_{t-5}^{t} X_{2it}) + \gamma_{2i} (\sum_{t-5}^{t} y_{1it}^*) + u_{2it}$$  \hspace{1cm} (2)

Equation (1) specifies that the employment status of individual i in year t, $y_{1it}^*$, depends on the criminal history over the previous five years, $y_{2it}^*$, on a set of other
explanatory factors, $X_{1it}$, and on a normally distributed error term, $u_{1it}$. Equation (2) specifies that an individual’s criminal record over the previous five years depends on employment outcomes during that period, $(\sum_{r=1}^{5} y_{1ir})$, a set of other explanatory factors, $(\sum_{r=1}^{5} X_{2ir})$, and a normally distributed error term, $u_{2it}$.

As an individual’s employment outcome is observed in the 2002 NATSISS as [employed, not employed], therefore probit specifications of equation (1) are estimated. That is, a transformed dependent variable, $y_{1it}$, represented as:

\[
y_{1it} = 1 \quad \text{where } y_{1it}^* > 0
\]
\[
y_{1it} = 0 \quad \text{otherwise}
\]

which is used to estimate these equations.

Several alternative specifications of the crime variable are tested in the regression analysis. In the first set of specifications, the crime variables are included only as a single binary variable. For example, as in Borland and Hunter (2000), arrested in the previous five years is included as a dichotomous variable [arrested, not arrested]. However, several other binary variables that capture criminal history are also used including whether a respondent was: ever charged, incarcerated in the last five years and charged as a minor (i.e. aged under 18 years old). Hence probit specifications of equation (2) are estimated using a transformed variable, $y_{2it}$, represented as:

\[
y_{2it} = 1 \quad \text{where } y_{2it}^* > 0
\]
\[
y_{2it} = 0 \quad \text{otherwise}.
\]

Each of these dummy variables is included as separate explanatory variable in equation (1), and equation (2) is estimated as a set of four separate probit equations.

Equations (1) and (2) constitute a system where an individual’s employment status depends on current criminal record, and current criminal record depends on lagged employment outcomes. This structure is dictated by the type of information on criminal activity—a historical measure of outcomes of the criminal justice system—which is available from the 2002 NATSISS. However, the structure is also the appropriate representation of the relation between employment and criminal activity in circumstances where employers make hiring decisions based solely on an individual’s past criminal record, and where individuals decide on whether to engage in criminal activity in the current time period only after observing their employment outcomes in that period.

Our main interest in this study is in estimation of the equation for the determinants of employment. The structure of equations (1) and (2) might initially suggest that the model is recursive, and that therefore it is possible to estimate the employment equation independently of the criminal record equation. However, this will only be the case where the error terms in each equation, $u_{1it}$ and $u_{2it}$, are independent. To see how this condition may be violated, suppose that both the error terms in the
employment and criminal record equations depend on a fixed unobserved component. An example of a fixed unobserved factor which could affect both an individual’s criminal record and employment outcome would be unobserved characteristics of the individual’s location. Where the fixed components of the error terms are correlated so that \( \text{var}(u_{1it}, u_{2it}) \neq 0 \), estimates of \( \gamma \) will be biased, even though an individual’s criminal record was determined in time periods prior to the period in which the individual’s employment outcome is observed.

To account for possible joint endogeneity between an individual’s employment status and criminal record in equation (1) we apply a three-stage procedure. In the first stage a probit equation for whether an individual was involved with the criminal justice system is estimated. From the probit equation(s) for arrest generalised residuals are calculated as:

\[
\hat{\epsilon}_{2it} = \{y_{2it} - \Theta(Z_{2it}\hat{\beta})\phi(Z_{2it}\hat{\beta})\} \{1 - \Theta(Z_{2it}\hat{\beta})\}\Theta(Z_{2it}\hat{\beta})^{-1}
\]  

(5)

where \( \Theta \) and \( \phi \) are the cumulative distribution function and probability density function of the standard normal distribution, \( Z_{2it} \) is the set of explanatory variables included in equation (2), and \( \hat{\beta} \) is the probit estimate of coefficients on the explanatory variables in equation (2).

In the second stage a probit equation for employment status is estimated which includes as an explanatory variable (or explanatory variables) the generalised residuals from the first-stage probit procedure. Vella (1993) shows that a t-test of whether the coefficient on the generalised residual variable is equal to zero is a test of joint endogeneity (see also Vella 1992). Standard errors in the probit equation are corrected for inclusion of a generated regressor.

The third-stage estimation of the probit equation for employment proceeds according to the findings from the test of the significance of the generalised residual variable(s). Where it is not possible to reject the hypothesis of a zero coefficient on the generalised residual the employment equation can be re-estimated as a single equation excluding the generalised residual variable. Where the hypothesis of a zero coefficient on the generalised residual is rejected, it is necessary either to make additional specific assumptions on the form of the error term in equation (1) (in order to preserve normality of the error term after inclusion of the generalised residual variable) in which case the estimate of \( \gamma \) from the second-stage regression will be consistent (Rivers & Vuong 1988), or to estimate equations (1) and (2) jointly using a maximum likelihood procedure. Unfortunately, it was not possible to use maximum likelihood estimation for these equations because of the existing restrictions on the use of user-defined programs within RADL. I will discuss these extant constraints in the concluding section.

A second set of specifications involves including several dimensions of criminal record in the estimates of non-CDEP scheme employment. One basis for inclusion is that the dimensions included are conceptually and empirically independent—if nothing

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1 Any description of the various stages of the criminal justice system will vary across jurisdictions. However, imprisonment may follow a bail hearing in which the outcome is remand in custody or a trial in which the outcome is a custodial sentence. In both cases, charges will have usually been brought against the prisoner. Sometimes alleged offenders can be held in police lock-ups pending the formalisation of charges. Incarceration tends to refer to prisons, rather than lock-ups.
else, this criteria will reduce the possible for multicolinearity in the regressors. Given that almost all people who have been incarcerated have been arrested and charged, and all people who were charged as minors must have been charged by definition, the following analysis focuses on whether arrest in the last five years is still significant after one takes into account whether a person was ever charged or charged as a minor.\(^3\)

An alternative approach to control for potential joint endogeneity between an individual’s employment status and arrest record is to use longitudinal data which allows fixed unobservable factors which affect both employment and arrest record to be differenced out from the error term in the employment equation—see for example, Grogger (1992; 1995). Unfortunately, there is no suitable longitudinal data that includes information of both employment and criminal activity for Indigenous Australians over several waves. The analysis of DEWR data set of Indigenous job seekers is constrained by the fact that arrest data is only collected at one point in time (Gray & Hunter 2000; Hunter, Gray & Chapman 2000; Hunter, Gray & Jones 2000).

**Descriptive information on NATSISS data on crime and employment**

Borland and Hunter (2000) provide a reasonably comprehensive introduction to the arrest and employment data in the 1994 NATSIS. In 1994, 32 per cent of males, and 10 per cent of females, had been arrested in the last previous years (1989 to 1994). Of those arrested the average number of arrests is approximately 3.0 for males and 2.2 for females. Males in younger age groups and with lower levels of educational attainment have the highest incidence of arrest. There does not appear to be any pattern in the incidence of arrest for persons living in different regions. The most common reasons for arrest relate to drinking—23.1 per cent of males and 6.6 per cent of females had charges for drink driving or drinking in public in their most recent arrest in the previous five years.

The RADL for the 2002 NATSISS contains more disaggregated information on age and other socioeconomic data than is available to users of the Confidentialised Unit Record Files (CURFs) for the 1994 NATSIS survey. It also includes an improved geographic classification which captures accessibility an area in a more direct manner. However, this paper emphasises the importance of comparability of the results with Borland and Hunter (2000), and hence has attempted to keep the empirical specifications reasonably similar, but will highlight salient differences where necessary.

For example, the 2002 NATSISS did not collect information on the reason for their last arrest. Notwithstanding such changes, the broad trends in crime and justice issues for Indigenous Australians did not change much between 1994 and the 2002 NATSISS (Dodson & Hunter 2006). However, the latest survey does have data on incarceration and whether charged. Indeed one of the most interesting aspects of the latest survey is that it includes information on the age at which a person was first charged. The following descriptive statistics briefly examine this new data, inter alia, as a means of illustrating why it is important to explore the incidence of being charged or incarcerated (in the last 5 years) as well as the arrest record in the last five years.
Table 1 - Arrest and incarceration by age at which first charged and sex, 2002

<table>
<thead>
<tr>
<th>Age first charged (in years)</th>
<th>Aged 8–14</th>
<th>Aged 15–17</th>
<th>Aged 18–19</th>
<th>Aged 20–24</th>
<th>Aged 25–34</th>
<th>Aged 35 years &amp; over</th>
<th>Never Charged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>arrested</td>
<td>55.6</td>
<td>45.5</td>
<td>37.3</td>
<td>32.2</td>
<td>30.9</td>
<td>25.5</td>
<td>1.5</td>
</tr>
<tr>
<td>incarcerated</td>
<td>19.7</td>
<td>19.2</td>
<td>9.4</td>
<td>12.6</td>
<td>6.7</td>
<td>11.6</td>
<td>0.3</td>
</tr>
<tr>
<td>N</td>
<td>3,796</td>
<td>8,974</td>
<td>4,546</td>
<td>4,356</td>
<td>5,126</td>
<td>3,455</td>
<td>116,458</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>arrested</td>
<td>61.2</td>
<td>44.9</td>
<td>40.6</td>
<td>37.3</td>
<td>34.0</td>
<td>32.9</td>
<td>3.4</td>
</tr>
<tr>
<td>incarcerated</td>
<td>34.0</td>
<td>24.0</td>
<td>15.4</td>
<td>11.4</td>
<td>19.2</td>
<td>21.1</td>
<td>1.0</td>
</tr>
<tr>
<td>N</td>
<td>13,637</td>
<td>21,388</td>
<td>12,468</td>
<td>10,533</td>
<td>6,010</td>
<td>3,049</td>
<td>67,077</td>
</tr>
</tbody>
</table>

Notes: The population for this table are those aged 15 and over. The information on arrest and incarceration refers to the respondents experience between 1997 and 2002.
Source: Customised cross-tabulations from the 2002 NATSISS RADL

The first thing to note about table 1 is that almost none of the respondents who were never charged had been arrested in the last five years (1.5 per cent & 3.4 per cent for females and males respectively) or had been incarcerated in the last five years (0.3 per cent & 1.0 per cent for females and males respectively). While it is theoretically possible to be incarcerated (& arrested) without being charged, this table indicates that it is unlikely to occur (at least as indicated by the responses to this survey).

The converse of these observations is that among those who were arrested in the last five years, 86.7 per cent and 93.0 per cent had been charged at some time in the past (these estimates can be derived or ‘backed-out’ of table 1). Among those who were incarcerated recently, 91.4 per cent and 95.8 per cent had been charged at some time in the past. Consequently, if one knows about the recent experience of arrest and incarceration, then the information about whether someone has ever been charged does not add that much.

Notwithstanding, compared to the data on arrest and incarceration, there is considerable additional information from the information on the age at which a person was first charged, especially whether a person had been charged before their majority (attained at a person’s 18th birthday for more than 30 years in most states). For example, being charged before your 15th birthday means that females were around twice as likely to have been arrested and incarcerated as respondents who were first charged after their 35th birthday. In general, for people who were ever charged, the younger a person was when they were first charged, the higher the rates of arrest and incarceration.

The analysis of table 1 appears to point to a fruitful line of inquiry being to use the ‘quasi longitudinal’ information in the age at which a person was first charged in conjunction with more recent interactions with the criminal justice system to examine whether the importance of criminal history on employment outcomes.

Data used in the regression analysis
This study uses the 2002 NATSISS to examine the determinants of employment outcomes for Indigenous Australians. The 2002 National Aboriginal and Torres Strait
Islander Survey (NATSISS) is the second major nationwide survey specifically targeted to collect a large range of information on Indigenous Australians. Carried out between August 2002 and April 2003 it collected information from 9,359 individuals aged 15 years and over from 5,887 households. Some of the information had never before been collected for the Indigenous population, whereas a number of the variables were broadly comparable to the 1994 NATSIS, the survey used by Borland and Hunter (2000).

In essence, the NATSISS had two separate sample designs. The first was based on a sample of discrete remote Indigenous communities and the out-stations associated with them—the Community Area (CA) sample where Pen and Paper Interviewing (PAPI) techniques were used. The data from other areas are described as the Non-Community Area (NCA) sample. Respondents in NCAs were interviewed using Computer Assisted Interviewing (CAI). The CA sample was obtained from a random selection of discrete remote Indigenous communities and out-stations. Dwellings and therefore individuals in NCAs were selected using a stratified multistage area sample based on the 2001 Census. A random selection of dwellings within selected Census Collection Districts (CDs) was then screened to assess their usual residents’ Indigenous status. An insufficient number of households with Indigenous Australians were initially collected, so additional CDs were sampled during February to April 2003.

For this study a restricted sample is selected from NATSISS. Only working-age members of the population who were not in full-time schooling (15–64 years) are included. After imposing these restrictions and deleting observations for which missing values on variables included in the regression analysis exist reduces the sample to 7,671 observations. Deleting the missing observations did not significantly alter the means or proportions for the descriptive statistics of the sample used in the following analysis (see table A1).

Individuals’ observed employment outcomes will depend on the interaction of labour demand and labour supply factors. Hence, in addition to the arrest record variable, explanatory variables are included cover a range of other factors which are likely to capture both effects of labour demand and labour supply on employment. These factors can be classified as four main types of variables: skill; location; family; and socioeconomic. To capture skill factors dummy variables for: highest level of educational attainment at high school, for whether have a degree/diploma, or certificate level qualification, and for whether have difficulty in communicating with service providers were included. Locational determinants of employment status are proxied for by the broad remoteness classification from Australian Standard Geographic Classification (ASGC). Note that this geographic data is an unambiguous improvement on the part-of-state classification available in the 1994 survey, because the remoteness classification captures the accessibility to services and hence accessibility to the labour market.

Family-type variables included in the employment regression equation are dummy variables for whether a sole parent, whether there was more than one family living in the household, whether living in a mixed household (living in a household where there are both Indigenous and non-Indigenous residents), and the number of dependants. Other possible socioeconomic influences on employment status are
represented by dummy variables for whether speak an Indigenous language, whether a respondent assesses their health status as fair or poor, whether have ever drunk alcohol in the last 12 months, and whether a person engaged in high risk drinking.

Appendix Table A1 reports all the summary statistics for the explanatory variables used in the regression analysis. A conscious attempt was made to keep some symmetry between the variables used in Borland and Hunter (2000) with those used in this study. Unfortunately, this was not always possible. In addition to the use of an improved geographic information, specification of explanatory variables changed where the ABS provided data in a different form (e.g., 2002 question specified whether a person had drunk alcohol in the last 12 months rather than whether a person ever drunk alcohol). The following analysis either dropped variables where there was no analogous information in the 2002 NATSISS (e.g. whether voted at last election) or added variables where new data became available (e.g. self-assessed health status or high risk drinking.). Another category of changes is where the quality of the data was deemed to be too poor to use or the coverage of information was incomplete (Altman, Buchanan & Biddle 2006).

The criminal record variables represent a summary of crime outcomes in previous time periods. Hence, it is a function of lagged values of explanatory variables going back five years (as specified in equation 2) or more. Unfortunately information on explanatory variables in previous time periods is not available from the 2002 NATSISS so that it is necessary to include explanatory variables from the current time period to proxy for effects from previous time periods. Explanatory variables included in the crime equation are the set of variables from the employment equations plus some variables that were not significantly correlated with employment (after other explanatory variables are taken into account). As in Borland and Hunter the main identifying instrument was whether a person was taken from 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: 12–6). Sometimes another instrument was required to identify the estimates of equations (1) and (2): whether there was more than one family living in a household. The rational for this instrument will be discussed later, but it is likely to be correlated with contemporaneous (and perhaps historical) levels of family stress.

For some variables which are relatively ‘permanent’—such as age, educational attainment, whether taken from natural family, and whether drink 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. It should be noted though that our primary objective in estimating equation (2) is to control for potential joint endogeneity between crime and employment status, rather than to seek to interpret the coefficient estimates in that regression. To undertake the latter task of explaining the criminal record, it would be necessary to take proper account of the wide range of theoretical work on the determinants of criminal activity (see e.g., Broadhurst 1997: 413–5).

Before moving to the main results, it is worth discussing the summary statistics
for the dependent variables used in the regression analysis (see Appendix Table A1). The proportion of males and females employed is similar to those reported for the population at 26.9 per cent and 32.9 per cent for females and males respectively.

Four alternative representations of criminal history were introduced as a series of dummy variables, whether a person was: arrested in the last five years, ever charged, incarcerated in the last five years, or charged as a minor. Around one-tenth of females and just under one-quarter of males were arrested in the last five years. A similar number were charged before their 18th birthday, although they were a very different group of respondents to those who were recently arrested (see table 1). Twice as many respondents were charged at some time in the past (22.4 per cent & 51.7 per cent respectively). Substantially fewer respondents were incarcerated in the last five years (3.0 per cent & 11.8 per cent respectively for females and males).

**Discussion of results**

Regression results for the coefficient estimates are fully reported in Hunter (2006, available through http://esam06.anu.edu.au/). Rather than revisit all the results reported in earlier studies, which are basically confirmed in estimates presented in that paper, this section focuses on identifying the magnitude and significance of marginal effect of the various Indigenous interactions with the criminal justice system in non-CDEP scheme employment.

The initial specification of the employment equation includes the generalised residual variable. For both males and females this variable is found to be insignificant at the 5 per cent level in almost all regressions. The one possible exception is for the female estimates of the effect of arrest on employment.4

It is generally not possible to reject the hypothesis of no joint endogeneity between employment and Indigenous crime. As is often the case with this type of procedure there is some evidence of multicollinearity between the generalised residual and other explanatory variables—in particular standard errors on the arrest variable are affected by inclusion of the generalised residual. Consequently, the marginal effect of crime variables reported in tables 2 and 3 are based on regressions where the generalised residual is not included in the specification. Note that this change in specification does not substantially alter coefficients for the non-crime variables which are very robust.

Before analysing the marginal effects of the crime variables, it is necessary to reassure the reader that the instruments for arrest were valid (correlated with arrest) and separately identified from employment (not correlated to employment). While the formal tests were conducted, ‘IV etiquette’ would emphasize the importance of giving a plausible story for the first stage estimates. As in Borland and Hunter (2000), the primary instrument for crime was whether an individual was ‘taken’ from their natural family. While the effect of this variable could be argued to be a result of the ‘stolen generation’, it is impossible to discount the possibility that it reflects family disruption (Hunter 2001).

4 If the female respondent was arrested but was not predicted to be arrested, then she was more likely to be employed than other respondents.
Borland and Hunter (2000) used other instruments where necessary, derived from the distance from a police station and access to legal services. However, these variables were not available in the 2002 NATSISS and a supplementary instrument was found in the variable, lives in a household with several families. It is not difficult to rationalise this variable as capturing another dimension of family disruption, albeit a more contemporaneous dimension than the ‘taken’ variable. Consequently, we can be reasonably confident that the instruments derived from the first stage are uncorrelated with unobserved determinants of the dependent variable, employment.

Table 2 - Marginal effect of involvement in criminal justice system on the probability of Indigenous employment (in percentage points)

<table>
<thead>
<tr>
<th></th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrested in last 5 years</td>
<td>-16.1</td>
<td>-20.1</td>
</tr>
<tr>
<td></td>
<td>(1.7)</td>
<td>(1.9)</td>
</tr>
<tr>
<td>Ever charged</td>
<td>-11.2</td>
<td>-14.3</td>
</tr>
<tr>
<td></td>
<td>(1.5)</td>
<td>(1.9)</td>
</tr>
<tr>
<td>Charged as a minor</td>
<td>-13.2</td>
<td>-17.5</td>
</tr>
<tr>
<td></td>
<td>(2.4)</td>
<td>(2.0)</td>
</tr>
<tr>
<td>Incarcerated in last 5 years</td>
<td>-13.3</td>
<td>-14.9</td>
</tr>
<tr>
<td></td>
<td>(2.0)</td>
<td>(2.0)</td>
</tr>
</tbody>
</table>

Notes: The marginal effects in this table are reported from specifications that do not include the generalised residual. The standard errors are reported in parentheses.

The first thing to note about table 2 is that the marginal effects for the arrest record are not significantly different from the overall effects estimated in Borland and Hunter (2000) of 13.1 and 18.3 percentage points for females and males respectively. The second stylised fact to emerge is that the effect of the arrest is often significantly higher than it is for the other crime variables. For example, the effect of being ever charged is more than two standard errors less that the marginal effects for arrest in Table 2. The prima facie evidence is that the experience of arrest is most strongly correlated with the factors constraining Indigenous employment outcomes. Given that the incidence of arrest in the last five years and being charged refers to a different group of respondents, table 3 explores whether the these marginal effects are cumulative rather than capturing the same, or rather similar, effects.

Table 3 shows that once one conditions for arrest in the last five years, the effect of other events on the criminal record tend to be significantly lower. This pattern was also observed for incarceration in the last five years, but there was evidence of collinearity between arrest and that variable so this result is not reported. The converse of this observation is that the marginal effect of arrest does not change significantly by the inclusion of other aspects of criminal history. Consequently, the findings of Borland and Hunter (2000) are robust. If anything that paper could be said to provide a conservative estimate of the effect of criminal history on Indigenous employment outcomes.
Further explorations of the role of crime in Indigenous employment status

Table 3 - Marginal effects when two crime variables included in regression simultaneously (in percentage points)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Arrested in last 5 years</th>
<th>Ever charged</th>
<th>Charged as minor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrested and ever charged</td>
<td>-12.8 (-2.2)</td>
<td>-7.4 (1.7)</td>
<td></td>
</tr>
<tr>
<td>Arrested and charged as a minor</td>
<td>-14.4 (1.9)</td>
<td></td>
<td>-10.2 (2.2)</td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrested and ever charged</td>
<td>-16.8 (-2.2)</td>
<td>-8.1 (2.1)</td>
<td></td>
</tr>
<tr>
<td>Arrested and charged as a minor</td>
<td>-17.4 (2.1)</td>
<td></td>
<td>-10.4 (2.1)</td>
</tr>
</tbody>
</table>

Notes: See notes in table 2.

**Concluding remarks**

The evolution of the RADL

Undertaking econometric modelling using samples from small populations such as Indigenous Australians, is difficult because of the data constraints facing researcher. One constraint is that it is difficult for official data agencies to publicly release data without potentially compromising the confidentiality of clients. The ABS has been attempting to relax some of these constraints on analysts by providing more detailed unit record files that can only be accessed by RADL. This allows them to control the process so as to ensure that they can guarantee the confidentiality of people participating in the process. This paper has availed itself of the greater detail available in the 2002 NATSISS CURF (compared to the 1994 NATIS CURF).

The initial ABS RADL used only SAS and SPSS, which have historically been favoured by people who use large data sets. Since 31 October 2005, the ABS has allowed approved researchers were able to run queries in STATA, a statistical program that is widely used in the social sciences and biometrics. The ABS have a depth of experience in using SAS and SPSS, but less experience with STATA. This paper has been estimated solely using STATA on RADL and unequivocally demonstrates that useful analysis can be done through this route. Notwithstanding, there is more that can be done using STATA on RADL, and this section explores the possibilities.

In the initial trail of STATA, the ABS had an injunction against using the standard programming tools as this might allow the analysts to unpack the CURF and hence compromise confidentiality of respondents. One consequence of this is that it is not possible to corroborate that part of Borland and Hunter (2000) that used maximum likelihood techniques to estimate the system of equations estimated in this paper. The inability to construct user-defined programs also meant that the number of diagnostics for the regression analysis was limited.

While the ABS’s apprehension about endorsing the blanket use of macros is understandable, there is a relatively simple solution to this issue. STATA allows users to call on sub-routines called ‘ado files’ and these programs could be vetted and controlled by the ABS. The ABS can scrutinise the ado file to examine whether the program might compromise their criteria. If they were any concerns for some part of
the program, then the ABS could suppress the output for that part of the output and only release the final output (i.e. run the program quietly). Of course, if the final product could itself be abused, then the ABS would be able to reject the sub-routine. Approved ado files can be stored on the appropriate ABS computers. The ABS have approved one set of ado files to date, the ‘SVR’ programs that allow users to calculate survey estimates using replicate weights to accurately estimate measures of reliability that take into account survey design effects. These programs have been widely used in the STATA community for several years.

STATA is a flexible tool, but the standard package does not allow the researchers to explore the data using all the latest techniques. The use of ado files is common among STATA users and often such files are precursors to what become standard features of the next upgrade of the program. Clearly, the ABS are thinking about the issues involved, but it would be timely for a dialogue between users and ABS with respect to a streamlined procedure for clearing user-defined sub-routines that are consistent with the statutory requirements of the ABS.

Policy options

The RCADC recognised that ‘…Too many Aboriginal people are in custody too often’, and recommended a strategy of imprisonment as last resort to reduce the level of over representation of Indigenous people in custody (Commonwealth of Australia 1991). More recently one commentator Baker (2001) has concluded that reducing the rate of court appearances provides the greatest leverage for reducing Indigenous imprisonment rates. Obviously one clear way of achieving lower court appearance rates and in diverting people away from court is to reduce the rate at which Indigenous persons are arrested. This requires police in the first instance to opt for alternatives to arrest.

While the 1994 NATSIS and 2002 NATSISS have provided some valuable insights into the processes underlying the disproportionate level of Indigenous arrest (Carcach & Mukherjee 1996; Hunter 1998; 2001; Hunter & Borland 1999), 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 in prisons and other stages of the criminal justice system, 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.

The importance of being charged as a minor illustrate that the factors driving Indigenous employment disadvantage are likely to be long run factors. Recent National Bureau of Economic Research (NBER) research shows how economists have systematically discounted non-cognitive abilities when estimating the factors underlying labour market disadvantage (Cunha et al. 2005). Non-cognitive abilities are formed early in life and are likely to be heavily influenced by family background in the early years. The evidence presented in this paper is consistent with this proposition, which should be explored in the context of Indigenous Australia in future research.

Exploring the cumulative effect of repeated arrest of many Indigenous youth described in Chen et al (2005) is one avenue for this research. Once an Indigenous youth offends the probability that the youth will re-offend is close to one. With each re-

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5 See Broadhurst et al. (1994).
appearance in court, the chance of a custodial sentence for such youth increases. The
disruption of appearing in court (and eventually going to jail) would not be conducive
to the stability in the home environment that is required to facilitate non-cognitive
abilities (which includes motivation, persistence, and self-discipline). While this scenario
is rather speculative, it does provide a behavioural pathway to explaining why arrest is
so important in constraining Indigenous employment outcomes. Notwithstanding such
speculation, the above analysis is not powerful enough to separately identify demand
from supply effects (see discussion in Borland and Hunter 2000).

Notwithstanding, given that JSCI targets people with a prison history, and
that the net effect of incarceration on Indigenous employment is negative, it is safe to
assume that the implicit weights given to such factors in the JSCI are not excessive. In
order to progress policy beyond necessarily cautious statements, a more structural
model of crime and arrest is required.

Comparisons with non-Indigenous Australians

Unfortunately, the scope for benchmarking these Indigenous results are
circumscribed by the failure to collect analogous crime and justice data for the non-
Indigenous survey, the General Social Survey (GSS)—one exception is the limited
range of variables relating to the individuals experience of crime. It is too easy for
NATSIISS-based research to be dismissed as being specific to the Indigenous population,
simply because there was no general omnibus survey at the time that collected a similar
range of data on arrest and incarceration.

The ABS’s decision to leave out such variables from the GSS could be
rationalised on the grounds that any survey estimates of incarceration (and most other
aspects of involvement with the criminal justice system) for the non-Indigenous
population would have high relative standard errors, especially given the current sample
size. However, the failure to collect such information for the majority of Australians
limits the our capacity to understand Indigenous disadvantage as many socioeconomic
outcomes have been shown to be behaviourally related to arrest, at least for the
Indigenous population. That is, while it is well established that socioeconomic factors
explain crime rates, criminal activity also partially drive socioeconomic outcomes
and hence we need information on both for the whole population in order to understand
the origins of Indigenous disadvantage (Borland & Hunter 2000; Hunter 2001).

Even if there is not sufficient number of GSS respondents to identify the extent
of interactions between socioeconomic outcomes and crime for the non-Indigenous
population, pooled estimates (i.e. by combining the GSS and NATSISS data sets) would
allow researchers to estimate more robust estimators of the factors underlying overall
Indigenous disadvantage, and hence allow us to appreciate the overall importance of
interactions with the criminal justice system in the cycle of social exclusion.

The economic and social costs of low rates of employment for Indigenous
Australians are significant and represent a major problem for policy-makers in Australia
(see for example, Hunter & Taylor 2002). Much attention has been devoted to policy
solutions to the problem of low rates of employment which involve direct labour market
intervention. The analysis in this paper suggests that it will also be necessary to address
the social environment in which individuals make decisions about labour supply and
labour demand—and in particular, to address the problem of high rates of Indigenous
Australians interacting with the criminal justice system.
Table A1 - Summary statistics for joint modelling of interaction with criminal justice system and non-CDEP employment, 2002

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>empncdep</td>
<td>Employed in non-CDEP work</td>
<td>0.264</td>
<td>0.329</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.441)</td>
<td>(0.470)</td>
</tr>
<tr>
<td>arrested</td>
<td>Arrested in last 5 years</td>
<td>0.096</td>
<td>0.249</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.294)</td>
<td>(0.433)</td>
</tr>
<tr>
<td>charged</td>
<td>Ever formally charged by police</td>
<td>0.224</td>
<td>0.517</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.417)</td>
<td>(0.500)</td>
</tr>
<tr>
<td>incarcerated</td>
<td>Incarcerated in last 5 years</td>
<td>0.030</td>
<td>0.118</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.171)</td>
<td>(0.323)</td>
</tr>
<tr>
<td>chminor</td>
<td>Charged as minor</td>
<td>0.096</td>
<td>0.249</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.294)</td>
<td>(0.433)</td>
</tr>
<tr>
<td>age</td>
<td>Age (in years)</td>
<td>36.051</td>
<td>35.542</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(14.507)</td>
<td>(14.538)</td>
</tr>
<tr>
<td>innerreg</td>
<td>Inner Regional Area (ASGC)</td>
<td>0.135</td>
<td>0.131</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.342)</td>
<td>(0.338)</td>
</tr>
<tr>
<td>outerreg</td>
<td>Outer Regional Area (ASGC)</td>
<td>0.275</td>
<td>0.266</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.447)</td>
<td>(0.442)</td>
</tr>
<tr>
<td>remote</td>
<td>Remote or Very Remote Area (ASGC)</td>
<td>0.427</td>
<td>0.447</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.495)</td>
<td>(0.497)</td>
</tr>
<tr>
<td>dinfineng</td>
<td>Difficulties in communicating with service providers</td>
<td>0.168</td>
<td>0.158</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.374)</td>
<td>(0.364)</td>
</tr>
<tr>
<td>degr dip</td>
<td>Highest educational attainment is degree or diploma</td>
<td>0.067</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.251)</td>
<td>(0.196)</td>
</tr>
<tr>
<td>certif</td>
<td>Highest educational attainment is certificate qualification</td>
<td>0.089</td>
<td>0.137</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.285)</td>
<td>(0.344)</td>
</tr>
<tr>
<td>year12</td>
<td>Highest educational attainment is Year 12</td>
<td>0.105</td>
<td>0.097</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.306)</td>
<td>(0.296)</td>
</tr>
<tr>
<td>year1011</td>
<td>Highest educational attainment is Year 10 or 11</td>
<td>0.364</td>
<td>0.323</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.481)</td>
<td>(0.467)</td>
</tr>
<tr>
<td>year9</td>
<td>Highest educational attainment is Year 9</td>
<td>0.137</td>
<td>0.144</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.344)</td>
<td>(0.351)</td>
</tr>
<tr>
<td>onekid</td>
<td>One dependant in household</td>
<td>0.184</td>
<td>0.160</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.387)</td>
<td>(0.366)</td>
</tr>
<tr>
<td>twothkid</td>
<td>Two or three dependants in household</td>
<td>0.350</td>
<td>0.302</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.477)</td>
<td>(0.459)</td>
</tr>
<tr>
<td>four pkid</td>
<td>Four or more dependants in household</td>
<td>0.172</td>
<td>0.154</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.378)</td>
<td>(0.361)</td>
</tr>
<tr>
<td>solepar</td>
<td>One parent family with children</td>
<td>0.349</td>
<td>0.179</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.477)</td>
<td>(0.384)</td>
</tr>
<tr>
<td>mixedh</td>
<td>Households that include both Indigenous and non-Indigenous people</td>
<td>0.262</td>
<td>0.293</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.440)</td>
<td>(0.455)</td>
</tr>
<tr>
<td>multifam</td>
<td>More than one family living in a household</td>
<td>0.178</td>
<td>0.164</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.383)</td>
<td>(0.370)</td>
</tr>
<tr>
<td>indiglan</td>
<td>Speaks an Indigenous language</td>
<td>0.503</td>
<td>0.509</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.500)</td>
<td>(0.500)</td>
</tr>
<tr>
<td>fairpoor</td>
<td>Self assessed health status is poor or fair</td>
<td>0.248</td>
<td>0.286</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.432)</td>
<td>(0.452)</td>
</tr>
<tr>
<td>drinks</td>
<td>Whether drank alcohol in last 12 months</td>
<td>0.614</td>
<td>0.743</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.487)</td>
<td>(0.437)</td>
</tr>
<tr>
<td>highrisk</td>
<td>Alcohol consumption level in last 12 months was at 'high risk' levels</td>
<td>0.047</td>
<td>0.085</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.211)</td>
<td>(0.279)</td>
</tr>
<tr>
<td>taken</td>
<td>Taken from your natural family</td>
<td>0.082</td>
<td>0.079</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.274)</td>
<td>(0.270)</td>
</tr>
<tr>
<td>Obs</td>
<td>Number of respondents who answered relevant questions</td>
<td>4,412</td>
<td>3,259</td>
</tr>
</tbody>
</table>
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