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THE DETERMINANTS OF LABOUR FORCE STATUS AMONG INDIGENOUS AUSTRALIANS

by

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Abstract

It is well established that Indigenous Australians are heavily over-represented among Australia's most disadvantaged citizens. An important component of this disadvantage is the limited and often unsuccessful engagement of Indigenous people with the labour market. To better understand this reality, the present paper explores the forces which influence the labour market status of Indigenous people. For this purpose, multinomial logit regression analysis is used to model labour force status as a function of factors relating to geography, demographic characteristics, education, health, culture, crime and housing issues. The analysis is conducted utilising the 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS). Particular attention is given to geographic issues, revealing significant variations between the determinants of labour force status in non-remote and remote areas. The results also demonstrate the relevance of a wide range of factors in determining labour force status among Indigenous people, highlighting the complex array of issues which should be considered in attempts to increase employment.

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1. Introduction

It is well established that the Aboriginal and Torres Strait Islander (Indigenous) people of Australia fare poorly against standard indicators of wellbeing and are heavily over-represented among Australia's most disadvantaged citizens. A significant component of this disadvantage is the economic and social consequences of relatively weak labour market engagement among the Indigenous community. Indeed, many Indigenous leaders contend that limited and unsuccessful participation in the labour market is intrinsic to the perpetuation of poor socioeconomic outcomes endured by many Indigenous Australians (Ah Kit, 2002; Pearson, 2008). Given this, a clear understanding of the determinants of Indigenous labour market outcomes is of fundamental importance to government attempts to successfully enhance the wellbeing of Australia's Indigenous community.

The present study provides a comprehensive analysis of the determinants of labour market status among Indigenous Australians. This investigation is conducted using multinomial logit regression analysis, in which labour force status is modelled as a function of factors relating to geography, demographic characteristics, education, health, culture, crime and housing issues.

The analysis reveals that labour force status is strongly influenced by a diverse range of factors. Indeed, while the role of factors like education are often premised as the 'answer' to increasing employment, the marginal effects on employment probability associated with variables such as the presence of four or more dependants, poor health, living in an ethnically mixed household and recent arrest are at least three times stronger than the effects of completing year 12 studies relative to having only a year 10 education. While this is not to refute the importance of education, it highlights the reality that employment status is affected by a wide range of socio-cultural factors, many of which should be considered in attempts to increase Indigenous employment, such as the Federal Government's ongoing 'Closing the Gap' initiative.

A particular focus of the present study is the variations in labour market outcomes between geographic regions and the causes of these variations. This is an important focus given the significant cultural, social, historical and economic heterogeneity of the Indigenous population across regions, differences which are particularly

significant between non-remote and remote areas. In particular, remote areas are known to have significantly worse outcomes in relation to the labour market and many of the determinants used in this paper, a reality which has increasingly become a topic of academic and policy focus (Hughes, 2007; Hunter, 2007). This focus is continued in the present paper by the disaggregation of its analysis between non-remote and remote areas. This approach demonstrates that the marginal effects associated with education, health and recent arrests are systematically weaker in remote areas, implying that there is a lower return to human capital in remote areas. These low returns may be indicative of conditions described by the Segmented Labour Market (SLM) theory. Further, the analysis reveals strong similarities between the determinants of unemployment and participation in the Community Development and Employment Program (CDEP) in non-remote and remote areas, respectively – a conclusion which indicates that unemployment may increase significantly as the CDEP is scaled back under current policy initiatives.

It is also of note that the survey on which this study is based, the 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS), is soon to be followed by the 2008 NATSISS – expected to become publicly available during 2010. In light of this, it is hoped that the present paper will provide a useful summary of previous research and a suitable base for future analysis of the 2008 NATSISS and other data sources. We turn now to Section 2, which contains a review of previous research on the factors associated with labour force status among Indigenous Australians. This is followed by Section 3 which outlines the data issues and methodology for the empirical analysis, the results of which are presented in Section 4. The implications of these results are then considered in Section 5, with the discussion concluded in Section 6.

2. Literature Review

Previous analyses of labour market outcomes among Indigenous Australians tend to explicitly or implicitly utilise the dominant neoclassical human capital framework. In this framework, employment and labour supply are expected to respond positively to increased human capital, such as education. In contrast, SLM theory contends that human capital has only a limited role in determining an individual's labour force status relative to the dominant effect of socio-cultural or institutional factors (Cain,

1976: 1222). As SLM theory has its roots in diagnosing the employment outcomes of disadvantaged minorities who operate in "ghetto labour markets [in which] the factors conventionally associated with 'productivity' – like years of schooling and vocational training – had almost no influence on employment prospects" (Gordon, 1972: 44), this paper adopts the SLM framework as a logical counterpoint to the dominant neoclassical human capital model for it analysis of the Indigenous labour market.

At the outset of this review, it is also necessary to briefly consider the labour market implications of the CDEP scheme. The CDEP was established in 1977 to provide community managed incomes for remote Indigenous communities with weak local labour markets. It since spread to most areas with significant Indigenous populations and in 2002-03 covered 12.7 per cent of Indigenous people aged 15 to 64 (Altman *et al.*, 2005: 6). At this time, CDEP participants were remunerated for work in roles ranging from health and teaching assistants, to activities traditionally outside employment, in some instances including housework or attending funerals (Hudson, 2008: 2). This diversity of activities reflects the CDEP's disparate objectives, which included: supplementing scarce opportunities for work; supporting community development and cultural activities; delivering income assistance and building work readiness (Altman and Sanders, 2008: 4). An important issue relating to the CDEP is its heavy concentration in remote and very remote areas, where it covered 16.9 and 42.2 per cent of working age Indigenous people respectively in 2002-03, compared to only 4.7 per cent of this group in non-remote areas (Gray and Chapman, 2006: 117). This highlights that, as a government program in which participation is not driven by typical market forces, determinants of CDEP participation differ significantly from those of mainstream employment prospects – a reality which can complicate standard analysis. Accordingly, many studies include CDEP participation as a fourth labour force category, distinct from mainstream employment (henceforth simply 'employment')[1], a precedent to which this paper adheres.

Geography

Living in remote and very remote areas has been shown to have a significant negative effect on employment (Borland and Hunter, 2000; Hunter and Gray, 2001; Ross, 2006a; Hunter, 1997, 2002b). One study finds that, relative to a reference

[1]Separating CDEP from mainstream employment should not be interpreted as a normative statement on the relative merits of the CDEP scheme. For relevant discussion see Altman and Sanders (2008) or Hudson (2008).

group which 'lives in an urban area but not in a capital city', living in a remote area had a negative marginal effect on employment of 11.6 and 6.7 percentage points for men and women respectively (Hunter and Gray, 2001: 122-3). Significantly, however, remoteness is not associated with a fall in participation and is actually accompanied by a decrease in unemployment. This seemingly paradoxical result is driven by the role of CDEP, which, relative to the same reference group, increased by 23.3 percentage points in association with living in remote areas (Hunter and Gray, 2001: 122-3).

The most commonly noted cause of low employment in remote areas is the relatively weak labour markets in these regions. However, there are a number of other factors thought to contribute to employment disparities between Indigenous people living in remote and non-remote areas. In particular, education levels and other elements of human capital are typically lower in remote areas; remote populations generally have stronger attachment to traditional cultures and lifestyles and relatively weak and more recently established relationships with non-Indigenous society and institutions (Gray and Chapman, 2006: 117). While studies, such as Hunter and Gray (2001), have been able to control for some of these variables, data limitations preclude controlling for all such variables. This limitation leads to some ambiguity in explaining the significance of labour market weakness relative to other factors, as explored in subsequent sections.

In addition, the 'easy' access to CDEP positions in remote areas, and the 'easy money' it provides, is thought by some to further weaken the tenuous connection of remote Indigenous people to the mainstream labour market. As Hughes (2007) states: in some remote areas the "CDEP scheme has distorted labour supply, making it difficult for men and women to contemplate mainstream work" (Hughes 2007: 72). This complex interaction again points to the need for careful separate analysis of the determinants of employment and CDEP participation.

In considering the impact of geography, Biddle and Webster (2007) explore the potential effect of the local labour market on labour market status among Indigenous Australians. By controlling for the local employment to population ratio and the unemployment rate, this analysis revealed that those in high unemployment or low employment areas were themselves more likely to be labour force non-participants

or unemployed, even after controlling for their personal characteristics (Biddle and Webster, 2007: 39). Importantly, after these area level labour market characteristics were considered, the effect of living in a remote area on labour supply and unemployment declined significantly, confirming the salience of weak labour markets in creating poor employment outcomes.

Age

Age is included as a determinant in many models of labour force status in order to capture the role of life-cycle effects on labour supply and to act as a proxy for labour market experience. However, given the relatively weak labour market attachment of the Indigenous population, it is likely that the raw variable of age will tend to overstate labour market experience and thus some doubt has been cast on the relevance of age as a proxy for experience (Daly, 1994: 8; Gray and Chapman, 2006: 120). This concern notwithstanding, studies of the Indigenous labour market report results consistent with standard expectations. That is, the marginal effect of age on employment and participation is consistently found to be positive, at least until a critical point, typically around 45 years of age (Biddle and Webster, 2007; Hunter, 1997; Hunter and Gray, 2001). Notably, the labour supply of Indigenous youth appears particularly constrained (Hunter, 2004: 43). This group also experiences particularly high unemployment, which has long been an area of policy concern and subject of research interest (Miller, 1989, 1991).

Family characteristics

Standard models of labour supply suggest that a number of family characteristics, such as marital status and the presence and number of dependants, will impact on the individual's labour force status (Killingsworth, 1983). Differing conclusions have been reached regarding the labour market implications of marriage among Indigenous people. Some studies (Daly, 1993, 1995; Hunter and Gray, 2001) found that marriage is associated with decreased employment among women, but with an increase for males. However, other papers show a positive marginal effect of marriage on the employment probability among both males and females (Biddle and Webster, 2007; Borland and Hunter, 2000; Hunter, 2002b; Ross, 2006a), which contrasts with Gray and Hunter (1999), who find a negative effect for both males and females. Despite this incongruity, these studies consistently find that the marginal

effect of marriage is more positive, or less negative, for males than for females. These effects can be better understood by noting that participation increases with marriage among Indigenous males, but declines significantly among married Indigenous females, who are also less likely to be unemployed than their unmarried counterparts (Hunter and Gray, 2002: 6). This may indicate that the increased financial security and domestic responsibility associated with marriage increases the reservation wage of women, therefore encouraging them, particularly those with poor employment prospects, to leave the labour market, thus reducing female labour supply and unemployment. This is largely consistent with standard expectations and research on different populations (Hill, 1979).

Using the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS), Hunter and Gray (2002) find having dependants leads to a fall in employment among both males and females. This effect is strongest for females and increases for more children, with a negative marginal effect of over 20 percentage points for women with four or more children (Hunter and Gray, 2001: 23). For females, the decline in employment is also associated with declines in the unemployment rate and CDEP participation. This is consistent with traditional models of labour supply, given that the presence of children increases the shadow wage and therefore reduces female participation (Smith, 2003: 20). The key features of these findings are similar to other studies of Indigenous people which used the same data (Hunter, 1997; Borland and Hunter, 2000) and those utilising Census data[2] (Daly *et al*., 1993; Daly, 1993, 1995).

Education

As a key determinant of human capital, it is unsurprising that virtually all studies have found increased education to be associated with a statistically significant positive effect on participation and employment rates among Indigenous people (Biddle and Webster, 2007; Borland and Hunter, 2000; Daly, 1995; Gray and Hunter, 2005; Hunter and Daly, 2008; Hunter and Gray, 2001; Jones, 1991; Ross, 2006a). The positive effects of education were found to extend to both school and non-school qualifications. For example, studies which used 'left school between years 6 and 9' as the reference group found that the marginal effect on the probability of

[2]Hunter and Daly (2008) utilise the more recent 2002 NATSISS to investigate the effect of lifetime fertility, rather than current dependants, on labour supply among Indigenous females. They find that, after controlling for other factors, female fertility rates are not correlated with any particular labour market outcome.

employment of completing year 12 schooling was between 10 and 25 percentage points, while a non-school qualification was associated with marginal effects up to 25.5 percentage points (Borland and Hunter, 2000:136; Hunter and Gray, 2001: 122-3; Hunter, 1997: 181).

A variable for 'difficulty in English' is often considered and is typically found to have a negative marginal effect on the probability of employment, ranging from 6.4 to 16.4 percentage points (Borland and Hunter, 2000; Hunter and Gray, 2001).

Several studies find that education and English difficulty generally have a stronger effect on the probability of employment among Indigenous females relative to males, a pattern which holds for all educational increments, except for non-tertiary non-school qualifications (Hunter, 2002a, 2002b; Hunter and Gray, 2001; Daly, 1995). It is also of interest that most education variables have the opposite effect on CDEP participation compared with employment (Hunter and Gray, 2001: 122-3; Biddle and Webster, 2007: 36).

Using the 2001 Census, Hunter (2004) examines the inter-regional variations in the effect of educational attainment on the probability of employment. In general, it is found that education has a stronger effect in remote areas than in metropolitan areas (Hunter, 2004: 71). It is suggested that this difference is driven by the stronger effect of 'signalling' in remote areas, were education levels are generally lower, meaning that those who have more qualifications send a strong positive signal to potential employers regarding their ability and motivation (Hunter, 2004: 70).

Health

Within the human capital framework, an individual's health affects their labour force status through its implications for their labour market productivity (Grossman, 1972). Two main measures of Indigenous health, 'self-assessed health status' (SAHS) and disability status, are available in the relevant data sets and are analysed by several studies (Hunter, 1997, 2002b; Borland and Hunter, 2000; Hunter and Daly, 2008; Hunter and Gray, 2001; Ross, 2006a). While there is some concern regarding the consistency of information relating to SAHS among Indigenous Australians (see Booth and Carroll 2005; Crossley and Kennedy 2002; Sibthorpe *et al*. 2001; Ross, 2006b), the data on this topic is considered sufficiently reliable for use in technical

analyses (Ross, 2006a: 68). After controlling for variables which interact with health and disability status, Ross (2006a) finds that SAHS and disability status continue to have the expected coefficients in relation to labour force status. In particular, the probability of employment is shown to unambiguously decline in association with fair or poor SAHS compared to a reference group with excellent health, and for a major disability[3] (Ross 2006a: 76-8). These findings are congruent with both the predictions of human capital models and prior studies of Indigenous labour force status (Borland and Hunter, 2000; Hunter, 1997; Hunter and Gray, 2001).

Despite the widely cited adverse effects on the Indigenous community of alcohol abuse, the labour market implications of this factor have so far received little systematic analysis. An exception is Hunter and Daly (2008), who show that, compared with a reference group who 'never drank alcohol', participation among Indigenous females declined by 10 percentage points in association with 'high-risk' alcohol use, but increased by 12.3 percentage points for having 'ever drank alcohol' (Hunter and Daly, 2008, 7). The positive effect associated with moderate alcohol use is consistent with studies of non-Indigenous populations (MacDonald and Shields, 2004; Terza, 2002) and may reflect the difficulty of acquiring alcohol for those without jobs or, invoking the human capital framework, the health benefits associated with moderate alcohol use relative to abstention or heavy drinking (Barrett, 2002: 79).

Culture

The labour market implications of 'cultural attachment' among Indigenous people have also been considered in a number of studies. A commonly used proxy for cultural attachment is the incidence of speaking an Indigenous language. This variable is generally found to be negatively correlated with employment, with one study finding a negative marginal effect of approximately 8 and 2.3 percentage points respectively for males and females (Hunter and Gray, 2001: 121-2). Speaking an Indigenous language is also associated with a decrease in the probability of unemployment, but a statistically significant increase in CDEP participation and being not in the labour force (Hunter and Gray, 2001: 121-2). That is, connection with the mainstream labour market, as either employed or unemployed, falls and is

[3]Ross (2006a) does not provide information on marginal effects; however, using the same data Biddle and Webster find that the probability of employment falls by 14.8 percentage points for a disability (2007: 36).

offset by a corresponding decline in participation and increase in CDEP employment. This may reflect a stronger preference for traditional activities outside the mainstream labour market, and the more limited employment opportunities, available to more traditional people (Altman *et al*., 2005: 21). However, as proficiency in an Indigenous language is more prevalent in very-remote areas, the statistical association between labour market status and speaking an Indigenous language may simply be driven by the low rates of employment in very remote areas. Hunter and Gray (2001) note that this relationship may also contribute to the positive association between speaking an Indigenous language and CDEP participation, reflecting the CDEP's strong presence in very remote areas (Hunter and Gray, 2001: 126). This issue is not easily resolved since available data are not disaggregated between remote and very remote areas, a limitation with implications discussed further in subsequent analysis.

Living in an 'ethnically mixed household', a household which includes a non-Indigenous occupant, is associated with a significant effect on labour force status. For example, one study finds this variable to be associated with a positive effect on the probability of employment of 21 and 14 percentage points for males and females, respectively – a large effect roughly equivalent to that associated with completing year 12, relative to leaving school between years 6 and 9 (Borland and Hunter, 2000: 136). These marginal effects may incorporate the positive labour market implications of greater exposure, interaction and integration with non-Indigenous society and culture. As such, the mixed household variable may be a proxy for the positive labour force implications of not living in a culturally or geographically isolated urban 'ghetto' or remote community (Hughes, 2007). In addition, as non-Indigenous people are more likely to be employed than Indigenous people, the effect of living in a mixed household may reflect the documented correlation between the labour force statuses of partners[4] (Miller and Volker, 1987; Miller, 1989, 1997). Therefore, there are a number of mechanisms through which living in a mixed household may be more conducive to employment for Indigenous people. However, as the number of mixed families is known to be inversely related with remoteness (Riley, 1994; Ross, 1999), failing to disaggregate between remote and very remote areas, due to data

[4] It should be noted that the association of living in an ethnically mixed household with increased probability of employment may also reflect a higher propensity for 'out marriage' among Indigenous people in employment. That is, reverse causality is also a distinct prospect.

limitations, again means the marginal effects on employment and CDEP participation of living in a mixed household may be overstated.

Identifying as of TSI heritage, relative to identifying as Aboriginal, and having been removed from one's natural family are generally found to have negligible implications for labour force status (Biddle and Webster, 2007: 36; Hunter and Gray, 2001: 121). This notwithstanding, Hunter and Borland (1997) find that removal from one's family is associated with an increased probability of arrest and, thus, has an indirect negative effect on the probability of employment (Hunter and Borland, 1997: 24). Interestingly, while the results of most papers point to some tension between most measures of cultural attachment and mainstream employment, Dockery (2009) presents a more nuanced conclusion, suggesting that strong cultural attachment could even be associated with higher rates of employment.

Crime

Several studies have investigated the implications of interaction with the criminal justice system on labour force status. Without exception these studies find that the incidence of arrest in the last 5 years is associated with a strong negative marginal effect on the probability of employment, ranging from approximately 10 to 20 percentage points, and is considerably stronger for males (Biddle and Webster, 2007: 39; Borland and Hunter, 2000: 136; Hunter and Gray, 2001: 122-3). Arrest is also associated with a large increase in the incidence of unemployment; a moderate rise in CDEP participation; but only a weak negative effect on participation (Biddle and Webster, 2007: 36; Hunter and Gray, 2001: 122-3). These results indicate that arrest does not reduce the desire for labour market participation (labour supply), but significantly reduces the prospects of finding employment (labour demand)[5].

Housing issues

The poor housing conditions experienced by a significant portion of the Indigenous population, particularly in remote areas, has also been widely cited as negatively interacting with employment outcomes (Hunter, 2004; Hunter and Daly, 2008; Gray and Hunter, 1999; Biddle and Hunter, 2006b; SCRGSP, 2009). Taylor (2008) notes:

[5] There is, however, some ambiguity relating to this interpretation: Borland and Hunter (2000) reach the opposite conclusion, suggesting "the effect of arrest on employment may represent a supply-side rather than demand-side phenomenon" (Borland and Hunter, 2000: 140).

> ...the set of supply-side issues that may mitigate against successful Indigenous [labour market] participation are more wide-ranging than just the skill-set brought to the labour market. Indeed, they include... key points of intersection between Indigenous peoples and government policy... [such as] housing... (p. 2).

However, this effect has not been demonstrated by any systematic labour market study. Further, the mechanism for this effect is not articulated beyond the conclusion that limited access to sufficient housing has "negative consequences for population characteristics that directly impinge on labour supply and economic participation, notably health status and educational performance" (Taylor, 2008: 53).

Table 1 – The Effect of Selected Variables on the Probability of Employment

Determinants	Marginal Effect on Probability of Employment	Referenced from
Geography		
Living in Remote Areas	Highly significant, strong negative marginal effect ranging between -6 and -14 percentage points*	Biddle and Webster, 2007; Borland and Hunter, 2000; Hunter and Gray, 2001; Ross, 2006a; Hunter, 1997, 2002b
Family Characteristics		
Dependants	Highly significant, strong negative marginal effect of up to -20.5 percentage points for females with four or more dependants	Hunter and Gray, 2001; Hunter, 1997; Borland and Hunter, 2000; Daly *et al*., 1993; Daly, 1993, 1995
Marital Status	Ambiguous	
Education		
Leaving school before Yr 10	Highly significant, strong negative marginal effect ranging from -2.2 to -9.4 percentage points*	Borland and Hunter, 2000; Hunter, 2002b; Hunter and Gray, 2001; Hunter, 1997
Completing Yr 12	Highly significant, strong positive marginal effect ranging from 9.8 to 28.6 percentage points*	Biddle and Webster, 2007; Borland and Hunter, 2000; Hunter, 2002b; Hunter and Gray, 2001
Non-school	Highly significant, strong positive marginal effect, ranging from 14.8 to 39.3 percentage points*	Biddle and Webster, 2007; Borland and Hunter, 2000; Hunter, 2002b; Hunter and Gray, 2001; Hunter, 1997
English Difficulty	Highly significant, strong negative marginal effect ranging from -6.4 to -16.4 percentage points	Borland and Hunter, 2000; Hunter, 2002b; Hunter and Gray, 2001
Health		
Disability	Highly significant, strong negative marginal effect of 14.8 percentage points	Biddle and Webster, 2007
Fair/ Poor SAHS	Highly significant, no marginal effect available	Ross, 2006a
Cultural		
Mixed Household	Highly significant, strong positive marginal effect ranging from 9.5 to 21 percentage points	Borland and Hunter, 2000; Hunter and Gray, 2001
Indigenous language	Highly significant, strong negative marginal effect ranging from -2.3 to -18 percentage points	Biddle and Webster, 2007; Hunter and Gray, 2001
Crime		
Arrest	Highly significant, strong negative marginal effect ranging from -10 to -20.7 percentage points	Biddle and Webster, 2007; Borland and Hunter, 2000; Hunter and Gray, 2001

*Results differ significantly depending on choice of reference group

The above discussion has identified the influence of a number of important factors on labour market status. In response to changes in these factors, employment and participation typically move in the same direction, while CDEP participation and unemployment also move together, but in the opposite direction to employment. The

main exception to this is that for increasing remoteness, employment and unemployment decline, while CDEP participation increases, leading to relatively constant labour supply. The review reveals little evidence suggesting the relevance of SLM theory to the Indigenous labour market, as the factors reviewed tend to affect labour force status, and employment probability in particular, in the direction anticipated by the human capital framework. The influence on employment probability of several important factors are summarised above in Table 1.

The studies considered above cover a wide range of the main factors thought likely to impact the labour force status of Indigenous Australians. However, no study incorporates all these factors simultaneously. Further, there are a number of additional factors likely to influence labour force status which have not been incorporated into previous analysis. Therefore, the present paper contributes to this research by the use a more encompassing specification of the estimating equation to derive a set of estimates of the determinants of labour force status among Indigenous Australians. It also adds to existing literature by including 'new' variables for culture, health and housing quality. Further, the present paper also expands on previous analysis of geographic factors by disaggregating the analysis between non-remote and remote areas. This more comprehensive analysis may serve as a benchmark for future studies as new data, such as the 2008 NATSISS, become available.

3. Data and Methodology

The 2002 NATSISS

The 2002 NATSISS, released for full public access in 2005, was the second major national survey to have collected information specifically on Indigenous Australians. At the time of collection the survey was thought to represent 1 in 30 Indigenous people over 15 years of age (ABS, 2005a: 5). This sample size is argued to permit reasonably accurate inferences about the general population, as has been demonstrated by comparisons with other data sources. For example, the rate of CDEP participation reported in the 2002 NATSIS is almost identical to that recorded in CDEP administrative data[6] (Biddle and Hunter, 2006: 40). However, despite

[6] A similar test for the underreporting of arrest was conducted by comparing West Australian Police Force records with results in the 1994 NATSIS, which revealed that the survey results were accurate (Borland and Hunter, 2000: 127).

corroborating evidence on some key survey results, concerns exist regarding some survey techniques and results.

Importantly, it is thought that the survey's exclusion of residents of non-private dwellings has the potential to skew information on certain areas of interest. At the time of collection this excluded subgroup, that is residents of hotels, hostels, hospitals, short-stay caravan parks, prisons and other correctional facilities, were estimated to comprise 4 per cent of the Indigenous population (ABS, 2005a: 3). Members of this subgroup are known to differ significantly from the broader Indigenous population in a number of respects. In particular, they are more likely to have been arrested in the last five years, concentrated outside capital cities, more likely to be male, young and to have been taken from their natural families (Biddle and Hunter, 2006: 33). Residents of non-private dwellings are also expected to have worse health outcomes (Ross, 2006a: 70). Given the heterogeneity between these two populations, the information relating to a number of issues in the 2002 NATSISS is likely to be subject to some selection bias.

The information on alcohol use in the 2002 NATSISS has been identified as particularly problematic. In particular, Chikritzhs and Brady (2006) conducted an exhaustive review of this issue and concluded that the rate of 'at risk drinking' is affected by underreporting to such an extent that the 2002 NATSISS may understate the incidence of high risk drinking by a factor of three or more (Chikritzhs and Brady, 2006: 245). Despite these concerns, this information has been used in previous research (see, for example, Hunter and Daly, 2008).

Finally, a number of restrictions to the range of operations permitted in analysing 2002 NATSISS data, required to ensure participant's privacy, prohibit some areas of analysis. In particular, while it is possible to control for state or region of residence in separate analysis, these operations are not possible jointly. Second, though information was collected separately for remote and very remote areas, they are reported in aggregate as 'remote', preventing separate analysis of these regions. As noted in Section 2, this aggregation causes ambiguities in the interpretation of variables which are known to correlate with increased remoteness, such as speaking an Indigenous language and living in an ethnically mixed household. Further, the inability to separately analyse information relating to residents of very remote areas

hinders research on a group known to have particularly poor socio-economic and labour market outcomes. As Altman and Hunter (2006) note, there is a "worrying mismatch between the level at which data are available and the level at which they are increasingly needed..." (Altman and Hunter, 2006: 314).

The 2002 NATSIS was based on information from 9359 individuals drawn from 5887 households. For the purposes of this study individuals aged over 65 years of age, full-time students and those with missing information are excluded, reducing the sample to 7701 people, with 3275 males and 4426 females. Through application of the unit weights provided in the CURF, the results presented may be interpreted as reflective of the Indigenous population as a whole (Biddle and Hunter, 2006: 41).

Methodology

The main purpose of this paper's empirical analysis is to model the labour market categories of Indigenous Australians as a function of exogenous variables covering geography, demographic characteristics, education, health, culture, crime and housing issues. The variables relating to these factors were selected on the basis of a specific to general modelling strategy (forward selection) governed by the economic issues being examined. The possible labour market outcomes considered are 'employed' (Empd), 'CDEP participant' (CDEP), 'unemployed' (Ue) and 'NILF' (NILF). As the four dependent variables are categorical, rather than continuous or ordinal, multinomial logit regression is the most appropriate model for the analysis.

The multinomial logit coefficients for a particular labour force category relate to the 'log odds ratio', where the odds ratio is the probability of being in that category divided by the probability of being in the reference group, assumed here to be 'employed'. These coefficients may be used to compute probabilities using:

$$\text{Probability } (Y_i = j) = \frac{e^{\beta_j' \mathbf{X}_i}}{\sum_{k=1}^{k=4} e^{\beta_k' \mathbf{X}_i}}$$

where $\boldsymbol{\beta_j}$ is a vector of coefficients relating the variables contained in the vector **X** to the log odds ratio for the j^{th} labour force category relative to the reference labour force category of the employed.

Given the complexity of interpreting the log odds ratios, it is standard to report the variable's marginal effects rather than their coefficients. The marginal effects for

each variable (e.g. married) are derived by subtracting the probabilities associated with the base case (e.g. not married) from the probabilities found for each coefficient (e.g. married). In discussion of each factor's marginal effects, reference to their statistical significance refers to that of the relevant coefficient.

The first model reported in this paper considers the determinants of labour force status separately for males and females. This model includes both those variables reviewed in previous studies (region of residence, age, family characteristics, education, health, culture and crime) and a number of 'new' variables, not incorporated in previous studies for Indigenous Australians[7]. These 'new' variables cover factors relating to health (smoking and alcohol use[8]), culture (attending cultural events and living in homelands) and housing issues. The housing issues covered are living in a house which is: 'overcrowded' (crowding), 'has not had repairs in the last 12 months' (no repairs), 'lacks key household facilities' (facilities) or 'has major structural problems' (structural problems). Housing issues have been included in the present study due to recent policy and academic focus on the potential labour market implications of the poor housing stock available to Indigenous Australians, particularly in remote areas[9]. For full details on each variable, their descriptive statistics, and the omitted category for each set of variables, see Appendix A.

In order to examine the interaction of geography with other determinants of labour force status, following discussion of the analysis described above, the model is re-estimated separately for non-remote and remote areas. Through this process it is possible to observe inter-regional differences in the determinants of labour force outcomes among Indigenous people.

4. Empirical Results

Determinants of Labour Force Status with the Full Sample

Before discussing particular estimates, it is informative to consider whether the sets of variables used in this model are independently significant by conducting likelihood ratio tests. For this purpose, the joint significance of each standard set of factors is

[7]To ensure that the inclusion of this study's 'new' variables did not adversely affect the estimates relating to other variables, sensitivity analysis was performed by conducting separate estimates using a parsimonious model which excluded the 'new' variables. The estimates of this parsimonious model did not differ significantly from the expanded model, suggesting that the 'new' variables inclusion did not adversely affect the estimates.

[8]Hunter and Daly (2008) use variables for alcohol use, but their analysis covers only labour supply among females.

[9]Minister Macklin stated "improved housing is central to our agenda for remote Australia. This is because decent housing is essential for... employment..." (Addressing Disadvantage in Remote Australia 2009).

considered and, as the new variables are of particular interest, variables relating to health, culture and housing issues are tested separately. The results of this test for males, shown in Table 2, reveal that all the variables considered in the expanded model, including those included for the first time in this study, enhance the fit of the model. The results of this process are similar for females (not shown). It is now appropriate to discuss the full results summarised in Tables 3 and 4.

Table 2 – Likelihood Test Procedure, Males

Sets of Variables	Change in Likelihood Ratio	Individual Variables – Health	Change in Likelihood Ratio	Individual Variables – Culture	Change in Likelihood Ratio	Individual Variables – Housing	Change in Likelihood Ratio
Geography	171.43***	Smoker	22.93***	Homelands	12.22***	Crowding	20.96***
Age	68.29***	Disability	34.64***	Mixed household	62.54***	No repairs	4.41*
Family characteristics	92.02***	SAHS	101.79***	Cultural event	77.13***	Facilities	7.23**
Education	150.66***	Alcohol	35.7***	Indigenous language	50.44***	Structural problems	20.11
Arrest	69.79***			Removed	12.41***		
				TSI	4.73*		

Note: Statistical significance based on the chi-squared distribution is indicted by *, ** and *** for p-values of 0.05, 0.01 and 0.001 respectively. *Source:* ABS 2005b.

The results presented in Tables 3 and 4 are largely consistent with those found by the prior studies reviewed in Section 2. In particular, variables related to geography, age, family characteristics, SAHS, disability status, speaking an Indigenous language, living in an ethnically mixed household, having been removed from family, identify as TSI and crime, yield results which closely mirror those found in other studies. Accordingly, the following discussion has been restricted to discussing those factors for which the results found here differ somewhat from previous studies (most notably education) and to analysis of results relating to this study's new variables.

The marginal effects associated with education variables presented in Table 3 are in general weaker than those presented in previous studies. For example, this paper's analysis reveals that completing school has a marginal effect on the probability of employment of only 6.1 and negative 0.3 percentage points for males and females respectively. That is, relative to completing year 10, completing year 12 has virtually no

Table 3 – Marginal Effects of Selected Characteristics on LFS, Males

	NILF	Ue	CDEP	Empd
Base case	0.232	0.166	0.173	0.429
Geography				
Inner regional	-0.013	0.016	0.078	-0.081
Outer regional	0.021	0.028	0.026	-0.075
Remote	-0.082	-0.127	0.381	-0.173
Age				
Age 25-34	0.012	-0.037	-0.091	0.117
Age 35-44	-0.015	-0.045	-0.097	0.157
Age 45-54	0.046	-0.096	-0.096	0.146
Age 55-64	0.228	-0.131	-0.127	0.030
Family				
Married	-0.135	-0.019	-0.018	0.172
One dependant	-0.040	-0.032	0.108	-0.036
Two or three dependants	-0.141	0.038	0.336	-0.232
Four or more dependants	-0.025	0.048	0.174	-0.197
Education				
≤year 9	0.173	-0.025	0.013	-0.161
Year 11 (n.s.)	-0.036	-0.034	0.077	-0.007
Year 12	-0.101	-0.024	0.065	0.061
Certificate	-0.033	-0.081	-0.036	0.150
Degree or diploma	-0.051	0.005	-0.104	0.150
English difficulty	0.116	0.023	0.007	-0.145
Health				
Smoker	0.061	0.049	0.011	-0.121
Disability	0.154	0.000	-0.021	-0.133
Good SAHS	0.029	-0.042	0.017	-0.004
Fair SAHS	0.159	-0.007	-0.016	-0.136
Poor SAHS	0.443	-0.132	-0.017	-0.294
No alcohol use	0.006	0.075	0.026	-0.107
High risk alcohol use	-0.066	0.009	0.073	-0.016
Cultural				
Homelands	-0.017	0.023	0.076	-0.082
Mixed household	-0.043	-0.060	-0.095	0.198
Cultural event	-0.103	-0.055	0.360	-0.203
Indigenous language	0.177	-0.032	0.046	-0.191
Removed	-0.051	0.104	-0.003	-0.049
TSI (n.s.)	-0.080	0.066	0.031	-0.017
Crime				
Arrested	0.003	0.155	0.023	-0.181
Housing				
Crowding	0.071	0.068	-0.057	-0.082
No repairs	-0.002	0.002	0.053	-0.054
Facilities	0.012	-0.066	0.098	-0.044
Structural problems	0.055	0.055	-0.036	-0.074

Note: The base case refers to a hypothetical male with mean characteristics. The marginal effects show the change in th probability of being in the respective labour force category associated with the respective explanatory variable. As the marginal effects in each row sum to zero, if any marginal effect is based on a statistically significant coefficient the other marginal effects in that row are also likely to be statistically significant (Hunter and Gray 1999: 17). Where all the coefficients of a particular variable are statistically insignificant at the 10 per cent significance level this is indicted by "n.s." in parentheses. The sample size is 3275. *Source:* ABS 2005b.

Table 4 – Marginal Effect of Selected Characteristics on LFS, Females

	NILF	Ue	CDEP	Empd
Base case	0.472	0.104	0.099	0.325
Geography				
Inner regional	0.015	0.033	0.034	-0.082
Outer regional	-0.015	0.006	0.069	-0.060
Remote	-0.231	-0.047	0.391	-0.113
Age				
Age 25-34	-0.029	-0.042	-0.010	0.080
Age 35-44	-0.148	-0.065	-0.016	0.229
Age 45-54	-0.087	-0.073	-0.026	0.186
Age 45-64	0.124	-0.103	-0.052	0.031
Family				
Married	0.013	-0.038	0.025	0.000
One dependant	0.126	-0.035	-0.019	-0.072
Two or three dependants	-0.092	0.056	0.232	-0.196
Four or more dependants	0.025	0.068	0.133	-0.226
Education				
≤year 9	0.128	-0.014	-0.019	-0.096
Year 11 (n.s.)	-0.022	-0.004	-0.007	0.034
Year 12	-0.258	0.128	0.133	-0.003
Certificate	-0.156	-0.031	-0.018	0.205
Degree or diploma	-0.317	-0.055	-0.049	0.421
English difficulty	0.080	0.023	0.009	-0.112
Health				
Smoker	0.023	0.040	0.013	-0.076
Disability	0.085	-0.002	0.015	-0.098
Good SAHS	0.071	0.000	0.012	-0.082
Fair SAHS	0.121	0.037	-0.027	-0.130
Poor SAHS	0.310	-0.037	-0.044	-0.229
No alcohol use	0.069	-0.009	0.031	-0.091
High risk alcohol use	-0.008	0.026	0.046	-0.064
Cultural				
Homelands	-0.043	-0.023	0.028	0.038
Mixed household	-0.159	-0.002	-0.031	0.193
Cultural event	-0.103	-0.015	0.114	0.003
Indigenous language	0.092	-0.014	0.023	-0.101
Removed	0.005	0.036	-0.001	-0.039
TSI (n.s.)	0.027	0.008	0.021	-0.056
Crime				
Arrested	0.132	0.049	-0.010	-0.171
Housing				
Crowding	0.043	0.011	0.017	-0.071
No repairs (n.s.)	0.029	-0.020	-0.010	0.001
Facilities (n.s.)	0.062	-0.015	0.010	-0.057
Structural problems	0.006	0.019	0.006	-0.031

Note: The base case refers to an Indigenous female with mean characteristics. The sample size is 4426. *Source:* ABS 2005b.

effect on the employment probability among females and a small effect for males less than one third the strength of the marginal effects associated with factors such as the presence of two or three dependants, four or more dependants, poor health, living in an ethnically mixed household and recent arrest. This contrasts with the far stronger effects identified by previously reviewed studies, which found completing year 12 to be associated with marginal effects of 9.8 to 28.6 percentage points.

The contrast between the present study and those previously reviewed appears to be driven by the use of contrasting reference groups: while this study uses a reference group which has completed year 10 but with no further qualifications, other studies use a more extreme reference group which either left school between years 6 to 9 (Hunter and Gray, 1999, 2001, 2002; Borland and Hunter, 2000) or an unbounded group with less than year 9 or 10 education (Biddle and Webster, 2007; Hunter and Daly, 2008). It is arguable that using these low education levels as a reference group unduly inflates the effect of education variables, since the failure to complete compulsory education may be correlated with other factors, such as social marginalisation or family dysfunction, which are likely to have an independent negative effect on the probability of employment. Despite this observation, it should be noted that this paper's results do indicate that completing non-school qualifications has a large positive effect on the probability of employment, particularly among Indigenous females.

Turning to the new variables, we start with the implications of alcohol use. Relative to the omitted category of low or moderate alcohol consumption, abstinence from alcohol is associated with a decline in employment for both genders. Relative to the same reference group, high alcohol use among females is associated with a negative marginal effect on employment probability of 6.4 percentage points, but had no statistically significant relationship with labour force status among males. Perhaps contrary to popular perception, this result suggests that alcohol abuse among Indigenous Australians has a weaker effect on employment probability than among other populations for which similar analyses have been conducted. For example, one study using data for England has found that problem drinking is associated with a decline in "the probability of working by between 0.07 and 0.31, depending on the exact definition of problem drinking and choice of instrument" (MacDonald and

Shields, 2004: 147) – significantly higher than the effect found here for Indigenous Australians. However, it is important to recall the significant caveat for this papers results that, as the survey excludes residents of non-private dwellings (who are far less likely to be employed and far more likely to abuse alcohol (Chikritzhs and Brady, 2006: 243)) the results presented here will understate the association between alcohol abuse and the labour force statuses of Indigenous Australians. This analytical deficiency cannot be addressed without improved data on this topic.

Ceteris paribus, identifying as a smoker is associated with a negative marginal effect on the probability of employment of 12.1 and 7.6 percentage points for males and females, respectively. This is a large effect, for example, similar to the marginal effect of having a disability. Invoking the human capital framework, one possible explanation is that smoking may reduce employment indirectly given its documented negative impact on health. However, as the model used in this study includes other measures for health status, the scope for this effect is limited. Another possibility is that, given the documented correlation between smoking and illicit drug abuse (Sullivan and Covey, 2002: 704), the smoking variable may capture some of the unmeasured negative labour market implications associated with illicit drug use.

Both the new cultural variables included in this study tend to have a statistically significant relationship with labour force status. In particular, having attended a cultural event in the last 12 months is associated with a 20.3 percentage point decline in the probability of employment for males, but no statistically significant relationship with labour force status among females. The decline in employment among males is primarily driven by a 36 percentage point increase in CDEP participation. As attendance and participation in cultural activities may have been counted as CDEP work (Hudson, 2008: 2), it is likely that this result reflects the fact that attending cultural events and CDEP participation are jointly determined.

Among males, 'living in homelands' has a negative marginal effect on employment of 8.2 percentage points, with a corresponding increase in CDEP participation of 7.6 percentage points. In contrast, for females, this factor has a small positive effect on both employment and CDEP participation. These results are of interest in part because of the prognosis presented by some that a major contributor to the poor employment outcomes among Indigenous people is their relatively low proclivity to

leave their 'homelands' and relocate for employment purposes (Hughes, 2007). Although the results presented here do indicate that living in 'homelands' has a negative association with employment for males, if not for females, the strength of this relationship is not so strong as to suggest that the choice to live in one's 'homelands' is associated with a major labour market penalty once personal characteristics are controlled for.

Of the housing quality variables, only 'crowding' and 'structural problems' consistently have a statistically significant association with labour force status among males and females. Both of these are associated with a decline in employment and participation, an effect which is strongest for males. As noted in Section 2, a number of studies have suggested that poor housing may negatively affect Indigenous Australian's association with the labour market, primarily because of its negative implications for health and educational attainment (Taylor, 2008: 53). However, as the present study controls for education and health, it is arguable that these results show that crowding and structural problems have a direct relationship with poor labour market outcomes.

A possible concern with this interpretation is that the relationship between housing issues and labour force status may be driven by the fact that having a job allows one to finance more adequate housing, meaning housing issues would be endogenous to labour force status. However, as only 25 per cent of Indigenous people live in owner-occupied homes (Biddle, 2008: 10), housing quality for the majority of the Indigenous community is likely to be independent of their own finances. Therefore, these results could well indicate that poor housing has a direct negative effect on an Indigenous person's chances of acquiring and retaining employment, a conclusion which is congruent with prior assumptions and highlights the potential benefits associated with the recent policy focus on improved housing facilities for Indigenous Australians (Addressing Disadvantage in Remote Australia, 2009).

Before concluding this sub-section it is useful to briefly consider how these results can be used to infer the determinants of supply and demand for Indigenous labour. Though attempts to identify the separate impact of labour supply or demand are difficult as any particular labour market outcome invariably reflects the interaction of these factors, the results presented above are sufficient for some tentative

conclusions. In particular, it is apparent that males who are either: aged 55 to 64, have less than year 10 education, have difficulty speaking English, have a disability or are in fair or poor health, are all much less likely to be labour force participants, implying that these factors impinge on labour supply. In contrast being married, having two or three dependants or attending cultural events has a very strong positive effect on labour supply among males. Similar results are found for women, except that dependants have a mixed effect on labour supply, while non-school education and living in an ethnically mixed household have stronger positive effects on female labour supply. These results confirm that a range of variables relating to demographic characteristics, culture and human capital are important determinants of labour supply among Indigenous people.

Though drawing inference in relation labour demand is difficult, not least because of the role of CDEP, it is likely that those variables which primarily impact on the relative likelihood of unemployment and employment do so by influencing labour demand. For example, having been arrested decreases employment and increases unemployment, but has no effect on NILF and CDEP. This suggests that this variable has only a limited effect on the desire for mainstream employment (labour supply), but significantly decreases the demand for labour. This may imply that further emphasis on employment programs to assist criminal offenders may be particularly useful in increasing employment outcomes.

In composite this section highlights the wide range of variables which have a statistically significant relationship with the probability of employment. For both males and females, some of the strongest positive marginal effects on the probability of employment are associated with being aged 35 to 44 and living in an ethnically mixed household. Completing a degree, diploma or certificate also has a strong positive effect on employment probability, particularly for females. Of the variables to have a negative impact, among the strongest are having two or three dependants, four or more dependants, poor SAHS and having been arrested – all of which have a negative marginal effect on the probability of employment of approximately 20 percentage points for males and females. This section, therefore, highlights that initiatives to increase employment among Indigenous people are well served by considering not only those factors related to human capital, such as education and

health, but also a range of socio-cultural variables, such as the labour market implications of dependants and interactions with the criminal justice system. The very strong positive effect associated with living in an ethnically mixed household is also of interest and is explored further in the following section.

Determinants of Labour Force Status in Non-Remote and Remote areas

Disaggregating the sample between non-remote and remote areas may offer a better understanding of the determinants of labour force status in these regions, and is necessary to identify systematic differences between them. This is important given recent academic and policy focus on the "...growing disparity between Indigenous people living in remote areas and both Indigenous and non-Indigenous Australians living in non-remote areas..." (Gray and Chapman, 2006: 118). Indeed, this study's finding that male residents of remote areas were 17.3 percentage points less likely to be employed than those in major cities (Table 3) again demonstrates this significant inter-regional contrast. The only previous study to consider inter-regional variations in the determinants of labour force status is Hunter (2004). However, as Hunter (2004) relied on the less detailed Census data, the present study is able to identify a number of hitherto unobserved trends. In the interest of brevity, only those results which reveal significant variations between non-remote and remote areas are discussed below, meaning the variable sets for family characteristics and housing issues are omitted in the following discussion.

The results presented in Table 5 reveal that for both genders the probability of employment increases more strongly with age in remote areas – a result consistent with previous findings (Hunter, 2004: 71). This apparent inter-regional difference is driven by the particularly low rates of employment among young Indigenous people in remote areas. It is also notable that while increased employment with age in non-remote areas is accompanied by a significant decline in unemployment, in remote areas it is CDEP participation which declines most strongly. This result is driven by the significant presence of young people among the unemployed in non-remote areas compared with their heavy reliance on CDEP in remote areas.

Table 5 – Marginal Effects of Age in Non-Remote and Remote Areas

	Non-Remote				Remote			
Males	NILF	Ue	CDEP	Empd	NILF	Ue	CDEP	Empd
Base case	0.223	0.202	0.066	0.509	0.255	0.075	0.448	0.223
Age 25-34	0.029	-0.052	-0.043	0.066	0.001	-0.009	-0.182	0.190
Age 35-44	0.021	-0.073	-0.050	0.102	-0.049	-0.003	-0.165	0.217
Age 45-54	0.108	-0.118	-0.051	0.061	-0.022	-0.045	-0.186	0.254
Age 55-64	0.266	-0.162	-0.054	-0.050	0.190	-0.055	-0.296	0.161
Females								
Base case	0.472	0.127	0.030	0.371	0.470	0.044	0.285	0.201
Age 25-34	-0.124	-0.060	-0.003	0.188	-0.233	-0.031	-0.061	0.326
Age 35-44	-0.029	-0.090	-0.014	0.132	-0.087	-0.038	-0.086	0.211
Age 45-54	--	--	--	--	-0.033	-0.042	-0.105	0.181
Age 55-64	-0.030	-0.037	-0.001	0.067	-0.114	-0.011	0.028	0.096

Note: The base case refers to a hypothetical person with the mean characteristics which prevail in non-remote and remote areas, respectively. The base case probabilities also apply to Tables 6-11. For males the sample size was 1755 and 1520 for non-remote and remote areas, respectively. For females the corresponding sample sizes were 2499 and 1927. *Source*: ABS 2005b.

The results for education and English skills, presented in Table 6, reveal that these variables generally have stronger effects on the probability of employment in non-remote areas. For example, in non-remote areas, leaving school before completing year 10 and English difficulty have negative marginal effects on the probability of employment of over 20 percentage points among males. In contrast, in remote areas, leaving school early had only a small effect on the probability of employment (8.1 percentage points), while English difficulty did not have a statistically significant relationship with any particular labour market outcome. Likewise, education tends to be associated with stronger effects on labour force participation in non-remote areas. The only exceptions to this trend is that for males having a certificate is associated with a significantly stronger positive effect on employment in remote areas (23.3 percentage points) than in non-remote areas (10.4 percentage points), while for females all non-school education variables have stronger effects in remote areas.

The regional variations in the effects of education shown here conflict with the findings by Hunter (2004), cited in Section 2, that education consistently has stronger effects in remote areas. The omission of cultural factors in Hunter (2004), due to data limitations, may contribute to this discrepancy since not accounting for the negative correlation between education levels and the measures of cultural

attachment used in this study, (tests reveal, ABS, 2005b) leads to an inflated estimate of the returns to education in remote, relative to non-remote, areas.

Table 6 – Marginal Effects of Education and English Skills in Non-Remote and Remote Areas

	Non-Remote					Remote			
Males	NILF	Ue	CDEP	Empd		NILF	Ue	CDEP	Empd
≤year 9	0.246	-0.051	0.006	-0.201		0.069	0.009	0.003	-0.081
Year 11 (n.s.)	-0.010	-0.056	0.052	0.014	(n.s.)	-0.086	0.014	0.072	-0.001
Year 12	-0.135	-0.064	0.243	-0.043	(n.s.)	-0.076	0.210	-0.170	0.036
Certificate	0.017	-0.113	-0.008	0.104		-0.137	0.005	-0.101	0.233
Degree or diploma (n.s.)	-0.039	-0.034	-0.044	0.118	(n.s.)	0.028	0.056	-0.169	0.085
English difficulty	0.186	0.031	0.016	-0.234	(n.s.)	0.014	0.009	-0.047	0.024
Females									
≤year 9	0.185	-0.046	-0.012	-0.127		0.227	-0.019	-0.100	-0.108
Year 11 (n.s.)	-0.003	-0.001	0.006	-0.002		0.008	-0.024	-0.040	0.056
Year 12	-0.220	0.099	0.055	0.067		-0.134	0.169	-0.047	0.012
Certificate	-0.071	0.012	0.001	0.057		-0.134	-0.027	-0.058	0.219
Degree or diploma	-0.330	-0.091	-0.027	0.448		-0.393	-0.027	-0.165	0.585
English difficulty	0.072	0.069	-0.003	-0.138	(n.s)	-0.013	0.009	0.005	-0.001

Source: ABS 2005b.

Another notable trend is the consistency with which increased education reduces unemployment in non-remote areas, but increases unemployment in remote areas. Further, CDEP participation declined significantly in association with education in remote areas, but is relatively insensitive to increased education in non-remote areas.

Table 7 – Marginal Effects of Health Factors in Non-Remote and Remote Areas

	Non-Remote					Remote			
Males	NILF	Ue	CDEP	Empd		NILF	Ue	CDEP	Empd
Smoker	0.068	0.054	0.012	-0.133		0.027	0.028	0.017	-0.072
Disability	0.188	-0.003	-0.021	-0.163		0.114	-0.005	-0.025	-0.084
Good SAHS	0.069	-0.066	0.006	-0.009	(n.s.)	-0.015	0.009	0.025	-0.019
Fair SAHS	0.214	-0.017	-0.024	-0.172	(n.s.)	-0.008	0.028	0.016	-0.036
Poor SAHS	0.557	-0.176	-0.040	-0.341		0.233	-0.008	-0.062	-0.163
No alcohol	-0.014	0.106	0.025	-0.118		0.016	0.027	0.022	-0.064
High alcohol	-0.041	0.015	0.044	-0.018		-0.108	0.010	0.073	0.025
Females									
Smoker	0.047	0.082	-0.004	-0.124		-0.001	0.023	0.059	-0.081
Disability	0.126	0.032	-0.004	-0.154		0.024	0.000	0.079	-0.102
Good SAHS	0.068	0.039	-0.003	-0.104	(n.s.)	0.023	0.007	0.001	-0.031
Fair SAHS	0.146	-0.006	-0.014	-0.126		0.014	0.086	-0.084	-0.016
Poor SAHS	0.387	-0.082	-0.019	-0.286		0.212	0.012	-0.114	-0.110
No alcohol	0.083	0.036	-0.012	-0.106		0.000	-0.007	0.113	-0.106
High alcohol	-0.026	0.102	-0.009	-0.067		-0.099	-0.003	0.199	-0.097

Source: ABS 2005b.

Though variables related to health, covered in Table 7, tend to have the same sign in both areas, the magnitudes of these effects on the probability of employment are stronger in non-remote areas than in remote areas. For example, the decrease in employment associated with smoking, having a disability, poor SAHS and not drinking, is roughly twice as large in non-remote areas among males. Similarly, the decline in labour market participation associated with these factors is also stronger in non-remote areas for both genders.

For Indigenous males, of the cultural factors included in this study shown in Table 8, the effect associated with living in a 'mixed household' differs most significantly between non-remote and remote areas. The marginal effect of this variable is almost twice as strong in relation to employment probability and ten times as strong in relation to CDEP participation in remote areas, relative to non-remote areas. A number of mechanisms were suggested in Section 2 through which living in a mixed household may impact positively on the probability of employment. However, it was also noted that the statistical association between labour force status and living in a mixed household could be driven by the aggregation of remote and very remote area data, since both mixed households and employment rates are negatively correlated

with remoteness. The results presented above are useful in determining the relative strength of these alternate hypotheses.

Table 8 – Marginal Effects of Cultural Factors in Non-Remote and Remote Areas

	Non-Remote					Remote			
Males	NILF	Ue	CDEP	Empd		NILF	Ue	CDEP	Empd
Homelands	-0.019	0.055	0.033	-0.068		-0.042	-0.006	0.118	-0.069
Mixed household	-0.061	-0.085	-0.032	0.178		0.014	0.005	-0.320	0.302
Cultural event	-0.052	-0.076	0.270	-0.141		-0.144	-0.017	0.249	-0.088
Indigenous language	0.173	-0.005	-0.001	-0.167		0.085	-0.040	0.090	-0.136
Removed	-0.022	0.148	-0.027	-0.099		-0.050	-0.025	0.041	0.034
TSI	-0.087	0.200	-0.056	-0.056		-0.095	-0.070	0.218	-0.053
Females									
Homelands	-0.169	0.001	0.014	0.154		0.007	-0.024	0.032	-0.016
Mixed household	-0.163	-0.033	-0.018	0.215		-0.145	0.000	-0.055	0.200
Cultural event	-0.125	-0.014	0.190	-0.051		-0.079	0.001	0.159	-0.081
Indigenous language	-0.009	-0.034	-0.012	0.055		0.075	-0.001	0.025	-0.098
Removed	-0.003	0.073	-0.008	-0.062	(n.s.)	-0.110	-0.018	0.110	0.018
TSI	--	--	--	--		-0.065	-0.015	0.156	-0.076

Source: ABS 2005b.

First, as living in a mixed household does have a significantly stronger effect in remote areas it is possible that the marginal effect of this variable is inflated by its unmeasured correlation with remoteness. However, it is also possible that the labour market benefits of living in a mixed household are simply stronger in remote areas. Moreover, as the discussed data limitations do not apply to non-remote areas, the fact that living in a mixed household continues to be associated with increased employment in these areas demonstrates that this factor does have positive labour market implications even where data limitations are not an issue.

Importantly, if living in an ethnically mixed household can be taken as a rough proxy for greater integration with non-Indigenous society, then this result suggests that such integration is associated with a higher probability of employment. However, the mechanism for this increase is unclear. As noted in Section 2, there are a number of reasons why living in an ethnically mixed household may be more conducive to being employed. However, it is also possible that the causality runs in the opposite direction: having employment may increase the probability of living in a mixed

household, through, for example, higher rates of 'out marriage' among Indigenous people in employment.

It was also noted in Section 2 that, as for mixed households, the labour market effects associated with speaking an Indigenous language may reflect the correlation between this factor and unmeasured remoteness. However, as the negative effect on employment for males of speaking an Indigenous language is actually stronger in non-remote areas, it seems that this measure for cultural attachment is also associated with negative labour market implications, at least for males, distinct from complications relating to unmeasured correlation with remoteness. This suggests that the lower employment rates among males who speak an Indigenous language are attributable to the preferences among this group for traditional activities outside the mainstream labour market (as demonstrated by higher rates of NILF and CDEP participation) or the greater difficulty in gaining employment experienced by more traditional people (Altman *et al*., 2005: 21).

In relation to arrest, Table 9 reveals that among males arrest has a significantly weaker effect on employment in remote areas. In both regions, participation rates are found to be relatively insensitive to arrest, as was the case when the sample was considered in aggregate. These results are similar to those for females, except that in both regions female participation rates fall significantly in association with arrest.

Table 9 – Marginal Effects of Arrest in Non-Remote and Remote Areas

	Non-Remote				Remote			
Males	NILF	Ue	CDEP	Empd	NILF	Ue	CDEP	Empd
Arrested	0.019	0.190	-0.011	-0.198	-0.014	0.066	0.070	-0.123
Females								
Arrested	0.078	0.144	-0.007	-0.214	0.160	0.000	-0.090	-0.070

Source: ABS 2005b.

One trend revealed by this section is that in addition to arrest, other variables relating to human capital variables, such as education and health, tend to be associated with a weaker marginal effect on the probability of employment in remote areas relative to non-remote areas. This is an interesting result with implications which are discussed at the end of the following section.

Section 4 has extended the analysis of Indigenous labour force status by considering new variables and examining variations in determinants between non-remote and remote areas. A number of trends emerge from this analysis, the implications of which are discussed in the following section.

Implications

An important aspect of the Indigenous labour market is the apparent role of the CDEP as a substitute to unemployment in remote areas. As observed by Biddle and Webster (2007):

> Those who live in Remote or Very Remote regions are less likely to be unemployed than those in major cities or regional areas... [meaning] that in these areas the CDEP scheme appears to be providing an alternative to being unemployed (Biddle and Webster, 2007: 31).

This dynamic is further explored by the disaggregated analysis for non-remote and remote areas. Importantly, the results confirm prior assumptions that where the CDEP is widely available (i.e. remote areas) it is utilised by individuals who, given their personal characteristics, otherwise are more likely to be unemployed, rather than employed. That is, factors which increase unemployment in non-remote areas, such as young age or having little education, significantly increase CDEP participation in remote areas and have only a minor effect on unemployment.

The similarity in personal characteristics between CDEP participants in remote areas and the unemployed in non-remote areas has implications for ongoing policy initiatives to dismantle the old CDEP system[10]. In particular, the results suggest that as the CDEP program is scaled back in remote areas the formerly CDEP employed would predominantly transition to unemployment rather than mainstream employment. That is, given the personal characteristics of remote area CDEP recipients, even if these individuals relocated to non-remote areas, they would be reasonably expected to disproportionately join the already unemployed. Of course, this description is based on the current static analysis: if the employment prospects of Indigenous people markedly improved, due either to increased human capital or increased returns to existing human capital[11], then this equation would be altered. However, such a development would be a significant departure from the recent

[10] As of July 2009 the CDEP is no longer available to residents of non-remote locations "where the economy is well established" (CDEP, 2009). CDEP participants in remote areas will only receive wages until July 2011, after which they will be eligible for other forms of income support until employment is acquired (CDEP, 2009).

[11] Attempts to increase such returns include the use of innovative employment programs (SCRGSP, 2009: 497-9).

experience of limited success in ongoing efforts to improve employment outcomes (Altman *et al*., 2008). In this case, to the extent that the CDEP yields superior outcomes to unemployment (Altman and Sanders, 2000; Hunter, 2009), the CDEP's apparent impending demise may be of some concern.

Another important result of Section 4 is the evidence of a consistent negative association between the probability of employment and attachment to 'Indigenous culture', as measured by proxy variables such as speaking an Indigenous language, living in an ethnically mixed household, participation in cultural events and living in homelands. While this conclusion conflicts with the tentative assertion that culture "should not be seen as a barrier but as a potential part of the strategy to enhance employment outcomes" (Dockery, 2009a: 29), it is consistent with results cited in Section 2, such as those in Hunter and Gray (2001) and Borland and Hunter (2000). Indeed, the results of the present paper appear to support the suggestion that "the variables that capture the access of an individual to traditional lifestyles, ...are associated with significant reductions in labour supply and declines in the desire to work in the mainstream labour market" (Hunter and Gray, 2002: 24). However, this conclusion requires some qualification, as there is some danger that utilising the above variables as proxies for cultural attachment may yield misleading conclusions. For example, living in an ethnically mixed household is clearly a better proxy measure for the strength of an individual's association or integration with non-Indigenous society, rather than their attachment to Indigenous culture. Therefore, these results should not be interpreted as straightforward measures of cultural attachment, but rather may be viewed as reflecting a range of socio-cultural factors.

Despite the above qualifications, the results of Section 4 imply there is some basic tension between mainstream employment and our measures of cultural attachment. Likewise, there is evidence suggesting that greater integration with non-Indigenous society may have significant positive labour market implications. If this reality is driven by the preference of more traditional or culturally connected Indigenous people to remain outside the labour force or remain as CDEP participants, then this underlying disinclination towards mainstream employment may significantly impinge on the success of attempts to dramatically increase employment rates among the Indigenous community. Indeed, the conclusion that people who are more strongly

connected with the practices of a traditional culture, far removed from the norms of a post-industrial society and economy, are less inclined to embrace mainstream employment should perhaps be no great surprise.

The apparent tension between mainstream employment and cultural attachment also points to the possibility that acquiring mainstream employment may be associated with some trade-off with traditional culture and obligations for some people. If this is so, then in light of recent evidence suggesting that strong cultural connections are associated with significant benefits for Indigenous Australians (Dockery, 2009a, 2009b), the welfare effects of higher rates of mainstream employment may not be as unambiguously positive as expected by many commentators.

Finally, it was noted at the end of Section 4 that the probability of employment responds more strongly to variables relating to education, health and arrest in non-remote areas, than in remote areas. This finding can be interpreted as indicating the salience of SLM theory to the Indigenous labour market in remote areas, as it is consistent with SLM theory's expectations of weak returns to human capital. This is also supported by the finding that cultural factors generally have a stronger effect in remote areas, a result anticipated by SLM theory's emphasis on socio-cultural factors as key determinants of labour market outcomes. This conclusion implies that the employment prospects of Indigenous people in remote areas may be particularly difficult to enhance through a narrow focus on human capital accumulation and will require consistent attention to a range of complex socio-cultural realities.

6. Conclusion

This paper makes several key contributions. First, by updating previous research and incorporating a number of 'new' variables, it confirms the importance of a wide array of geographic, demographic, cultural and human capital related factors as determinants of labour supply and employment prospects among Indigenous Australians. The only notable difference between these results and prior research is that variables for education generally have a weaker effect on employment prospects in this study, a discrepancy which appears to be driven by the use of, arguably inappropriately, low education levels as the omitted category in prior studies. Importantly, this analysis highlights the particularly strong association between employment and a number of socio-cultural factors, such as having dependants,

speaking an Indigenous language, living in an ethnically mixed household and having been arrested. This points to the complex reality of Indigenous employment disadvantage and should be heeded as caution against 'silver bullet' solutions of focusing on one set of favoured issues.

The paper's disaggregation of its analysis between non-remote and remote areas also demonstrated previously unidentified inter-regional variations in the determinants of labour force status. Importantly, this analysis revealed a significantly lower return to some standard measures of human capital, such as education and health, in remote areas.

The implications of these results were considered in Section 5. In particular, it was noted that the apparent substitution between CDEP and unemployment suggests that ongoing reductions to the CDEP's availability may lead to a stronger increase in unemployment, rather than employment, a result supporting the contentions of other analysts (Altman and Jordan, 2009; Altman *et al*., 2005). Section 5 also considers the evidence implying an inverse relationship between proxy variables for cultural attachment and mainstream employment. This apparent tension identifies the difficulty inherent in dramatically increasing employment rates among some sections of the Indigenous community. Finally, it was noted that the analysis also reveals evidence suggesting the relevance of SLM theory to the Indigenous labour market in remote areas, a result which further highlights the difficulty of driving enhanced employment outcomes across the Indigenous community through a focus on human capital alone.

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Appendix A. Description and Descriptive Statistics, Explanatory Variables

Table A.1 Description of explanatory variables for LFS and earnings models

Variable	Description (all variables are dichotomous)
Geography	
Major cities	omitted category, residence in a major cities
Inner regional	resident of inner regional area
Outer regional	resident of outer regional area
Remote	resident of remote or very remote area
Age	
Age 15-24	omitted category, for those aged 15 to 24
Age 25-34	those aged 25 to 34 years
Age 35-44	those aged 35 to 44 years
Age 45-54	those aged 45 to 54 years
Age 55-64	those aged 55 to 64 years
Family	
Unmarried	omitted category, for social marital status of unmarried
Married	for a social marital status of married
No dependants	omitted category, for those no dependants
One dependant	for those with one dependant
Two or three dependants	for those with two or three dependants
Four or more dependants	for those with four or more dependants
Education	
≤year 9	highest educational attainment year 9 or lower
Year 10	omitted category, highest educational attainment year 10
Year 11	highest educational attainment year 11
Year 12	highest educational attainment year 12
Certificate	highest educational attainment a certificate
Degree or diploma	highest educational attainment a diploma, degree or higher
No English difficulty	omitted category, no difficulty in communicating in English
English difficulty	difficulty in communicating in English
Health	
Non-smoker	omitted category, does not smoke
Smoker	occasional or regular smoker
No disability	omitted category, no disability reported
Disability	reported a disability
excellent/very good SAHS	omitted category, reported 'excellent' or 'very good' SAHS
Good SAHS	reported 'good' SAHS
Fair SAHS	reported 'good' SAHS
Poor SAHS	reported 'good' SAHS
No alcohol	reported no alcohol consumption in the last two weeks
Low/ medium alcohol	omitted category, 'low' or 'medium' risk alcohol consumption in the last two weeks
High alcohol	reported 'high' risk alcohol consumption in the last two weeks

Cultural factors	
Not live in homelands	omitted category, where the individual does not live on homelands
Homelands	Where the individual lives on their homelands
Not mixed household	omitted category, where all household occupants are identified as Indigenous
Mixed household	at least one household occupants is non-Indigenous
No cultural event	omitted category, has not attended a cultural event in the last 12 months
Cultural event	has attended a cultural event category
No indigenous language	omitted category, does not speak an Indigenous language
Indigenous language	speaks an indigenous language
Not removed	omitted category, not removed from natural family
Removed	removed from natural family
Not TSI	omitted category, does not claim Torres Strait Islander heritage
TSI	claims Torres Strait Islander heritage
Crime	
Not arrested	omitted category, not arrested in the last five years
Arrested	arrested in the last five years
Housing Issues	
No crowding	omitted category, lived in a house without overcrowding
Crowding	lived in a house with overcrowding
Repairs	omitted category, repairs had been carried out in the last 12 months
No repairs	repairs had not been carried out in the last 12 months
Not lacking facilities	omitted category, not lacking facilities to wash people and clothes, prepare food and working sewerage
Facilities	lacking at least one set of essential facilities described above
No structural problems	omitted category, no structural problems reported
Structural problems	structural problems reported

Table A.2 Descriptive statistics for explanatory variables in the LFS model, Males

	All regions		Non-remote		Remote	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Geography						
Major cities	0.298	0.457	0.415	0.493		
Inner regional	0.201	0.401	0.280	0.449	--	--
Outer regional	0.219	0.414	0.305	0.461	--	--
Remote	0.281	0.450	--	--	--	--
Age						
Age 15-24	0.246	0.430	0.236	0.425	0.270	0.444
Age 25-34	0.283	0.451	0.284	0.451	0.282	0.450
Age 35-44	0.232	0.422	0.238	0.426	0.215	0.411
Age 45-54	0.162	0.369	0.165	0.371	0.156	0.363
Age 55-64	0.077	0.267	0.077	0.266	0.078	0.268
Family						
Unmarried	0.451	0.498	0.462	0.499	0.425	0.495
Married	0.549	0.498	0.538	0.499	0.575	0.495
No dependants	0.415	0.493	0.462	0.499	0.294	0.456
One dependant	0.155	0.362	0.170	0.376	0.116	0.321
Two or three dependants	0.284	0.451	0.276	0.447	0.307	0.461
Four or more dependants	0.146	0.353	0.092	0.289	0.283	0.450
Education						
No English difficulty	0.874	0.332	0.900	0.300	0.807	0.395
English difficulty	0.126	0.332	0.100	0.300	0.193	0.395
≤year 9	0.348	0.476	0.318	0.466	0.425	0.495
Year 10	0.239	0.427	0.231	0.422	0.260	0.439
Year 11	0.075	0.263	0.071	0.257	0.084	0.277
Year 12	0.125	0.330	0.129	0.335	0.113	0.316
Certificate	0.167	0.373	0.192	0.394	0.103	0.305
Degree or diploma	0.047	0.211	0.059	0.236	0.015	0.123
Health						
Non-smoker	0.425	0.494	0.448	0.497	0.365	0.482
Smoker	0.575	0.494	0.552	0.497	0.635	0.482
No disability	0.636	0.481	0.622	0.485	0.673	0.469
Disability	0.364	0.481	0.378	0.485	0.327	0.469
excellent/very good SAHS	0.463	0.499	0.462	0.499	0.466	0.499
Good SAHS	0.300	0.458	0.286	0.452	0.336	0.472
Fair SAHS	0.174	0.379	0.188	0.391	0.138	0.345
Poor SAHS	0.063	0.242	0.064	0.244	0.060	0.238
No alcohol	0.386	0.487	0.338	0.473	0.508	0.500
Low/ medium alcohol	0.297	0.457	0.354	0.478	0.152	0.359
High alcohol	0.317	0.465	0.307	0.462	0.340	0.474
Cultural factors						
Not mixed household	0.756	0.429	0.813	0.390	0.610	0.488
Mixed household	0.244	0.429	0.187	0.390	0.390	0.488
Not mixed household	0.615	0.487	0.499	0.500	0.911	0.285
Mixed household	0.385	0.487	0.501	0.500	0.089	0.285
No cultural event	0.361	0.480	0.451	0.498	0.133	0.339
Cultural event	0.639	0.480	0.549	0.498	0.867	0.339
No indigenous language	0.783	0.412	0.905	0.294	0.471	0.499
Indigenous language	0.217	0.412	0.095	0.294	0.529	0.499

Not removed	0.919	0.273	0.917	0.276	0.924	0.264
Removed	0.081	0.273	0.083	0.276	0.076	0.264
Not TSI	0.963	0.189	0.974	0.159	0.935	0.247
TSI	0.037	0.189	0.026	0.159	0.065	0.247
Crime						
Not arrested	0.735	0.442	0.746	0.435	0.706	0.456
Arrested	0.265	0.442	0.254	0.435	0.294	0.456
Housing Issues						
No crowding	0.766	0.424	0.859	0.348	0.527	0.499
Crowding	0.234	0.424	0.141	0.348	0.473	0.499
Repairs	0.644	0.479	0.686	0.464	0.536	0.499
No repairs	0.356	0.479	0.314	0.464	0.464	0.499
No structural problems	0.906	0.292	0.954	0.209	0.782	0.413
Structural problems	0.094	0.292	0.046	0.209	0.218	0.413
Not lacking facilities	0.611	0.488	0.674	0.469	0.450	0.498
Facilities	0.389	0.488	0.326	0.469	0.550	0.498

Source: ABS 2005b.

Table A.3 Descriptive statistics for explanatory variables in the LFS model, Females

Variable	All regions Mean	Std Dev	Non-remote Mean	Std Dev	Remote Mean	Std Dev
Geography						
Major cities	0.314	0.464	0.432	0.495	--	--
Inner regional	0.187	0.390	0.256	0.437	--	--
Outer regional	0.227	0.419	0.312	0.463	--	--
Remote	0.272	0.445	--	--	--	--
Age						
Age 15-24	0.232	0.422	0.222	0.416	0.257	0.437
Age 25-34	0.294	0.456	0.296	0.457	0.289	0.454
Age 35-44	0.234	0.423	0.236	0.425	0.227	0.419
Age 45-54	0.158	0.364	0.246	0.431	0.147	0.355
Age 55-64	0.083	0.276	--	--	0.079	0.270
Family						
Unmarried	0.518	0.500	0.547	0.498	0.440	0.497
Married	0.482	0.500	0.453	0.498	0.560	0.497
No dependants	0.221	0.456	0.231	0.471	0.193	0.391
One dependant	0.195	0.396	0.218	0.413	0.132	0.339
Two or three dependants	0.344	0.475	0.330	0.470	0.380	0.486
Four or more dependants	0.169	0.375	0.121	0.326	0.299	0.458
Education						
≤year 9	0.307	0.461	0.263	0.440	0.425	0.494
Year 10	0.277	0.439	0.287	0.452	0.250	0.433
Year 11	0.106	0.307	0.106	0.308	0.103	0.304
Year 12	0.130	0.336	0.138	0.345	0.107	0.309
Certificate	0.102	0.303	0.118	0.322	0.061	0.240
Degree or diploma	0.078	0.269	0.088	0.283	0.054	0.226
No English difficulty	0.866	0.341	0.895	0.307	0.789	0.408
English difficulty	0.134	0.341	0.105	0.307	0.211	0.408
Health						
Non-smoker	0.460	0.498	0.457	0.498	0.471	0.499
Smoker	0.540	0.498	0.543	0.498	0.529	0.499
No disability	0.641	0.480	0.643	0.479	0.638	0.481
Disability	0.359	0.480	0.357	0.479	0.362	0.481
excellent/very good SAHS	0.405	0.499	0.397	0.489	0.427	0.495
Good SAHS	0.358	0.479	0.347	0.476	0.387	0.487
Fair SAHS	0.169	0.375	0.183	0.386	0.132	0.339
Poor SAHS	0.068	0.252	0.074	0.262	0.053	0.225
No alcohol	0.595	0.491	0.563	0.496	0.680	0.467
Low/ medium alcohol	0.199	0.359	0.233	0.423	0.108	0.310
High alcohol	0.206	0.404	0.203	0.403	0.213	0.409
Cultural factors						
Not live in homelands	0.795	0.403	0.855	0.353	0.637	0.481
Homelands	0.205	0.403	0.145	0.353	0.363	0.481
Not mixed household	0.672	0.469	0.585	0.493	0.906	0.292
Mixed household	0.328	0.469	0.415	0.493	0.094	0.292
No cultural event	0.287	0.452	0.348	0.476	0.124	0.329
Cultural event	0.713	0.452	0.652	0.476	0.876	0.329

No indigenous language	0.795	0.404	0.916	0.278	0.472	0.499
Indigenous language	0.205	0.404	0.084	0.278	0.528	0.499
Not removed	0.907	0.290	0.890	0.312	0.952	0.214
Removed	0.093	0.290	0.110	0.312	0.048	0.214
Not TSI	0.968	0.175	--	--	0.950	0.218
TSI	0.032	0.175	--	--	0.050	0.218
Crime						
Not arrested	0.894	0.308	0.887	0.317	0.915	0.279
Arrested	0.106	0.308	0.113	0.317	0.085	0.279
Housing Issues						
No crowding	0.739	0.439	0.834	0.372	0.485	0.500
Crowding	0.261	0.439	0.166	0.372	0.515	0.500
Repairs	0.660	0.474	0.698	0.459	0.558	0.497
No repairs	0.340	0.474	0.302	0.459	0.442	0.497
No structural problems	0.913	0.282	0.967	0.179	0.768	0.422
Structural problems	0.087	0.282	0.033	0.179	0.232	0.422
Not lacking facilities	0.592	0.491	0.667	0.471	0.393	0.489
Facilities	0.408	0.491	0.333	0.471	0.607	0.489

Source: ABS 2005b.

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