CENTRE FOR ABORIGINAL ECONOMIC POLICY RESEARCH

THE AUSTRALIAN NATIONAL UNIVERSITY

# The Geography and Demography of Indigenous Migration: Insights for Policy and Planning

N. Biddle

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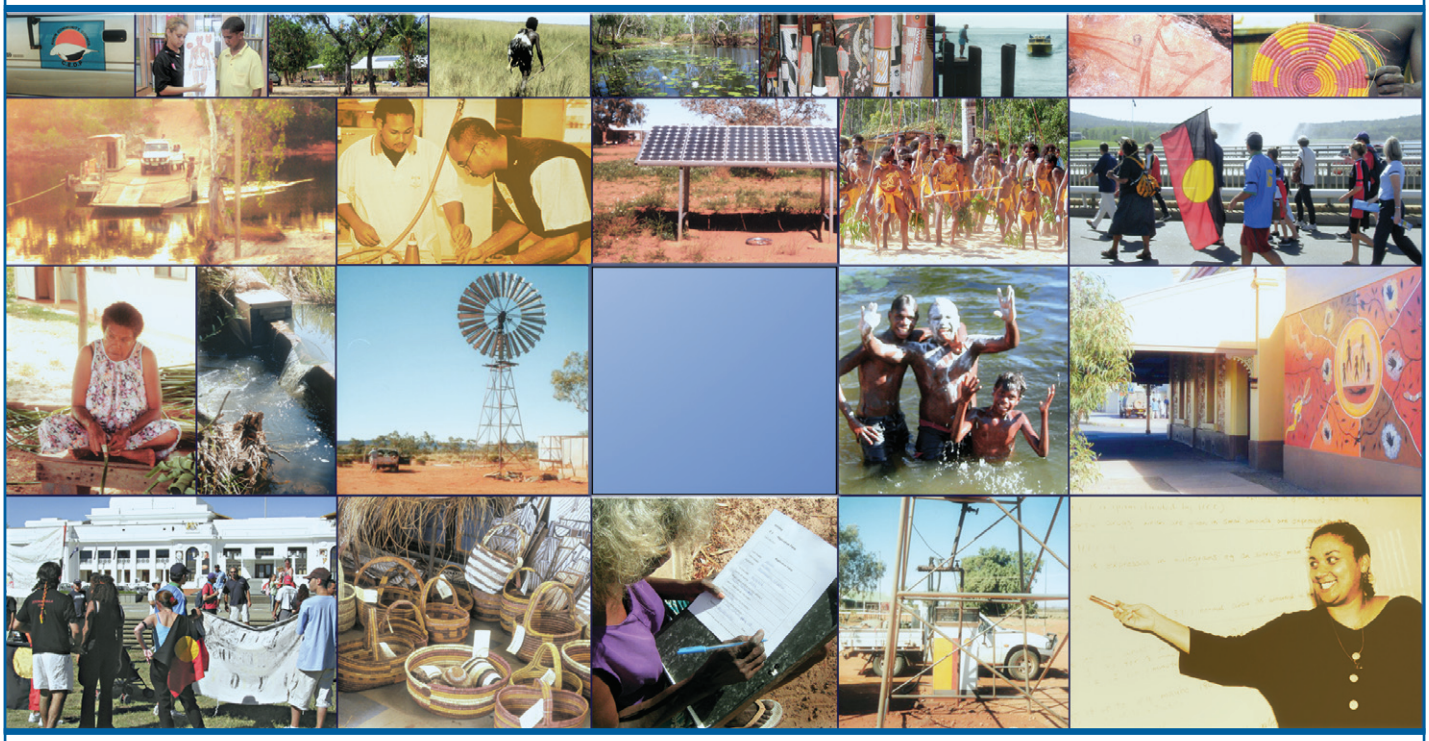

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Ministerial Council for Aboriginal
and Torres Strait Islander Affairs

THE AUSTRALIAN NATIONAL UNIVERSITY

# The geography and demography of Indigenous migration: Insights for policy and planning

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## ABSTRACT

One of the more consistent findings of census-based analysis is that nationally, Indigenous Australians change their place of usual residence more often than the non-Indigenous population. Between 2001 and 2006, 46.5 per cent of the Indigenous population changed their place of usual residence, compared to 43.1 per cent for the non-Indigenous population. Population movement can have significant impacts on the ability of all levels of government to design forward-looking policy at a local level that takes into account the share of the population that identifies as being Indigenous. The aim of this paper is to consider a number of related aspects of Indigenous migration using results from the 2006 Census of Population and Housing. This includes the propensity to move, population redistribution, migration patterns and flows, urbanisation and intra-urban migration.

**Keywords:** Indigenous, migration, census, geographic analysis, labour market outcomes.

## CAEPR INDIGENOUS POPULATION PROJECT

This project has its genesis in a CAEPR report commissioned by the Ministerial Council for Aboriginal and Torres Strait Islander Affairs (MCATSIA) in 2005. The aim of the paper (published as CAEPR Discussion Paper No. 283) was to synthesise findings from a wide variety of regional and community-based demographic studies. What emerged was the identification of demographic 'hot spots'—particular Indigenous population dynamics in particular regions that give rise to issues of public policy concern. These trends spatially align with specific categories of place that transcend State and Territory boundaries. The 'hot spots' coalesce around several structural settings including city suburbs, regional towns, town camps, remote Indigenous towns, and outstations, as opposed to the more formal regionalised or jurisdictional spatial configurations that have tended to guide and inform Indigenous policy development.

Recognising that the structural circumstances facing Indigenous populations are locationally dispersed in this way, MCATSIA has established an enhanced research capacity at CAEPR to further explore the dynamics and regional geography of Indigenous population and socioeconomic change.

This research activity commenced in late 2007 and is constructed around four discrete yet overlapping projects:

- a detailed regional analysis of relative and absolute change in Indigenous social indicators
- an assessment of social and spatial mobility among Indigenous metropolitan populations
- case-study analyses of multiple disadvantage in select city neighbourhoods and regional centres
- the development of conceptual and methodological approaches to the measurement of temporary short-term mobility.

Working Papers related to these projects are co-badged with MCATSIA and released as part of the CAEPR Working Paper Series. It should be noted that the views expressed in these publications are those of the researcher/s and do not necessarily represent the views of MCATSIA as a whole, or the views of individual jurisdictions.

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# EXECUTIVE SUMMARY

1. Population movement can have significant impacts on the ability of all levels of government to design forward-looking and evidence-based policy at a local level that takes into account the share of the population that identifies as being Indigenous. The analysis in this paper uses the 2006 Census of Population and Housing to consider a number of aspects of Indigenous migration.

## PROPENSITY TO MOVE: VARIATION BY DEMOGRAPHY AND GEOGRAPHY

2. In one of the more consistent findings of census-based analysis, it has long been recognised that nationally, Indigenous Australians change their place of usual residence more often than the non-Indigenous population. Between 2001 and 2006, 46.5 per cent of the Indigenous population changed their place of usual residence, compared to 43.1 per cent for the non-Indigenous population. This represents a slight narrowing of the gap from previous census years,

3. Indigenous and non-Indigenous males and females follow a similar pattern of migration over the life cycle. Propensity to move starts off reasonably high, declines steadily throughout compulsory school age, reaches a peak in a person's mid- to late-20s, then gradually declines, with those aged 55 years and over having the lowest propensity of all four groups.

4. The two major differences between the Indigenous and non-Indigenous populations in the propensity to move point to key differences in the cause and effect of long-term migration. The rate of migration for the Indigenous population stays relatively high between the ages of 5–20 years. However, the non-Indigenous population of those in their mid- to late-20s reaches a much higher peak than their Indigenous counterparts.

5. The life cycle patterns of migration for Indigenous and non-Indigenous Australians in major cities and regional areas are very similar. There is, however, a stark difference in remote Australia. Non-Indigenous Australians in remote and very remote Australia are much more likely to migrate compared to their Indigenous counterparts, and it would also appear that employment, education and family formation do not have the same effect on migration for remote Indigenous Australians as they do in non-remote parts of the country.

6. For the Indigenous population, those in large regional towns in 2006 had the highest propensity to move over the previous five years. Those in predominantly Indigenous remote towns, town camps and remote dispersed settlements had the lowest propensity.

## RATES OF MIGRATION AND THE SPATIAL REDISTRIBUTION OF THE INDIGENOUS POPULATION

7. Patterns of Indigenous migration reflect for the most part relatively high or low rates of mobility. There were no location types or jurisdictions that have relatively high (or low) rates of people moving out alongside relatively low (or high) rates of people moving in. There are still discernible patterns in terms of net migration. Compared to city areas there were higher rates of net inward migration for large regional towns and regional rural areas. On the other hand, there were relatively high rates of net outward migration for non-Indigenous remote towns and Indigenous remote towns.

### SPATIAL REDISTRIBUTION OF THE INDIGENOUS POPULATION: PATTERNS AND FLOWS

8. Those Indigenous Australians who changed their Indigenous Area of usual residence between 2001 and 2006 were less likely to move to an area that was relatively far away; were more likely to move to an area that was adjacent; were less likely to move to an area that was in a different State or Territory; and were more likely to move to an area with an already high population. Indigenous Australians are less likely to move to areas where the Indigenous share of the population is higher than where they are moving from, and more likely to move to areas that had more favourable socioeconomic outcomes than their source area.

9. After controlling for distance, contiguity and State/Territory, those who move out of remote areas were generally more likely to move to non-remote areas and vice versa. This highlights the large degree of movement that occurs between remote and non-remote Australia for the Indigenous population. For the non-Indigenous population, on the other hand, migration was more uni-directional, with most people moving to non-remote areas. Even more so than for the Indigenous population, there was very little movement of non-Indigenous Australians from one part of remote Australia to another.

### INDIGENOUS URBAN AND INTRA-URBAN MIGRATION

10. For both Indigenous males and females, the greatest level of net migration to city areas and large regional towns from the rest of Australia occurred amongst the group aged 15–19 years at the end of the period (2006). Alone, this five-year age group made up over 30 per cent of the net Indigenous transfer over the period. Compared to those non-migrants who lived in city areas and large regional towns at both the start and the end of the period, migrants to these areas are more likely to be aged 15–29 years for both sexes. In addition, Indigenous female migrants are more likely to be aged 10–14 years than non-migrants.

11. The relatively young age distribution points to somewhat different social policy priorities for Indigenous migrants to city areas and large regional towns, with a greater focus on the provision of education and training at school and tertiary institutions.

### THE RELATIONSHIP BETWEEN MIGRATION AND EMPLOYMENT

12. At an individual level, Indigenous Australians who move to urban areas do not do as well in the labour market as those who already live there, and may even do worse than those who stay in non-urban areas. At an area level, inward migration from remote dispersed settlements in particular was associated with a significant and substantial decline in the percentage of the population employed in the destination area.

13. These two results highlight the potentially fraught relationship between migration and employment policy. Although governments may have a fiscal motivation to encourage Indigenous Australians to move from non-urban to urban Australia, those who do move may struggle to compete in the private sector labour markets that they find there.

## INTRODUCTION AND OVERVIEW

There is an increasing call for policy development and service delivery that is informed by a solid evidence base. This is particularly required at a local or community level, where it is vital to know the size, composition and socioeconomic needs of the resident population, as well as the population that works, visits or holidays there.

The main source of data for needs-based analysis at the small-area level in Australia is the Census of Population and Housing (henceforth, the census). Counts and estimates from the census are used to distribute electoral boundaries, allocate taxation and other revenues (Commonwealth Grants Commission 2007), and identify socioeconomic advantage and disadvantage (Adhikari 2006). However, the census is essentially a snapshot, with a particular spatial distribution frozen in time. Populations, on the other hand, are dynamic. People move on a temporary basis throughout the day and across the year, and on a more permanent basis from one year to the next. According to the most recent (2006) Census, over 1 million Australians (or 4.7% of the population) were away from their place of usual residence on census night. Furthermore, over 7.5 million Australians (or 43.1% of the population) changed their place of usual residence between the 2001 and 2006 Censuses.

This population mobility and migration has serious implications for policy and planning purposes. Post-census, the size and characteristics of the population might be very different to that which is enumerated, as information from one census becomes out of date long before data from the next census round becomes available. This is recognised by the Australian Bureau of Statistics (ABS), which makes population projections for 50 years into the future (e.g. 2006–56) available two years after each census. However, while these projections are made for different age and sex cohorts, they do not take into account any other demographic, geographic or socioeconomic information.

**ABS**: Australian Bureau of Statistics

In one of the more consistent findings of census-based analysis, it has long been recognised that Indigenous Australians change their place of usual residence more often than the non-Indigenous population (Taylor 2006). In addition, the Indigenous population has been identified as having a high level of socioeconomic need, including by the Prime Minister in his Apology to the Stolen Generations (Rudd 2008).

Between 2001 and 2006, 46.5 per cent of the Indigenous population changed their place of usual residence, compared to 43.1 per cent for the non-Indigenous population. While there is still a difference, it has narrowed substantially from previous census years, with a ratio of 1.08 in the last intercensal period, compared to 1.20 between 1996 and 2001 (Taylor 2006). As the non-Indigenous population's propensity to move stayed reasonably consistent over the period, this convergence is due in large part to a substantial reduction in movement for the Indigenous population (down from 50.8%).

Population movement can have significant impacts on the ability of all levels of government to design forward-looking policy at a local level that takes into account the share of the population that identifies as being Indigenous. However, planning and projections that have done so to date have relied on historical information, usually from the previous intercensal period. But these past rates of migration do not always provide an accurate prediction for the future. For example, the correlation between the net migration rate at the Statistical Local Area (SLA) level between 2001 and 2006, and that which was observed between 1996 and 2001 was only 0.37. To target scarce resources in general, and build the most accurate set of population projections for local areas in particular, it is necessary to have as detailed an understanding as possible of how populations respond to local area characteristics in deciding whether to move and where to move to, as well as how this decision varies across a person's life cycle.

**SLA**: Statistical Local Area

People change their place of usual residence based in part on a comparison of the characteristics of the area in which they live and the characteristics of other potential areas of residence. In the economics literature (Harris & Todaro 1970), this human capital approach assumes that individuals or families make the decision to migrate after comparing the benefits of moving (higher incomes, more pleasant climate/conditions) with the financial and social costs. In the broader migration literature (Greenwood 1997), the modified gravity model has also provided useful insights by highlighting the effect of distance between the source and potential destination areas, and the respective composition of the two populations. However, there are also a range of factors specific to the Indigenous population that either enhance or reduce the motivation to move (Taylor 2006), including ceremonial activities and kin-based obligations.

**COAG:** Council of Australian Governments

Despite the importance of having accurate population projections of the Indigenous population for shaping policy designed to help the Council of Australian Governments (COAG) to meet its Closing the Gap targets, there is very little information available nationally on the geographic and demographic factors that impact on the decision of Indigenous Australians to move, and how they choose their eventual destination. In the only econometric study to date, Biddle and Hunter (2006) used data from the 2001 Census to examine the area-level characteristics associated with migration. This paper updates that study using the latest available data and extends the analysis by using a more flexible set of geographic characteristics.

The analysis in this paper is structured around a number of demographic or geographic aspects of Indigenous migration.

**IARE:** Indigenous Area

- First, the **propensity across a lifetime to change usual residence** over a five-year period is considered, followed by variation across geographic areas. Geographic variation is analysed using a regression approach, with Indigenous Areas (IAREs) as the unit of analysis, and a range of area-level explanatory variables.
- The second aspect of migration analysed is **spatial redistribution of the Indigenous population**. This is done through considering the rates of outward, inward and net migration for different geographic areas, with the analysis showing what parts of the country Indigenous (and non-Indigenous) Australians are moving from, what parts they are moving to, and what the net effect is on the count of the usual resident population.
- In the second set of analyses looking at population redistribution, the pool of migrants is taken as given, and **flows of internal migrants are then analysed**. This includes whether the social or demographic characteristics of potential destination areas relative to the source area are associated with the number of people who move between these areas, as well as whether Indigenous Australians are moving over relatively short or long distances, and whether this average distance varies by geography.
- The next part of the analysis focuses on the **demographic and geographic patterns of urban and intra-urban migration**. That is, the focus is on those Indigenous Australians who move from a non-urban to urban area, as well as those who move within urban areas (especially State/Territory capital cities).
- The final aspect of migration analysed is the extent to which **regional patterns of migration are associated with changes in socioeconomic characteristics of the area**. Already, Biddle (2008) has shown that positive rates of net inward migration were associated with increased rates of overcrowding between 2001 and 2006. In this paper the association with changes in employment outcomes is discussed.

The analysis in this paper is based on the usual residence question from the 2006 Census. Respondents are asked for their place of usual residence on the night of the census, one year previously and five years previously. The first dependent variable used for the analysis in this paper (propensity to move) identifies whether an individual stated a different place of usual residence on census night compared to five years previously.

The remainder of the analysis is based on a cross-tabulation of a person's historic SLA of usual residence compared to their SLA of usual residence on census night. The majority of the analysis focuses on migration between 2001 and 2006. However, some comparisons are also made with those who migrated between 2005 and 2006.

In order to maintain a reasonably consistently sized geography with sufficient Indigenous Australians in each area, these SLAs are collapsed into 531 IAREs.[1] This is the middle geographic level of the Australian Indigenous Geographic Classification (AIGC) constructed by the ABS, with individual geographic units having reasonably consistent population sizes. IAREs are further classified into eight location types based on remoteness, urban size and the geographic composition of the population, following Taylor and Biddle (2008).

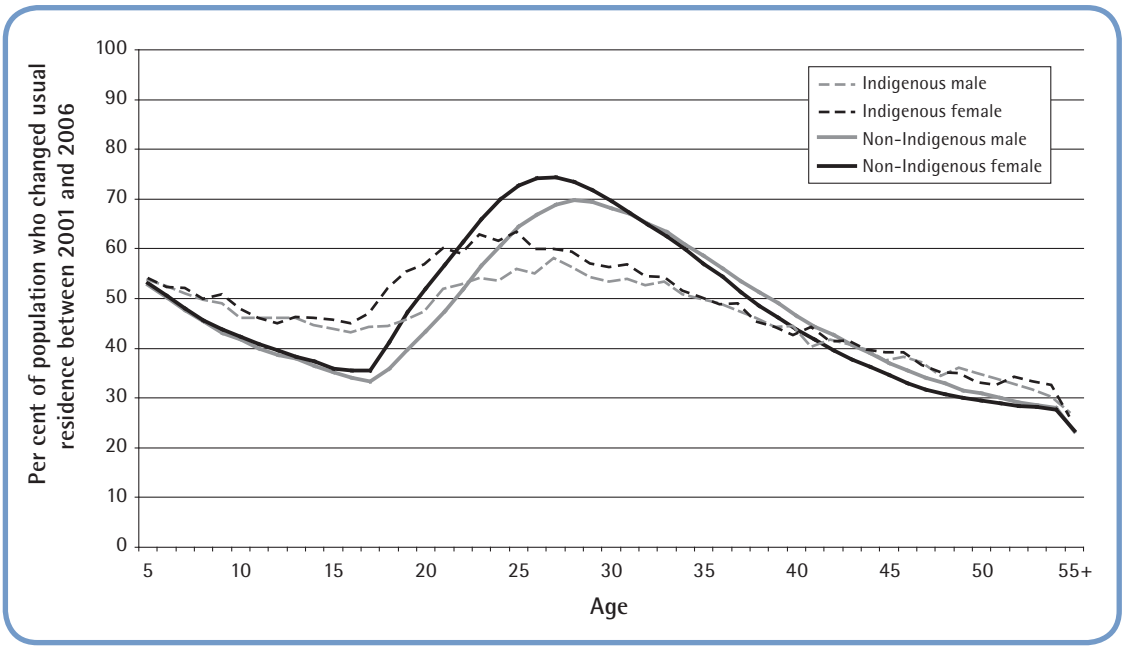
**AIGC:** Australian Indigenous Geographical Classification

## THE DEMOGRAPHY OF INDIGENOUS MIGRATION: VARIATION ACROSS THE LIFE CYCLE

There are a number of events that occur across a person's life that lead to changes in where they live. At a young age, a child's family often moves into a bigger house to accommodate the growing family. Some moves are made in order to be closer to better schooling opportunities, but in general families prefer stability throughout adolescence. However, once schooling is completed, the propensity to change usual residence increases substantially as a youth undertakes post-secondary education or looks for a permanent job. This trend intensifies, as full-time work gives a young adult the means to move out of home, while family formation of their own gives them the motivation. As they settle into a stable job and their children reach school age, migration declines, with home ownership and firm specific human capital adding a substantial cost to be weighed up against the diminishing benefits of moving. Beyond retirement age, labour market characteristics become less important and individuals make decisions on where to live based more on particular amenities in the area or proximity of their extended family.

The above description clearly does not capture the diversity of the migration experience either for Australians in general or for the Indigenous population in particular. However, in aggregate terms it does reflect the research to date, including Biddle and Hunter (2006) and Taylor (2006). These life cycle patterns are summarised in Fig. 1, using the most recent census data via the percentage of Indigenous and non-Indigenous males and females who changed usual residence between 2001 and 2006 by the person's age at the end of the period (with the population aged 55 years and over grouped together).

**Fig. 1. Propensity to change usual residence between 2001 and 2006 across the life cycle: Indigenous and non-Indigenous males and females**



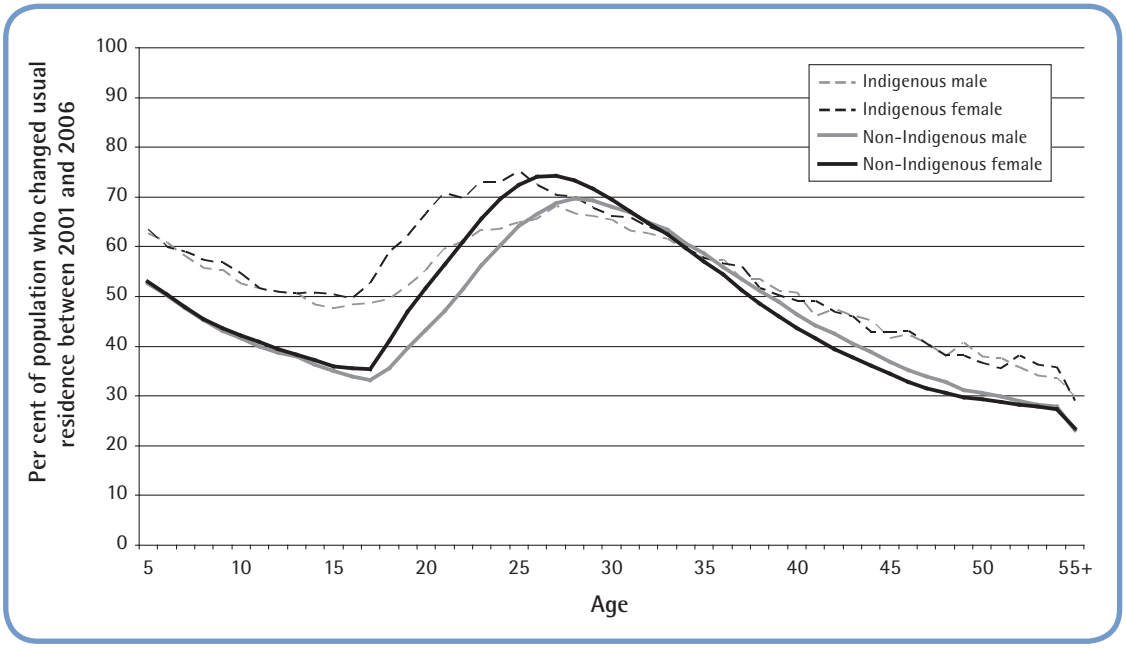

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

In general, all four demographic groups follow a similar pattern of migration across the lifecourse. Propensity to move starts off reasonably high (for the ages 0–5) and then declines steadily throughout compulsory school age. Beyond the age of 15–17, however, the propensity to change usual residence increases substantially, reaching a peak in a person's mid- to late-20s. There is then a gradual decline, with those aged 55 years and over having the lowest propensity of all four groups.

The two major differences between the Indigenous and non-Indigenous plots in Fig. 1 point to key differences in the cause and effect of long-term migration. The rate of migration for the Indigenous population stays relatively high for the ages of 5–20 years. This is likely to both be a reflection of, and potentially be an influence on, a relative lack of engagement with formal education. However, the non-Indigenous population in their mid- to late-20s reach a much higher peak than their Indigenous counterparts. For example, almost three-quarters of non-Indigenous females aged 25–27 years changed their place of usual residence in the five years that preceded the most recent census. Biddle and Hunter (2006) speculate that this is partly due to lower rates of employment-driven mobility for the Indigenous population.

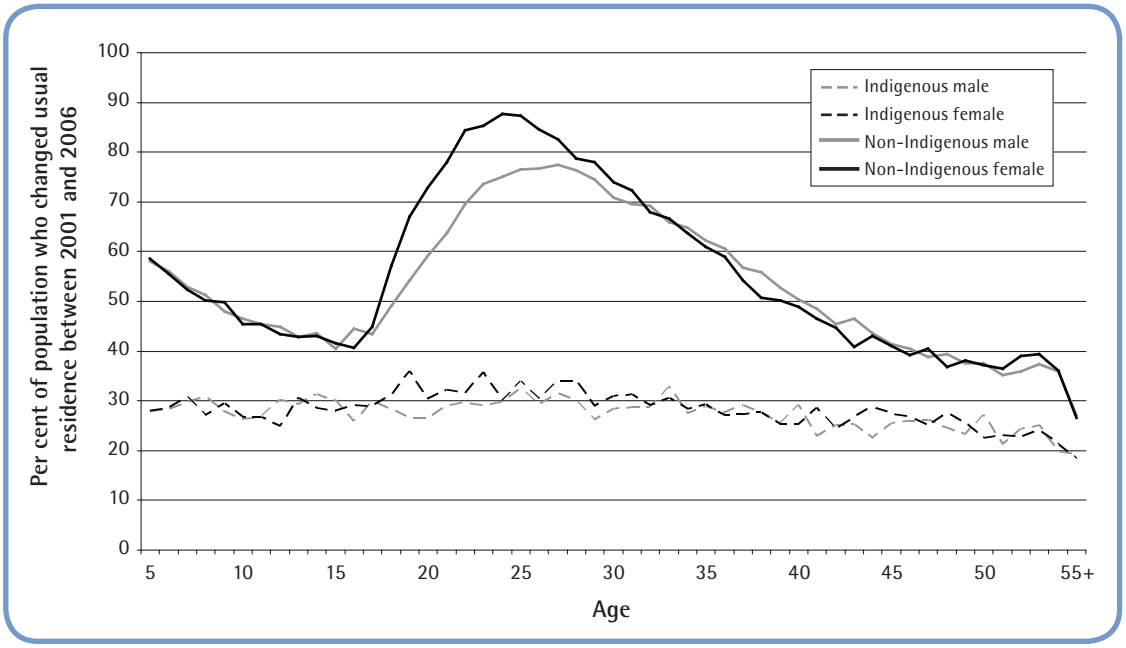
Just as the patterns of migration across the life cycle are obscured by focusing on a single figure each for the Indigenous and non-Indigenous populations, so too is the geographic diversity. This is demonstrated by Figs 2 and 3, which show the propensity to move for the same single-year age groups for those whose usual residence was in a major city or regional Australia in 2006 (Fig. 2), as well as those who lived in remote or very remote Australia (Fig. 3).

**Fig. 2. Propensity to change usual residence between 2001 and 2006 across the life cycle: Indigenous and non-Indigenous males and females living in a major city or regional Australia in 2006**




**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

**Fig. 3. Propensity to change usual residence between 2001 and 2006 across the life cycle: Indigenous and non-Indigenous males and females living in remote or very remote Australia in 2006**




**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

The patterns of migration for Indigenous and non-Indigenous Australians in major cities and regional Australia are very similar. It is important to note that the higher propensity to move amongst school-age Indigenous children remains, however the peak rate in the late 20s is similar for Indigenous and non-Indigenous males as well as Indigenous and non-Indigenous females. The same cannot be said for remote and very remote Australia, as shown in Fig. 3.

The differences in migration patterns between the Indigenous and non-Indigenous population in remote and very remote Australia could not be starker. On the one hand, almost 90 per cent of non-Indigenous females aged 24 and 25 in 2006 changed their place of usual residence in the preceding five years—more than double the propensity to move compared to those aged 10 years younger or 15 years older. Although not as large, there is also a substantial peak for non-Indigenous males around this age. For both Indigenous males and females on the other hand, the percentage stays reasonably constant at around 30 per cent of the population. Clearly, non-Indigenous Australians in remote and very remote Australia are much more likely to migrate than their Indigenous counterparts. It would also appear that employment, education and family formation do not have the same effect on migration for remote Indigenous Australians as they do in non-remote parts of the country.

## PROPENSITY TO MOVE: VARIATION BY GEOGRAPHY

While Figs 2 and 3 demonstrate significant differences across the life cycle in movement propensity between remote and non-remote Australia, it is also important to keep in mind the differences in the levels of migration. That is, 52 per cent of the Indigenous population who lived in non-remote Australia in 2006 had changed usual residence in the previous five years, compared to 28 per cent for those who lived in remote Australia. The relativities are reversed for the non-Indigenous population, with propensities of 40 per cent and 47 per cent respectively.

In this section, the variation in the propensity to move is examined in greater detail by using a regression framework. The percentage of those in each IARE who were at a different usual residence in 2006 compared to 2001 is the dependent variable, and location type as well as State/Territory are the independent variables. A visual analysis of the dependent variable confirmed a distribution that appeared normal and symmetrical about the mean. A linear model is therefore assumed, with coefficients estimated using Ordinary Least Squares.[2]

Compared to those who lived in city areas in 2006, both Indigenous and non-Indigenous Australians in large regional towns were significantly more likely to have changed usual residence in the five years preceding the census. For the Indigenous population, this location type had the highest propensity to move, with the next three location types (small regional towns, regional rural areas and predominantly non-Indigenous remote towns) not having a predicted value that was significantly different from city areas. The final three location types (predominantly Indigenous remote towns, town camps and remote dispersed settlements) all had significantly and substantially lower probabilities than the base case for the Indigenous population, but substantially higher probabilities for the non-Indigenous population (excluding town camps, which were not significant).

An interesting comparison from the model outlined in Table 1 is between predominantly non-Indigenous remote towns (urban centres in remote Australia with a majority non-Indigenous population) and the other three remote location types. For the Indigenous population, the propensity to move in non-Indigenous remote towns is only slightly lower than city areas. The propensity to move in Indigenous remote towns (which have the same degree of urbanisation but a greater Indigenous share) and town camps (which are adjacent to remote towns) is, however, substantially lower. In other words, there is a substantial degree of variation within remote Australia, not just between remote and non-remote parts of the country.

**Table 1. Factors associated with average propensity to move in the area**

| | Indigenous | Non-Indigenous |
|---|---|---|
| Large regional towns | 4.84 | 2.71 |
| Small regional towns and localities | n.s. | n.s. |
| Regional rural areas | n.s. | n.s. |
| Non-Indigenous remote towns | -4.01 | 3.27* |
| Indigenous towns | -39.92 | 19.18 |
| Town camps | -31.46 | n.s. |
| Remote dispersed settlements | -26.34 | 17.44 |
| Victoria | 2.53* | n.s. |
| Queensland | 9.80 | 9.43 |
| South Australia | 5.37 | n.s. |
| Western Australia | 11.38 | 11.74 |
| Tasmania | n.s. | n.s. |
| Northern Territory | 2.42* | 15.69 |
| Australian Capital Territory | n.s. | n.s. |
| Constant | 47.20 | 39.28 |
| Adjusted R-Squared | 0.7709 | 0.5944 |
| Number of areas | 531 | 526 |

**Notes:** The base case is a city area in New South Wales.
n.s. = Variables that are not significant at the 10% level of significance.
* = Variables that are significant at the 10% level of significance, but not the 5% level.

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

The model presented in Table 1 also includes a set of variables to test whether there are any differences in the propensity to move across the eight States and Territories after controlling for location type, with New South Wales set as the base case. Indigenous Australians in five of the remaining seven States and Territories had a significantly higher propensity to move than those in New South Wales. Only in Tasmania and the Australian Capital Territory was the difference not significant, at least at the 10 per cent level of significance. Victoria and the Northern Territory had slightly higher predicted probabilities, however this was only significant at the 10 per cent rather than the 5 per cent level of significance. Western Australia, Queensland, and to a lesser extent South Australia, all had significantly and substantially higher probabilities.

## SPATIAL REDISTRIBUTION OF THE INDIGENOUS POPULATION: RATES OF MIGRATION

The previous section examined the propensity to change usual residence between censuses and how this varied across Australia by geography. This type of analysis is useful for getting an understanding of contemporary patterns of Indigenous long-term mobility, including how these patterns related analogously to non-Indigenous Australians. However, despite there being a relation between the patterns, it only touches on the spatial redistribution of the Indigenous population. That is, it is not clear from the previous analysis whether those who did change their usual residence relocated locally, or changed areas completely. It is the latter type of move that impacts on whether particular areas or types of areas are

**Table 2. Association between location type/jurisdiction and population change from migration between 2001 and 2006**

| | Indigenous | | | Non-Indigenous | | | Change in per cent |
|---|---|---|---|---|---|---|---|
| Explanatory variables | Outward | Inward | Net | Outward | Inward | Net | Indigenous |
| Large regional towns | –4.30 | n.s. | 3.55 | n.s. | n.s. | n.s. | n.s. |
| Small regional towns and localities | –5.67 | –7.52 | –1.85* | n.s. | n.s. | n.s. | n.s. |
| Regional rural areas | –3.49* | n.s. | 4.35 | n.s. | n.s. | n.s. | 3.55* |
| Non-Indigenous remote towns | –8.23 | –16.27 | –8.04 | 11.20 | n.s. | –9.88 | n.s. |
| Indigenous towns | –25.27 | –35.05 | –9.78 | 27.59 | 19.50 | –8.09 | –3.26 |
| Town camps | –13.69 | –19.78 | n.s. | n.s. | n.s. | –16.55* | 8.28* |
| Remote dispersed settlements | –20.12 | –29.12 | –9.00 | 22.34 | 21.09 | n.s. | –5.51 |
| Victoria | n.s. | 4.27 | 4.19 | –3.41 | n.s. | n.s. | n.s. |
| Queensland | 8.81 | 15.27 | 6.46 | 8.15 | 13.59 | 5.45 | 2.26 |
| South Australia | 4.60 | 9.52 | 4.92 | n.s. | n.s. | n.s. | 3.12* |
| Western Australia | 10.15 | 16.48 | 6.33 | 8.66 | 9.21 | n.s. | 4.64 |
| Tasmania | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Northern Territory | 7.47 | 16.18 | 8.70 | 17.99 | 17.97 | n.s. | 7.05 |
| Australian Capital Territory | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Constant | 29.41 | 26.92 | –2.49 | 22.63 | 19.66 | –2.98* | n.s. |
| Adjusted R-Squared | 0.5245 | 0.5482 | 0.2063 | 0.7148 | 0.4535 | 0.0683 | 0.0819 |
| Number of areas | 531 | 531 | 531 | 530 | 530 | 530 | 531 |

**Notes:** The base case is a city area in New South Wales.
n.s. = Variables that are not significant at the 10% level of significance.
* = Variables that are significant at the 10% level of significance, but not the 5% level.

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

growing or declining in terms of their Indigenous population and, depending on the level of movement of the non-Indigenous population, whether the share of the Indigenous population is also changing. This in turn is what impacts on the type and level of services that need to be delivered in a particular area.

This section of the paper focuses on changes in usual residence that cut across IARE boundaries. This is done once again using a regression framework, however in this section there is a separate set of estimates for four dependent variables. The first dependent variable is the rate of outward migration. This is calculated as the number of people whose usual residence was in a given area on census night in 2001 but was in a different area in 2006, expressed as a percentage of the usual resident population in 2001. The second dependent variable is the rate of inward migration, or the number of people who moved into that area between 2001 and 2006, once again expressed as a percentage of the 2001 usual resident population. The third dependent variable is the difference between the two, or the net change in the usual resident population between 2001 and 2006 from migration.

The final dependent variable is the change in the percentage of the population who identified as being Indigenous in each area between 2001 and 2006 that was caused by migration. That is, the person's response to their Indigenous status in 2006 was assumed to be the same as it was in 2001—those who were born between 2001 and 2006 weren't included and neither were those who died over the same period.

Similar to the results presented in Table 1, the base case location type is city areas and the base case state is New South Wales.

Compared to city areas, there was a lower rate of Indigenous outward migration from all location types, with Indigenous remote towns and remote dispersed settlements having the lowest predicted values. For the non-Indigenous population, the highest rates of outward migration were from predominantly non-Indigenous remote towns, predominantly Indigenous remote towns and remote dispersed settlements.

There were three jurisdictions which had areas with a higher rate of outward migration than those in New South Wales for both the Indigenous and non-Indigenous populations. These were Queensland, Western Australia and the Northern Territory. For the Indigenous population, South Australian areas had a higher rate of out-migration than those in New South Wales, whereas Victorian areas had a lower rate of out-migration for the non-Indigenous population.

With a few exceptions, the coefficients for the inward migration estimates were similar (in directional terms at least) to those for outward migration. In addition to having relatively low rates of outward migration, small regional towns and the four remote location types all had lower rates of inward migration for the Indigenous population compared to New South Wales. The jurisdictions also had similar coefficients in both the inward and outward estimations.

There were some differences between the outward and inward migration estimations. The coefficient for regional rural areas was not significant for the inward migration estimates, whereas it was significant for Victoria. These minor differences notwithstanding, a comparison of the first two estimations in Table 2 would suggest that, at least with regards to location type and State/Territory, patterns of Indigenous migration reflect for the most part relatively high or low rates of mobility. In other words, there are no location types or jurisdictions that have relatively high (or low) rates of people moving out alongside relatively low (or high) rates of people moving in.

Despite there being similar coefficients for most of the variables for both the inward and outward rates of Indigenous mobility, there are still discernible patterns in terms of net migration. Compared to city areas, there were higher rates of net inward migration for large regional towns and regional rural areas. On the other hand, there were relatively high rates of net outward migration for non-Indigenous remote towns and Indigenous remote towns, with small regional towns having a coefficient that is negative but not significant at the 5 per cent level of significance. After controlling for location type, there were five states or territories that had a significantly higher rate of net inward migration than New South Wales. The greatest difference was for the Northern Territory. However, Queensland, Western Australia, South Australia and Victoria also had positive coefficients (in that order).

There was very little systematic variation across location type and State/Territory in terms of non-Indigenous net migration (reflected by the low Adjusted R-Squared value). There were higher rates of net outward migration from non-Indigenous remote towns and Indigenous remote towns compared to city areas, as well as higher rates of net inward migration into Queensland than New South Wales. Most of the change in the share of the population who identified as being Indigenous in the IAREs was therefore driven by Indigenous net migration. The variation in this changing Indigenous share is summarised in the last set of results presented in the table.

In interpreting the final column of Table 2, it is important to keep in mind that the population is held constant, so increases in the percentage of the population who identify as Indigenous in one area will be balanced by decreases in another area. The finding that the constant term is not significantly different from zero means that, on average, increases and decreases between 2001 and 2006 in the share of the population who identified as being Indigenous in city areas and those in New South Wales balanced each other out. Compared to city areas, there were two location types—regional rural areas and town camps, which had an increase in the share of the population who identified as being Indigenous (though both were significant at the 10 per cent level of significance only). For Indigenous remote towns and remote dispersed settlements, on the other hand, there was a relative decline in Indigenous share from migration. There were four states that had a significantly higher increase in their Indigenous share between 2001 and 2006 compared to New South Wales. The Northern Territory had the greatest increase, followed by Western Australia, South Australia and Queensland.

## SPATIAL REDISTRIBUTION OF THE INDIGENOUS POPULATION: PATTERNS AND FLOWS

Just as there are important differences in the rates of migration by geography between the Indigenous and non-Indigenous population, there are also differences in where people are moving from and where they are moving to. As will be shown later in this paper, there are potentially very different implications for the effect of migration on destination area outcomes, depending on the type of area from which a person migrated. Furthermore, looking at where people are moving to gives some insight into the motivations for that migration.

The following two figures summarise migration between 2001 and 2006 across four levels of geography: city areas; large regional towns; small regional towns and rural areas; and remote Australia (that is, non-Indigenous remote towns, Indigenous remote towns, town camps and remote dispersed settlements grouped together). Fig. 4 shows the number of Indigenous Australians identified as having moved between these four location type groupings, with Fig.5 repeating the analysis for the non-Indigenous populations. It should be noted that the arrows are scaled within the two populations (larger arrows representing a greater number of migrants) but not between the populations. The raw data that underlies these two figures is available in Tables A1 and A2 of the appendix to this paper.

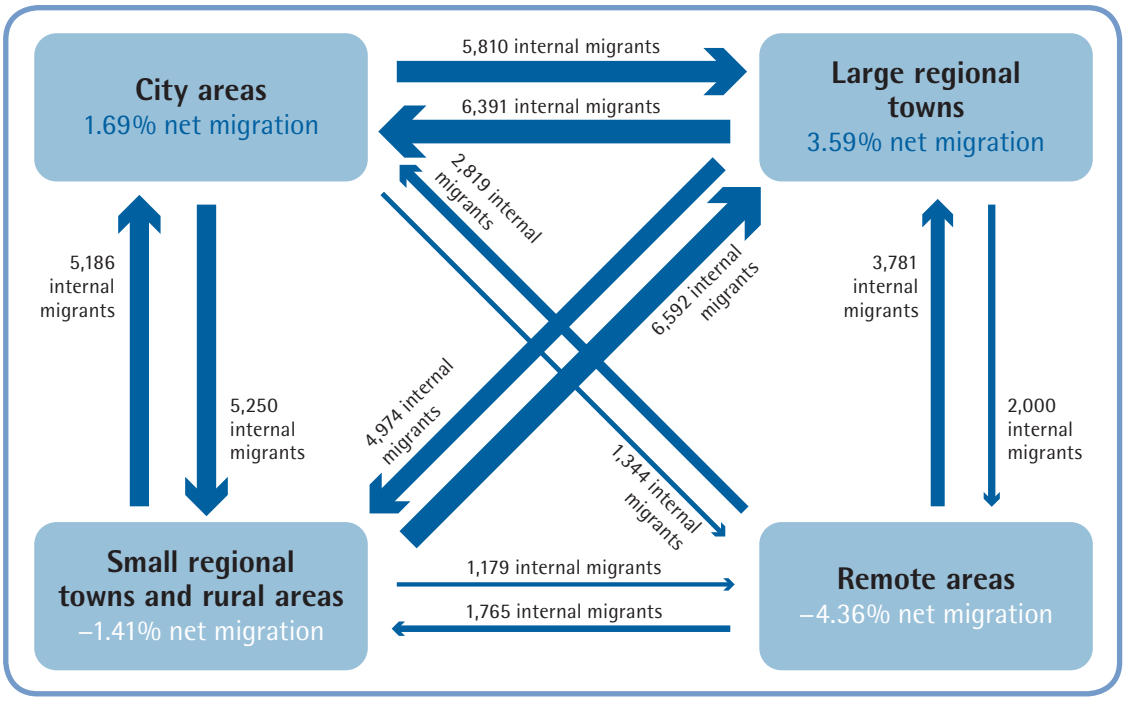
In general, there was net Indigenous migration from less to more urbanised parts of the country. The greatest net transfer (in absolute terms) was from remote areas to either large regional towns or city areas, as well as small regional towns and rural areas to large regional towns. One of the key messages from Fig. 4 is the substantial amount of churn across the broad location type classifications. While in net terms more people moved to city areas and large regional towns than those who left, the number of Indigenous Australians moving to remote areas, small regional towns and regional rural areas was still substantial.

The biggest difference between the non-Indigenous results (in Fig. 5) compared to the Indigenous results (in Fig. 4) was the net outward migration from city areas for the former. Almost 500,000 non-Indigenous Australians were counted as leaving city areas for regional and rural Australia between 2001 and 2006. Much of this migration was made up for by people moving in the opposite direction, with significant international migration keeping growth in city areas positive.

**IREG:**
Indigenous Region

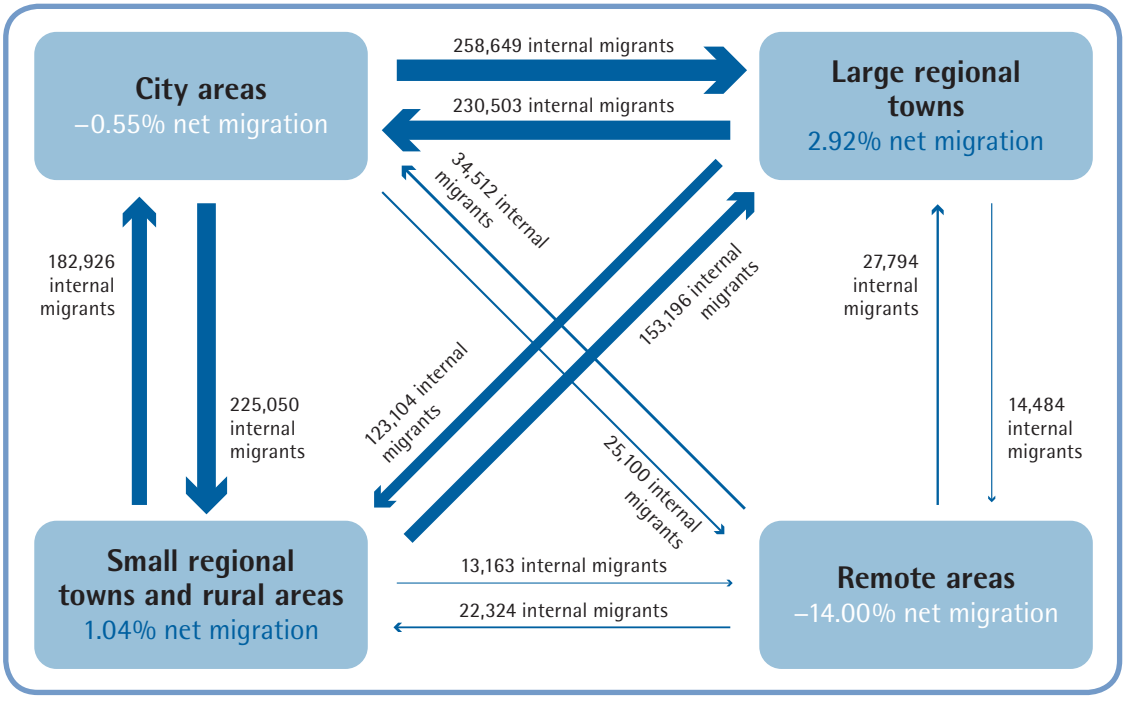
The remainder of this section looks at the patterns of migration at two geographic levels. The first analysis considers the most common source and destination Indigenous Region (IREG) for those who changed IREG between 2001 and 2006. This is the most aggregated level of geography in the AIGC, and as such it gives a useful summary of broad regional patterns of migration. AIGC boundaries and region names can

**Fig. 4. 'Four-corner' migration between location type groupings: Indigenous Australians, 2001–06**




**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

**Fig. 5. 'Four-corner' migration between location type groupings: Non-Indigenous Australians, 2001–06**




**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

**Fig. 6. Indigenous Region (IREG) structure, 2006**


be seen in Fig. 6. The second level of analysis is the now-familiar IARE. Using this more disaggregated level of geography will allow a more detailed look at the factors associated with the destination choice of those who migrated between 2001 and 2006.

## MOST COMMON SOURCE AND DESTINATION INDIGENOUS REGION

The results in this part of the paper are spread across four tables for ease of presentation, with Table 3 looking at the New South Wales and Victoria regions, Table 4 the Queensland and South Australia regions, Table 5 the Western Australia and Tasmania regions and Table 6 the Northern Territory regions and the Australian Capital Territory. This ordering simply reflects the structure of the AIGC and not necessarily the patterns of migration. In each table, those regions that make up over 10 per cent of the outward or inward migrating population for that particular region are given, with the regions presented in order of their contribution.[3] The tables also include the net migration rate for that region to put the results into context.

**Table 3. Most common source and destination regions for New South Wales and Victorian regions, 2001–06**

| | | Indigenous | | Non-Indigenous | |
|---|---|---|---|---|---|
| Indigenous Region | Net migration | Destination | Source | Destination | Source |
| Queanbeyan | –2.11 | Sydney<br>ACT<br>Wagga Wagga<br>Coffs Harbour | Sydney<br>Wagga Wagga<br>ACT | Sydney<br>ACT<br>Coffs Harbour<br>Brisbane | Sydney<br>ACT |
| Bourke | –8.58 | Dubbo<br>Wagga Wagga<br>Tamworth<br>Sydney<br>Coffs Harbour | Dubbo | Coffs Harbour<br>Adelaide<br>Wagga Wagga | |
| Coffs Harbour | 2.06 | Sydney<br>Brisbane<br>Tamworth | Sydney<br>Tamworth<br>Brisbane<br>Wagga Wagga | Brisbane<br>Sydney | Sydney<br>Brisbane |
| Sydney | –4.47 | Coffs Harbour<br>Brisbane | Coffs Harbour | Coffs Harbour<br>Brisbane | Coffs Harbour |
| Tamworth | –2.33 | Coffs Harbour<br>Brisbane<br>Roma<br>Sydney | Coffs Harbour<br>Sydney | Coffs Harbour<br>Brisbane<br>Sydney | Coffs Harbour<br>Sydney |
| Wagga Wagga | –2.44 | Sydney<br>Coffs Harbour<br>Non-Met Victoria | Sydney | Sydney<br>Non-Met Victoria<br>Coffs Harbour | Sydney<br>Non-Met Victoria |
| Dubbo | –2.55 | Coffs Harbour<br>Sydney<br>Wagga Wagga<br>Bourke | Bourke<br>Sydney<br>Wagga Wagga | Coffs Harbour<br>Wagga Wagga<br>Sydney | Sydney<br>Wagga Wagga<br>Coffs Harbour |
| Melbourne | 1.43 | Non-Met Victoria<br>Brisbane | Non-Met Victoria<br>Brisbane | Non-Met Victoria<br>Brisbane | Non-Met Victoria<br>Sydney |
| Non-Metropolitan Victoria | 2.68 | Melbourne<br>Wagga Wagga | Melbourne<br>Wagga Wagga | Melbourne | Melbourne |

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

**Table 4. Most common source and destination regions for Queensland and South Australian regions, 2001–06**

| | | Indigenous | | Non-Indigenous | |
|---|---|---|---|---|---|
| Indigenous Region | Net migration | Destination | Source | Destination | Source |
| Brisbane | 4.96 | Rockhampton<br>Roma<br>Townsville<br>Coffs Harbour | Sydney<br>Rockhampton<br>Coffs Harbour<br>Roma<br>Townsville | Roma<br>Rockhampton<br>Coffs Harbour<br>Melbourne<br>Sydney | Sydney<br>Coffs Harbour<br>Melbourne<br>Roma<br>Rockhampton |
| Cairns | 2.73 | Townsville<br>Brisbane | Torres Strait<br>Townsville<br>Brisbane<br>Cape York | Brisbane<br>Townsville | Brisbane<br>Townsville<br>Sydney |
| Mt Isa | –8.67 | Townsville<br>Cairns | Townsville | Townsville<br>Brisbane<br>Rockhampton | Brisbane<br>Townsville |
| Cape York | –1.01 | Cairns<br>Townsville<br>Brisbane | Cairns<br>Torres Strait<br>Mt Isa | Cairns<br>Townsville<br>Brisbane<br>Rockhampton | Cairns<br>Brisbane<br>Townsville |
| Rockhampton | 2.26 | Brisbane<br>Townsville<br>Roma | Brisbane<br>Townsville<br>Roma | Brisbane<br>Townsville<br>Roma | Brisbane<br>Roma<br>Townsville |
| Roma | –1.09 | Brisbane<br>Rockhampton | Brisbane<br>Rockhampton<br>Tamworth | Brisbane<br>Rockhampton | Brisbane<br>Rockhampton |
| Torres Strait | –11.14 | Cairns<br>Townsville<br>Brisbane | Cairns | Cairns<br>Brisbane<br>Townsville | Brisbane |
| Townsville | 5.02 | Brisbane<br>Cairns<br>Rockhampton | Mt Isa<br>Brisbane<br>Cairns<br>Rockhampton<br>Torres Strait | Brisbane<br>Rockhampton | Brisbane<br>Rockhampton |
| Adelaide | 2.30 | Port Augusta | Port Augusta<br>Darwin<br>Ceduna<br>Non-Met Victoria | Brisbane<br>Melbourne | Port Augusta<br>Melbourne<br>Sydney |
| Ceduna | 0.50 | Adelaide<br>Port Augusta | Adelaide<br>Port Augusta<br>Kalgoorlie | Adelaide<br>Port Augusta | Adelaide<br>Port Augusta |
| Port Augusta | –1.91 | Adelaide<br>Ceduna | Adelaide | Adelaide | Adelaide |

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

**Table 5. Most common source and destination regions for Western Australian regions and Tasmania, 2001–06**

| | | Indigenous | | Non-Indigenous | |
|---|---|---|---|---|---|
| Indigenous Region | Net migration | Destination | Source | Destination | Source |
| Perth | 4.34 | Narrogin<br>Geraldton | Narrogin<br>Geraldton<br>South Hedland<br>Broome<br>Kalgoorlie | Narrogin<br>Melbourne | Narrogin<br>Sydney |
| Broome | –8.28 | Perth<br>Derby<br>Darwin | Perth<br>Derby<br>Kununurra | Perth<br>Narrogin | Perth<br>Narrogin |
| Kununurra | –4.69 | Derby<br>Perth<br>Katherine<br>Broome | Derby<br>Broome | Perth<br>Narrogin | Perth<br>Narrogin |
| Narrogin | –1.59 | Perth | Perth | Perth | Perth |
| South Hedland | 1.13 | Perth<br>Geraldton<br>Narrogin | Geraldton<br>Perth<br>Narrogin<br>Kalgoorlie | Perth<br>Narrogin | Perth<br>Narrogin |
| Derby | –5.64 | Kununurra<br>Perth<br>Broome | Kununurra<br>Broome | Perth<br>Narrogin | Perth<br>Narrogin |
| Kalgoorlie | –2.63 | Perth<br>South Hedland<br>Narrogin | Perth<br>Geraldton | Perth<br>Narrogin | Perth<br>Narrogin |
| Geraldton | –2.64 | Perth<br>South Hedland<br>Narrogin | Perth<br>South Hedland | Perth<br>Narrogin | Perth<br>Narrogin |
| Tasmania | –0.64 | Brisbane<br>Melbourne | Brisbane<br>Sydney | Melbourne<br>Brisbane | Melbourne<br>Sydney<br>Brisbane |

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

For the Indigenous population who were in a New South Wales IREG in 2001, Sydney and Coffs Harbour appear to be common destination regions for those who do migrate. Despite being in a different state, Brisbane is also a common destination for New South Wales Indigenous migrants, with a large proportion of those who migrate out of Melbourne also choosing to move there. Sydney is also a common source region with the Indigenous population moving from there in relatively large numbers to Queanbeyan, Coffs Harbour, Tamworth, Wagga Wagga and Dubbo. There are few differences in the main destination and source regions between the Indigenous and non-Indigenous population who move into or out of New South Wales and Victoria IREGs.

**Table 6. Most common source and destination regions for Northern Territory regions and the Australian Capital Territory, 2001–06**

| | | Indigenous | | Non-Indigenous | |
|---|---|---|---|---|---|
| Indigenous Region | Net migration | Destination | Source | Destination | Source |
| Alice Springs | 9.44 | Darwin<br>Adelaide | Apatula<br>Adelaide<br>Darwin | Adelaide<br>Darwin | Adelaide |
| Jabiru | –2.47 | Darwin | Darwin | Darwin | Darwin |
| Katherine | –1.68 | Darwin | Darwin<br>Kununurra | Darwin<br>Brisbane<br>Coffs Harbour | |
| Apatula | –4.70 | Alice Springs | | Alice Springs<br>Adelaide<br>Brisbane | Adelaide |
| Nhulunbuy | –0.96 | Darwin | Darwin<br>Katherine | Brisbane<br>Darwin<br>Rockhampton | Darwin |
| Tennant Creek | –7.66 | Mt Isa<br>Darwin<br>Alice Springs<br>Katherine | | Darwin<br>Alice Springs | |
| Darwin | 5.56 | Brisbane<br>Adelaide | Jabiru<br>Katherine | Brisbane<br>Adelaide | Adelaide<br>Brisbane |
| ACT | 2.32 | Queanbeyan<br>Brisbane<br>Sydney | Queanbeyan<br>Sydney<br>Brisbane<br>Wagga Wagga | Queanbeyan<br>Brisbane<br>Sydney<br>Melbourne | Sydney<br>Queanbeyan |

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

Migration out of Queensland IREGs appears to be generally in a southerly direction. Those who moved out of Torres Strait and Cape York moved to Cairns. Those who moved out of Cairns and Mount Isa moved to Townsville. Finally, those who have moved out of Rockhampton, Roma and Townsville moved to Brisbane. Furthermore, apart from those who moved out of Brisbane, most of the internal migration of the Indigenous population was to other regions within Queensland.

Looking at the results for South Australia, an interesting finding for the Indigenous population is that of those who moved into Adelaide, a large proportion came all the way from Darwin. Once again, there were not many differences between the Indigenous and non-Indigenous populations in terms of their source and destination regions.

The most obvious finding from Table 5 is that for the vast majority of regions in Western Australia, Perth and Narrogin (in that order) were the most common sources and destinations for non-Indigenous migrants. For Perth, most of these moved to or from Narrogin, with a smaller percentage (though still greater than 10%) moving to Melbourne or from Sydney.

As for Indigenous migrants, Perth, and to a lesser extent Narrogin, were also common destination and source regions for the Indigenous internal migrants. However, there were also a large number of moves into and out of other Western Australian Indigenous Regions. For example, Derby was the most common destination and source region for internal migrants out of and into Kununurra, with the reverse also being true. Interestingly, for the Indigenous population there were also two common destinations across the Western Australian border. Of the Indigenous population who moved out of Broome, more than 10 per cent went to Darwin, and of those who moved out of Kununurra, more than 10 per cent went to neighbouring Katherine.

Reflecting the large net Indigenous migration rates for Darwin and Alice Springs, it is not surprising that they are the most common destinations for the remaining regions in the Northern Territory. However, there are also a few common moves that go across the State border. In addition to Darwin, a common destination area for those who moved out of Alice Springs is Adelaide. Those that move out of Darwin are likely to move even further still, with Brisbane and Adelaide being the two most common destinations.

## FACTORS ASSOCIATED WITH DESTINATION IARE

The results presented in Tables 3–6 show in general that Indigenous Australians moved to an area that was in the same State or Territory, with capital city regions being amongst the more common destination regions. Because of the large geographic size of most Indigenous Regions, however, all but the most substantial changes in usual residence were excluded from that particular analysis. Furthermore, as there were only 37 IREGs in 2006, there was substantial variation in migration patterns within the regions that were missed. This section takes a more detailed look at the patterns of Indigenous and non-Indigenous migration by examining the factors associated with the eventual destination area for those who changed their IARE of usual residence between 2001 and 2006.

Using a regression style of analysis once again and focusing on those who moved out of an IARE, the dependent variable for the remainder of the analysis in this section is the proportion of those people who moved into one of the other 531 IAREs. This is calculated for each of the IAREs, resulting in a sample size of 281,430 pairs of IAREs (531 x 530) for the Indigenous population, and 271,962 pairs (522 x 521) for the non-Indigenous population. The latter has a slightly lower sample size as some migration pairs were excluded due to low non-Indigenous populations in the source area. A separate estimate is also carried out for those who moved out of areas in non-remote Australia (195,570 pairs for the Indigenous population and 192,096 for the non-Indigenous population) as well as those who moved out of areas in remote Australia (85,560 and 79,866 pairs respectively).

The explanatory variables are consistent across all models, with the first three capturing the spatial relationship between the source and the destination areas through distance, whether they are contiguous and whether they are in a different State or not. The fourth variable captures the population size of the destination area expressed as a percentage of the total Indigenous or non-Indigenous Australian population.

The next set of variables captures the difference in characteristics between the source and destination areas in 2001, including the difference in the Indigenous population share and the difference in socioeconomic outcomes in 2001 as measured using the summary indicator introduced in Biddle (2009). For the Indigenous estimates, this latter variable is based on socioeconomic outcomes of the Indigenous population, whereas for the non-Indigenous estimates it is based on non-Indigenous socioeconomic outcomes. A positive difference for these variables means that the destination area had a greater Indigenous share of the population and more favourable socioeconomic outcomes than the source area.

**Table 7. Factors associated with the eventual destination area for those who changed IARE of usual residence between 2001 and 2006**

| | Indigenous | | | Non-Indigenous | | |
|---|---|---|---|---|---|---|
| Explanatory variables | Australia | Non-remote | Remote | Australia | Non-remote | Remote |
| Distance between source and destination areas | –0.1891 | –0.1947 | –0.4528 | –0.1966 | –0.1981 | –0.2996 |
| Areas are contiguous | 3.7643 | 4.3034 | 3.2299 | 4.0797 | 4.6384 | 1.6522 |
| Areas are in a different State/Territory | –0.0540 | –0.0208 | –0.0619 | –0.0792 | n.s. | –0.2484 |
| Percentage of Australian population in destination area | 0.7284 | 0.7272 | 0.7240 | 0.6086 | 0.5719 | 0.7106 |
| Difference between source and destination Indigenous per cent | –0.0011 | –0.0007 | –0.0013 | –0.0017 | –0.0016 | –0.0012 |
| Difference between source and destination socioeconomic rank | 0.0006 | 0.0005 | 0.0008 | 0.0004 | 0.0005 | n.s. |
| Level of migration in opposite direction | 0.3975 | 0.2843 | 0.5066 | 0.2203 | 0.2687 | 0.1691 |
| Large regional towns | 0.0522 | 0.0459 | 0.0311 | –0.0363 | –0.0539 | n.s. |
| Small regional towns and localities | –0.0221 | –0.0531 | n.s. | –0.0998 | –0.1432 | n.s. |
| Regional rural areas | –0.0335 | –0.0818 | 0.0517 | –0.0967 | –0.1463 | n.s. |
| Non-Indigenous remote towns | 0.0548 | –0.0531 | 0.1943 | –0.1290 | –0.1771 | n.s. |
| Indigenous remote towns | 0.0663 | 0.0398 | –0.1040 | –0.0847 | n.s. | –0.2638 |
| Town camps | 0.1030 | 0.1268 | –0.2037 | n.s. | 0.0887 | –0.2465 |
| Remote dispersed settlements | 0.0394 | 0.0269 | –0.1446 | –0.1278 | –0.0504 | –0.2506 |
| Victoria | 0.0790 | 0.0894 | 0.0499 | 0.1332 | 0.1305 | 0.1045 |
| Queensland | 0.1307 | 0.1610 | n.s. | 0.1964 | 0.2052 | 0.1002 |
| South Australia | 0.1213 | 0.1514 | n.s. | 0.1650 | 0.1655 | 0.1057 |
| Western Australia | 0.2543 | 0.2910 | 0.1076 | 0.2917 | 0.3013 | 0.1840 |
| Tasmania | 0.0999 | 0.1449 | 0.0580 | 0.1432 | 0.1651 | 0.0633 |
| Northern Territory | 0.2055 | 0.2077 | n.s. | 0.2192 | 0.2101 | 0.0911 |
| Australian Capital Territory | 0.0832 | 0.1214 | n.s. | 0.1613 | 0.2053 | n.s. |
| Constant | 1.1228 | 1.1445 | 3.0675 | 1.2970 | 1.2220 | 2.2432 |
| Adjusted R-Squared | 0.3446 | 0.3721 | 0.3502 | 0.3138 | 0.4629 | 0.1175 |
| Number of area pairs | 281,430 | 195,570 | 85,860 | 271,962 | 192,096 | 79,866 |

**Notes:** The base case is a city area in New South Wales.
n.s. = Variables that are not significant at the 10% level of significance.

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

The next variable is the share of the Indigenous population who moved out of the destination IARE that migrated to the source area. That is, the level of migration in the opposite direction. The final two sets of variables capture the location type classification and State/Territory of the destination area, with city areas and areas in New South Wales once again representing the base case. Parameters are once again estimated using OLS.[4]

Focusing on the first set of variables, the sign and significance are consistent across all three groups of areas (Australia as a whole and by remoteness) for Indigenous Australians, and for all but one variable for non-Indigenous Australians. Leaving aside the difference in magnitude, the results show that those Indigenous Australians who moved from an IARE between 2001 and 2006 were less likely to move to an area that was relatively far away, were more likely to move to an area that was adjacent, were less likely to move to an area that was in a different State or Territory and were more likely to move to an area with an already high population with the same Indigenous status. All four results are what one would expect from the modified gravity model discussed earlier.

Similar results were found for the non-Indigenous population, with the only exception being the variable indicating whether the source and destination areas were in the same State or Territory. This was not found to be significant for those who moved out of non-remote areas. In other words, once the other characteristics of the model had been controlled for (like distance and contiguity) non-Indigenous Australians who moved out of non-remote areas do not seem to have a preference for their original State or Territory in choosing a destination area.

There was also a fair degree of consistency in the variables used to capture differences in Indigenous share and socioeconomic outcomes. The results show that both Indigenous and non-Indigenous Australians are less likely to move to areas where the Indigenous share of the population is higher than where they are moving from. Furthermore, with the exception of those non-Indigenous Australians who moved from remote areas, both populations were more likely to move to areas that had more favourable socioeconomic outcomes than their source area. Looking at these results together highlights the benefit of following both a human capital and modified gravity approach to migration analysis, with Indigenous and non-Indigenous Australians appearing to take into account both demographic and socioeconomic characteristics of areas when making a decision about eventual destination areas.

The seventh variable in the estimations shows that a higher proportion of the population migrates to areas where there is also a high rate of migration in the opposite direction. The size of the association is greatest for Indigenous Australians who moved from a remote area, showing that for that population in particular, there are pairs of IAREs that have high rates of back and forth migration. It is worth keeping in mind that these results hold even after controlling for the distance between the source and destination areas, whether or not they are contiguous and whether or not they are in a different jurisdiction, showing that these migration flows transcend spatial relationships and may have more to do with historical and social ties.

While there was general consistency between the results for the first three sets of variables, this was not the case for the location-type variables. Not only were there differences between the Indigenous and non-Indigenous populations, there were also differences depending on whether the person was moving from a remote or a non-remote area. For the Indigenous population across all IAREs in Australia, those who changed their area of usual residence were more likely to move to large regional towns, non-Indigenous remote towns, Indigenous remote towns, town camps and remote dispersed settlements (compared to the base case, city areas), but less likely to move to small regional towns or rural areas.

Comparing the non-remote and remote estimates, there was only one location type that had the same sign coefficient. Those Indigenous Australians who moved out of a non-remote area and those who moved out of a remote area were both more likely to move to a larger regional town as opposed to city areas. The coefficient for small regional towns was not significant for the remote estimates. However, the remaining five location types all had different signs across the two models.

Remote Indigenous towns, town camps and remote dispersed settlements were more common destination areas than city areas for those who moved out of a non-remote area, but less common destination areas for those who moved out of a remote area. The reverse was true for regional rural areas and non-Indigenous remote towns, which were a common destination for remote, but not non-remote, migrants.

What these comparisons of location type show is that after controlling for distance, contiguity and State/Territory, those who move out of remote areas were generally more likely to move to non-remote areas and vice versa. This is an important finding and highlights the large degree of movement that occurs between remote and non-remote Australia for the Indigenous population. For the non-Indigenous population, on the other hand, migration was more uni-directional with most people moving to urban areas. Even more so than for the Indigenous population, there was very little movement of non-Indigenous Australians from one part of remote Australia to another.

## INDIGENOUS URBAN AND INTRA-URBAN MIGRATION

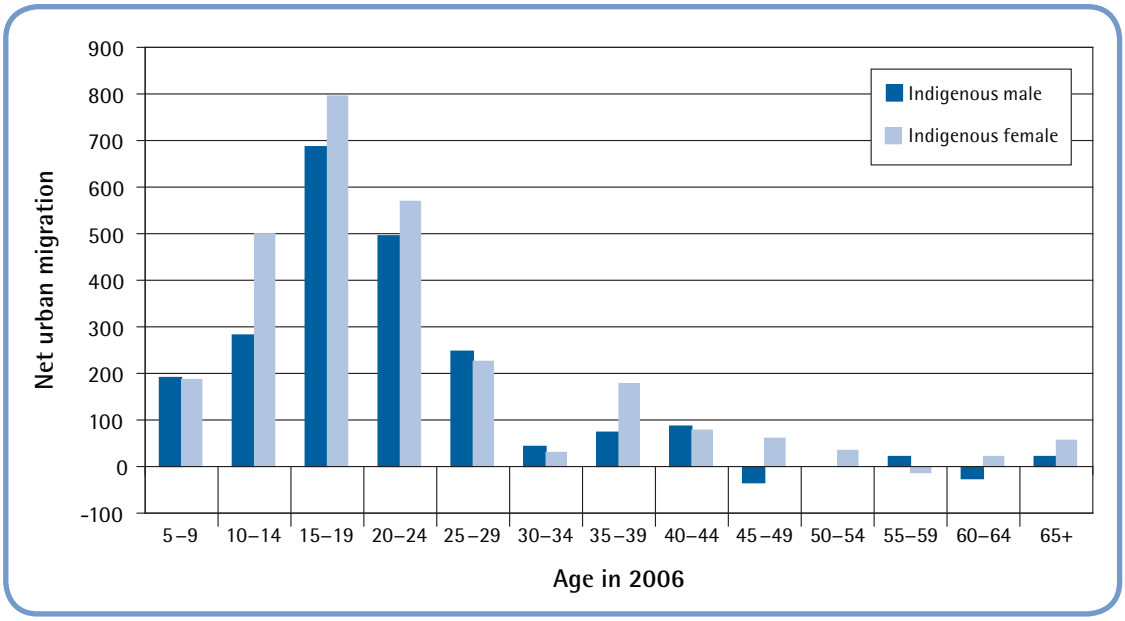
One of the key findings from Table 2 presented earlier was that, apart from regional rural areas (of which there were only 22 in 2006, representing 2.5% of the total Indigenous population), the two location types with the highest net inward migration were major cities and large regional towns. In other words, between 2001 and 2006 there was a net movement from remote or semi-urban areas to major urban areas. Taken together, there were 18,378 Indigenous Australians who were identified as moving to city areas and large regional towns between 2001 and 2006 from the rest of Australia. This was significantly balanced by the 13,568 Indigenous Australians moving in the opposite direction, nonetheless resulting in a net transfer of 4,810 Indigenous Australians.

While the size of the net transfer between remote, rural or semi-urban Australia to city areas and large regional towns is reasonably small compared to the size of the applicable Indigenous population (353,406), it is perhaps more instructive to compare it against the net transfer of non-Indigenous Australians (10,689 people). That is, although Indigenous Australians made up only 2.2 per cent of the applicable population in 2006, they made up 31 per cent of the net transfer between the two sets of location types between 2001 and 2006.

### THE DEMOGRAPHY OF INDIGENOUS URBANISATION

The analysis in the previous section showed that the Indigenous population often moved between city areas and large regional towns, and from non-remote to remote Australia. However, there still remains a net transfer from small regional towns and remote Australia to more urbanised parts of the country. The reasons for migrating to cities or large regional towns are varied, including family, employment, and education. Whatever the motivation for the individual (and these will be analysed in a future release), there are likely to be distinct demographic patterns to this net migration.

**Fig. 7. Age distribution of net inward migration to city areas and large regional towns: Indigenous males and females, 2001–06**



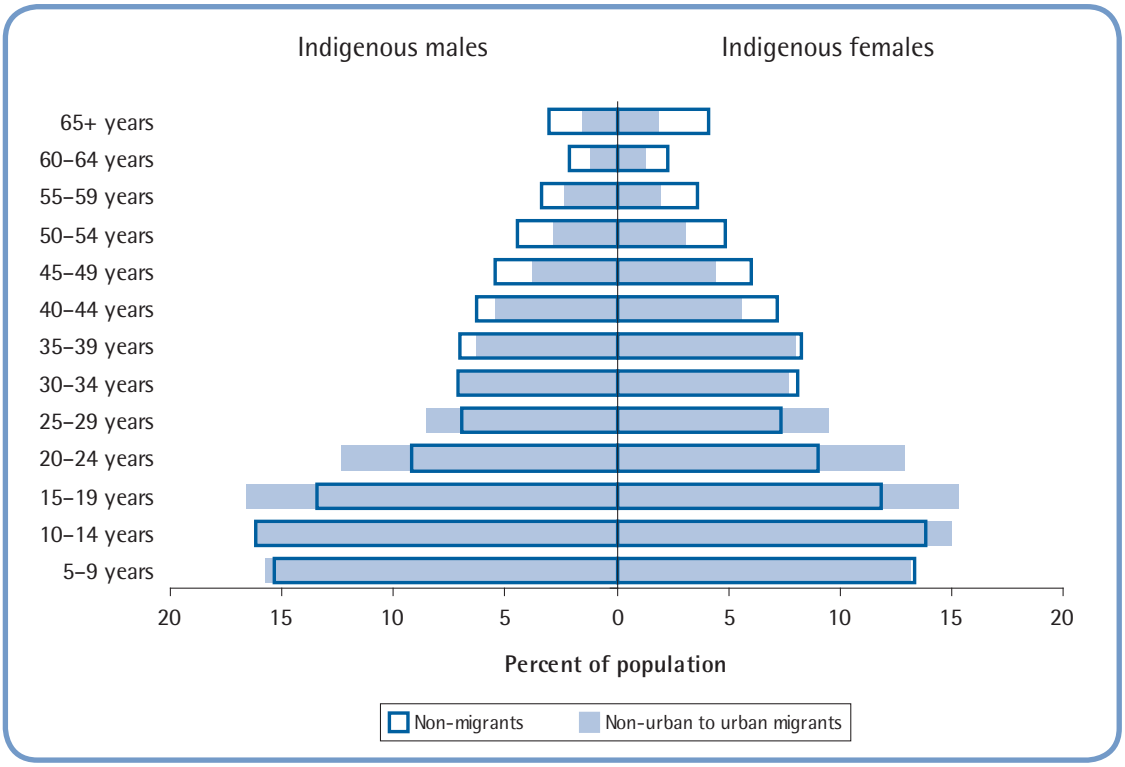

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

Focusing on those Indigenous Australians who moved between city areas and large regional towns (labelled urban Australia in the figures) and small regional towns, rural areas and the four remote location types (labelled non-urban Australia in the figures),[5] Fig. 7 graphs the net transfer between 2001 and 2006 by a person's age at the end of the period. Indigenous males and females are presented separately, with positive values signifying a greater number of people moving to city areas and large regional towns than leaving.

For both males and females, the greatest level of net migration to city areas and large regional towns occurred amongst the group aged 15–19 years at the end of the period, 2006. Alone, this five-year age group made up over 30 per cent of the net Indigenous transfer over the period. Much of this movement (and that of the two age groups on either side) would have been to undertake formal education, whether at the secondary or post-secondary level. There was some net transfer back to the rest of Australia amongst certain older age groups (45–49 years and 60–64 years for males, and 55–59 years for females). However, beyond the age of 45 years there was general stability in terms of net flows of the Indigenous population between the two location type groups.

Focusing on the 15 years of the life cycle with both the highest rates of net migration to city areas and large regional towns and the highest rates of education participation (those aged 10–24 years at the end of the period), around 56 per cent of the net transfer was female. This is despite females making up only 49 per cent of the relevant age group. It is unclear from the available data whether this is a cause or an affect. However, it is most likely related in some way to the higher rates of education participation amongst Indigenous females relative to Indigenous males documented elsewhere (for example Yap & Biddle 2009).

**Fig. 8. Age distribution of migrants and non-migrants to city areas and large regional towns: Indigenous males and females, 2006**



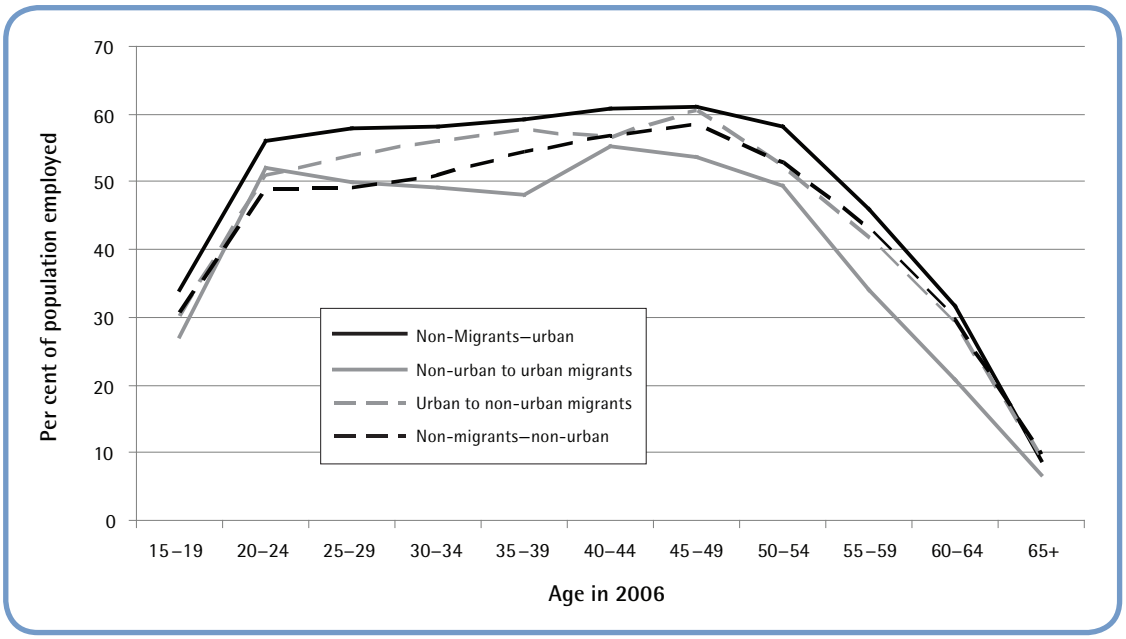

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

The relative concentration of youth amongst those who move to city areas and large regional towns is further highlighted by a comparison with those who lived there throughout the period (non-migrants). This is demonstrated in Fig. 8, in which a standard age pyramid expresses by sex the percentage of inward migrants that are in each of the applicable five-year age groups, alongside the respective percentage for non-migrants.

The results presented in Fig. 8 reinforce the youthful age profile of migrants to city areas and large regional towns. Compared to those non-migrants who lived in urban Australia at both the start and the end of the period, migrants to urban areas are more likely to be aged 15–29 years for both sexes. In addition, Indigenous female migrants are more likely to be aged 10–14 years than non-migrants.

The relatively young age distribution points to somewhat different social policy priorities for Indigenous migrants to city areas and large regional towns, with a greater focus on the provision of education and training at school and tertiary institutions. The relationship between education and Indigenous migration and mobility will be covered in future research. However, there is also likely to be a greater focus on the provision of employment services. On the one hand, one of the motivations to move is improved access to labour markets. On the other hand, there is likely to be an adjustment period, with those who have moved lacking the regional-, local- or firm-specific human capital that is valued in the labour market, as well as the social and job networks that are crucial in obtaining employment. This poor relative employment performance of migrants to city areas and large regional towns is demonstrated in Fig. 9.

**Fig. 9. Percentage of population employed by age: Indigenous urban and non-urban migrants and non-migrants, 2001–06**



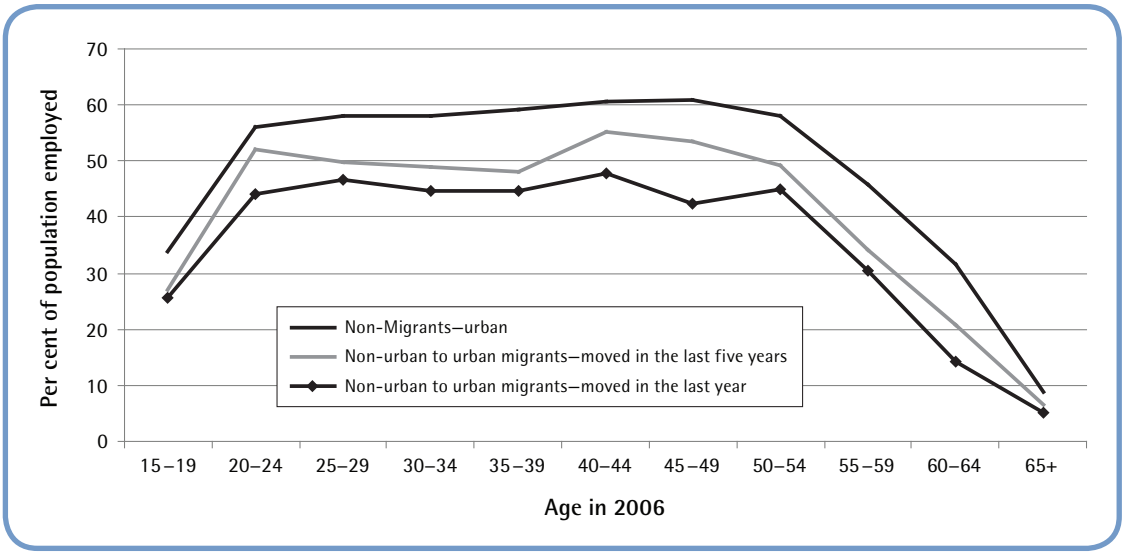

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

Fig. 9 shows the percentage of four Indigenous migration groupings who were employed, broken down by their age at the end of the period. The two unbroken lines represent the employment percentages for those in city areas and large regional towns at the end of the period (when employment is measured). The darker line is for those who were there at both the start and the end of the period (non-migrants), whereas the grey line is for those who moved from the rest of Australia over the period (migrants). Comparing these two lines, it is clear that there is a large gap in the employment percentages between non-migrants and migrants. The gap is greatest amongst those of prime working age (around 35–39 years at the end of the period), with 59.2 per cent of non-migrants in that group employed compared to 48.0 per cent of migrants. However, there is a gap of at least four percentage points for all age groups, apart from those 65 years and over.

Fig. 9 therefore provides prima facie evidence that those who move to city areas and large regional towns do not do as well in the labour market as those who live in such areas at the beginning of the period. However, because other human capital characteristics have not been controlled for in the results presented in Fig. 9, it is not clear whether other differences between the populations explain much of this gap. It has been shown in a number of studies that employment outcomes are worse and education participation lower in remote areas (most recently by Biddle 2009), so it is likely that migrants to urban areas have lower levels of education and labour market experience than non-migrants.

Given this potential sample bias, comparisons between those who left the rest of Australia and those who stayed there (the broken black line) are also instructive. The two lines stay somewhat close to one another up until those aged 35–39 years. Beyond this there is a reasonably consistent divergence, with those who did not move to city areas and large regional towns having higher rates of employment. It may be that those who did not migrate chose not to do so because they had better employment prospects

**Fig. 10. Percentage of population employed by age: Indigenous urban and non-urban migrants and non-migrants, 2001–06**




**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

**CDEP:** Community Development Employment Projects

relative to those who left. It is likely that employment in the Community Development Employment Projects (CDEP) Program (which was still quite prominent in remote Australia in 2006) bolstered the labour market prospects of those who remained in remote Australia in particular. Nonetheless, whatever the sample selection issues and causal pathways, Fig. 9 shows that from a person's mid-thirties onwards, those Indigenous Australians who moved to city areas and large regional towns between 2001 and 2006 had the worst employment percentages of all four migrant groups.

One piece of evidence that points to labour market adjustment explaining at least some of this relatively poor employment performance is a comparison between those who moved between 2001 and 2006 and those who moved over a shorter time period (2005–2006).[6] The employment-to-population percentage of this group is given in a separate line in Fig. 10, alongside those who were in city areas and large regional towns at the beginning of the period, as well as those who moved there between 2001 and 2006.

While the difference is relatively small in the two extreme age groups (15–19 years and 65 years and over), in general those who had only lived in city areas and large regional towns for a maximum of one year had worse employment outcomes than those who had been there for a maximum of five years (not to mention those who had been there at the start of the period). Once again, there is a sample selection issue that makes definitive statements difficult, in that those who moved to city areas and large regional towns from 2001 who struggled in obtaining employment may have moved back to their original location before 2006. Nonetheless, the results presented in Fig. 10 show that recent migrants have substantially worse outcomes than those who have lived there for more than a year.

**Table 8. Intra-urban and outward migration: State/Territory capital cities, 2001–06**

| City | Indigenous | | | Non-Indigenous | | |
|---|---|---|---|---|---|---|
| | Intra-urban | Outward | Ratio: Intra-urban to total | Intra-urban | Outward | Ratio: Intra-urban to total |
| Sydney | 33.9 | 12.6 | 0.73 | 30.2 | 7.3 | 0.81 |
| Melbourne | 33.5 | 12.0 | 0.74 | 29.7 | 5.4 | 0.85 |
| Brisbane | 44.2 | 12.1 | 0.79 | 37.9 | 7.4 | 0.84 |
| Adelaide | 36.8 | 11.5 | 0.76 | 29.5 | 5.9 | 0.83 |
| Perth | 40.7 | 13.6 | 0.75 | 34.9 | 7.4 | 0.82 |
| Hobart | 33.8 | 11.0 | 0.75 | 27.8 | 10.2 | 0.73 |
| Darwin | 31.1 | 17.0 | 0.65 | 24.9 | 28.7 | 0.46 |
| Canberra | 28.4 | 21.8 | 0.56 | 25.1 | 15.6 | 0.62 |

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

## THE DEMOGRAPHY AND GEOGRAPHY OF INTRA-URBAN MIGRATION

While there was net movement from the rest of Australia to city areas and large regional towns over the last intercensal period with distinct demographic patterns, the level of movement within urban Australia is greater still. It has already been shown in Fig. 5 that there was almost as much movement between large regional towns and city areas as there was from the rest of Australia. However, this does not capture the large amount of movement that occurred within particular cities or towns. Looking only at the eight State/Territory capital cities,[7] of those 58,189 Indigenous Australians who changed usual residence between 2001 and 2006, 43,257 (or 74.3%) moved to another location in the same city. However, while the analysis presented earlier on urban migration is an extension of previous analyses, very little is known about the patterns and characteristics of this intra-urban migration. Given that most of this migration is likely to be within the same, or to adjacent, labour markets, there are likely to be very different motivations and outcomes of such movement compared to moves over a much longer distance. Intra-urban migration is summarised in Table 8 for the State/Territory capital cities.

Expressed relative to the usual resident population in 2001, the first column of Table 8 gives the percentage of Indigenous and non-Indigenous Australians in each city who moved to another location in the same city. The second column shows the percentage of the population who left the city entirely. The level of intra-urban migration was highest in Brisbane, both in absolute terms and relative to the total level of migration. However, for the first five cities in the table, around three-quarters of the Indigenous population who changed location moved to another area within the city as opposed to leaving the city entirely. The two Territory capitals stand out as having relatively low rates of intra-urban migration, with migration out of the city making up a relatively high share of the total migration, for Canberra especially.

For all of the cities there was a higher rate of intra-urban migration for the Indigenous population compared to the non-Indigenous population. This reflects for the most part the higher propensity to move for Indigenous Australians identified in city areas and large regional towns in Table 1. So, with the exception of Darwin where almost three out of every ten applicable non-Indigenous residents left the city between 2001 and 2006 , intra-urban migration made up a higher proportion of total migration in the city for the non-Indigenous population.

**Table 9. Factors associated with the change in the percentage of the population employed between 2001 and 2006**

| | Indigenous | | | Non-Indigenous | | |
|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Per cent of population employed in 2001 | –0.614 | –0.600 | –0.623 | –0.185 | –0.333 | –0.418 |
| Change in per cent of population who have completed high school | 0.053 | 0.059 | 0.060 | 0.254 | 0.235 | 0.223 |
| Change in per cent of population without a qualification | –0.770 | –0.736 | –0.617 | –0.088 | –0.080 | –0.069 |
| Change in per cent of non-Indigenous population employed | 0.261 | 0.269 | 0.293 | | | |
| Change in per cent of Indigenous population employed | | | | n.s. | 0.022 | n.s. |
| Rate of outward migration | | –0.185 | n.s. | | 0.181 | 0.175 |
| Rate of inward migration | | 0.163 | | | –0.085 | |
| Rate of inward migration from city areas | | | n.s. | | | –0.167 |
| Rate of inward migration from large regional towns | | | 0.243 | | | n.s. |
| Rate of inward migration from small regional towns and localities | | | n.s. | | | –0.177 |
| Rate of inward migration from regional rural areas | | | n.s. | | | n.s. |
| Rate of inward migration from Non-Indigenous remote towns | | | n.s. | | | n.s. |
| Rate of inward migration from Indigenous remote towns | | | 0.215 | | | n.s. |
| Rate of inward migration from town camps | | | n.s. | | | n.s. |
| Rate of inward migration from remote dispersed settlements | | | –0.344 | | | n.s. |
| Constant | 27.276 | 27.568 | 27.232 | 11.611 | 17.238 | 23.759 |
| Adjusted R-Squared | 0.2195 | 0.2237 | 0.2554 | 0.2814 | 0.3275 | 0.3574 |
| Number of areas* | 510 | 510 | 510 | 522 | 522 | 522 |

**Notes:** n.s. = Variables that are not significant at the 10 per cent level of significance.
* = Those areas which had changes in outcomes for the dependent or any of the independent variables of less than –100 per cent or greater than 200 per cent were excluded from the analysis.

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

## THE RELATIONSHIP BETWEEN MIGRATION AND CHANGES IN RATES OF EMPLOYMENT IN THE AREA

The results already presented in this paper show that there was a large degree of variation across the Indigenous population in both the propensity to move between 2001 and 2006 and the destination area of those who did change their place of usual residence. For example, while there was a higher rate of migration nationally for the Indigenous population compared to the non-Indigenous population, for a number of remote IAREs the reverse was true. The main result of these changes in usual residence is a significant population redistribution with large regional towns, regional rural areas and city areas all witnessing increases in their Indigenous populations, while in the rest of Australia there was a decrease. However, within these broad classifications there is greater variation still. For example, parts of Perth had population inflows of greater than 20 per cent in net terms, whereas in parts of Sydney there were a large number of areas that experienced net outflow. Juxtaposing these patterns with non-Indigenous population redistribution leads to an even more complex picture in terms of changes in the Indigenous share of the population.

While the main direct effect of migration is on population redistribution, there are other indirect effects that are equally important, if not more so, for policy design and delivery. Biddle (2008) showed a positive association between net migration and increases in the rate of overcrowding in the area. Specifically, each additional one per cent increase in the rate of net migration was associated with an increase in the particular measure of overcrowding of 0.218 percentage points. There was, however, no association with the net migration rate of the non-Indigenous population. These results give strong empirical support for the proposition that high rates of inward migration place significant additional burdens on the housing stock which, due to the slow nature of housing construction, is not made up for by an increase in the supply.

Inward migrants also compete with the existing population for jobs. However, they bring with them, or attract additional financial resources that are often spent in the local area. Given that labour markets are much quicker to adjust than housing markets, the net effect is more difficult to predict a priori. Ultimately, therefore, empirical analyses are required to test the competing theoretical effects, and in this final section of results, the association between rates of migration and changes in rates of employment in the area is considered.

For the results presented in Table 9, the dependent variable is the change in the percentage of the population who were employed between 2001 and 2006. Indigenous and non-Indigenous Australians are modelled independently across three separate models each. The first model (Model 1) has as its independent variables historic and human capital variables only, including the percentage of the population employed in 2001, the change in the percentage of the population who have completed Year 12, and the change in the percentage of the population who have not completed a qualification. The final variable in Model 1 is the change in the percentage of either the non-Indigenous population who are employed between 2001 and 2006 (for the Indigenous estimates), or the change in the percentage of the Indigenous population who are employed (for the non-Indigenous estimates). These variables are designed to capture general labour market conditions in the area.[8]

The second model (Model 2) includes all those variables from Model 1, as well as two variables for the rate of outward and inward migration for the respective populations between 2001 and 2006. Model 3 also includes outward migration (as well as the historic and human capital variables). However, inward migration is disaggregated by the location type of the source area. That is, the number of people who moved into the area from a city area (as a percentage of the usual resident population in 2001), the number of people who moved into the area from a large regional area and so on.

The results presented in Table 9 for Model 1 conform to a priori expectations regarding the historic and human capital variables. Areas with a high percentage of the population employed in 2001 were more likely to experience a decline during the intercensal period that followed. This represents for the most part a process of reversion to the mean. Following standard human capital theory, increases in the percentage of the population who had completed Year 12, or decreases in the percentage without a qualification, were associated with improvements in employment-to-population percentages. Finally, changes in the non-Indigenous percentage of the population who were employed were positively associated with changes in the Indigenous population percentage. The reverse, however, was not true. Clearly, the non-Indigenous employment-to-population percentages were a better indication of the area-specific economic conditions.

The association between migration and changes in employment percentages is in a different direction for the Indigenous compared to the non-Indigenous population. In the former, population increases from migration are associated with improved employment outcomes, represented by the negative coefficient for outward migration and the positive coefficient for inward migration. However, the opposite is true for the non-Indigenous population, with population decreases associated with improved employment outcomes. The association with outward migration is somewhat intuitive, in that it is to be expected that the non-Indigenous population would have a greater impact on aggregate labour supply, given their much higher share of the area population. However, it is somewhat surprising that non-Indigenous inward migration had a negative association with changes in employment outcomes, as it would be expected that the impacts on labour demand would be larger for the non-Indigenous population.

There are two potential explanations for why inward Indigenous migration has a positive association with Indigenous employment. Firstly, it may be that through Indigenous-specific employment programs like CDEP (which was still quite prevalent at the time of the 2006 Census), jobs follow those who change their area of usual residence. It is not possible to test this empirically using the data available, however it is unlikely to be the sole explanation, given the fact that similar results to those presented in Table 9 were found when the estimation was restricted to major cities and large regional towns, where these employment programs made up only a small component of the labour market.

The alternative explanation is that the employment outcomes of those who moved areas were either already superior to those who stayed in the same area of usual residence or were substantially improved by the act of moving. That is, keeping in mind that the employment-to-population percentages in both 2001 and 2006 include those who eventually moved and those who stayed, it may be a compositional effect related to the characteristics of those that move. The results for Model 3 show that there are potential compositional effects. For the Indigenous population, inward migration from large regional towns or Indigenous remote towns was associated with improvements in employment percentages. However, inward migration from remote dispersed settlements was associated with a significant and substantial decline in employment percentages.

This compositional effect will need to be tested using individual data from the 2006 Census. However, this latter finding is an important cautionary note, as it shows that a reduction in the CDEP Program or any other policy change that results in large-scale outward migration from remote dispersed settlements could potentially lead to a significant deterioration in employment outcomes in the areas where people move to. This point is further reinforced by the fact that the coefficient on the rate of inward migration from remote dispersed settlements is 0.683 when remote dispersed settlements themselves are removed from the estimation.

## CONCLUDING REMARKS

Population movement can have significant impacts on the ability of all levels of government to design forward-looking policy at a local level that takes into account the share of the population that identifies as being Indigenous. The aim of this paper was to consider a number of related aspects of Indigenous migration using results from the most recent census. This includes the propensity to move, population redistribution, migration patterns and flows, urbanisation and intra-urban migration. Many of the results from the analysis that have already been discussed could feed directly into policy planning and, when combined with information on births and deaths, population projections.

In addition to the specific results, there were a number of insights that cut across all the analysis. The first of these was that, when it comes to explaining Indigenous migration, not only does demography and geography matter, but so too does the interaction between the two. For example, the results in the paper show that Indigenous Australians in non-remote parts of the country follow a similar life cycle pattern of migration when compared to the non-Indigenous population, whereas those in remote Australia have a very flat distribution. Also, it is shown that much of the migration to city areas and large regional towns from the rest of Australia occurs between the ages of 10–24, and that this net urbanisation is dominated by Indigenous females.

Another major finding from the analysis is the complexity of Indigenous urbanisation. On the one hand, the finding that there was net outward migration from remote Australia of –4.36 per cent over the 2001 to 2006 period could suggest a rejection of outstations and Indigenous towns for regional Australia and the cities. However, this simplistic view is countered somewhat by the finding that although 8,366 people were counted as moving from remote to non-remote Australia, there were still 4,523 people who moved in the opposite direction, and 79,650 who stayed there throughout the period. Furthermore, while there was net outward migration from remote Australia of the Indigenous population, the rate for the non-Indigenous population (–14.0%) was over three times higher. Finally, once distance and socioeconomic characteristics of the areas were controlled for, Indigenous Australians who moved out of a non-remote area were in fact more likely to move to a remote area rather than another non-remote area. A more complex picture therefore emerges of a remote Australia that is continuing to become more Indigenous over time and that has substantial churn or reciprocal migration with non-remote Australia.

Finally, there are two important results from the analysis presented in this paper that point to the potential interaction between migration and labour market outcomes. At an individual level, those who move to city areas and large regional towns do not do as well in the labour market as those who already live there and may even do worse than those who stay in the rest of Australia. At an area level, inward migration from remote dispersed settlements in particular was associated with a significant and substantial decline in the percentage of the population employed in the destination area.

While not demonstrating causality, these two results highlight the potentially fraught relationship between migration and employment policy. Although governments may have a fiscal motivation to encourage Indigenous Australians to move from non-urban to urban Australia, those who do move may struggle to compete in the private sector labour markets that they find there. When combined with information on housing (Biddle 2008), there may even be negative externalities for those Indigenous Australians who already lived in the area. If the poor labour market outcomes of those who do move into the area continue, there may be flow-on effects in terms of increased crime rates and social conflict.

# NOTES

1. Propensity to move as well as inward, outward and net migration rates for all 531 IAREs are available as a .csv file for download at <http://www.anu.edu.au/caepr/Publications/WP/2009WP58.php>.

2. Given the geographic nature of the dependent and independent variables there is the strong possibility of spatial autocorrelation in the data. This is a subject of ongoing research by the author.

3. A full migration matrix of Indigenous Regions is available from the author on request.

4. An alternative specification was also tested, namely the raw count of the number of people who moved between the source and destination areas. After assuming a Negative Binomial distribution, using the total number of people who moved out of the source area as a measure of exposure and estimating the parameters via Maximum Likelihood, conclusions did not differ qualitatively from those found using the simpler OLS methodology. Spatial econometric techniques to control for spatial dependence is an ongoing avenue of research on the dataset.

5. Clearly the labelling of city areas and large regional towns as 'urban Australia', and small regional towns, regional areas and remote parts of the country as 'non-urban Australia' is an over-simplification. There are many urban centres in the latter grouping and some semi-rural areas in the peri-urban fringe of the former. The labels are used for the sake of convenience in the figures only. Futhermore, because of the large net inward migration experienced over the 2001–06 period and the role it plays as a service hub in central Australia, Alice Springs is re-classified as 'urban Australia' rather than a 'remote town' for the purposes of this section. Conclusions are not sensitive to this inclusion, with results available from the author upon request.

6. Unfortunately, because of confidentiality constraints imposed by the ABS, it is not possible to separately identify those who moved to urban areas between 2001 and 2005 from those who moved there between 2001 and 2006. If it was possible to do so, this would likely lead to a greater gap between long-term and recent migrants.

7. The boundaries for the capital cities are based on the respective Indigenous Regions. The two exceptions are Adelaide and Hobart, which are instead based on the respective Statistical Divisions.

8. There is a large degree of potential endogeneity with this last variable and it is important to note that other results are not sensitive to its inclusion.

# APPENDIX

The following tables contain the data that underlies Figs 4 and 5. That is, location type in 2001 by location type in 2006, firstly for Indigenous Australians (Table A1), then for non-Indigenous Australians (Table A2).

## Table A1. 'Four-corner' migration between location type groupings: Indigenous Australians, 2001–06

| | Location type: 2006 | | | |
|---|---|---|---|---|
| Location type: 2001 | City Areas | Large regional towns | Small regional towns and rural areas | Remote areas |
| City areas | 105,678 | 5,810 | 5,250 | 1,344 |
| Large regional towns | 6,391 | 65,113 | 4,974 | 2,000 |
| Small regional towns and rural areas | 5,186 | 6,592 | 55,874 | 1,179 |
| Remote areas | 2,819 | 3,781 | 1,765 | 79,650 |
| Remote dispersed settlements | 1.75 | 4.02 | 1.23 | 29.60 |

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

## Table A2. 'Four-corner' migration between location type groupings: Non-Indigenous Australians, 2001–06

| | Location type: 2006 | | | |
|---|---|---|---|---|
| Location type: 2001 | City Areas | Large regional towns | Small regional towns and rural areas | Remote areas |
| City areas | 10,499,112 | 258,649 | 225,050 | 25,100 |
| Large regional towns | 230,503 | 2,080,826 | 123,104 | 14,484 |
| Small regional towns and rural areas | 182,926 | 153,196 | 1,686,717 | 13,163 |
| Remote areas | 34,512 | 27,794 | 22,324 | 142,978 |
| Remote dispersed settlements | 1.75 | 4.02 | 1.23 | 29.60 |

**Source:** Author's calculations using the ABS Census of Population and Housing 2006.

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