



**Investigating temporary mobility in Australia:  
contemporary measures using data from the 2001 Census**

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Discussion Paper 2003/03

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## **Abstract**

Although temporary mobility in Australia, like many western countries, has been increasing in significance, this has not been associated with a corresponding increase in systematic research. We address this issue and explore the structure of temporary mobility, in comparison to permanent migration, by using a set of contemporary systematic, quantitative measures to analyse the comprehensive data from the 2001 Census. This foundation is provided by reference to four key dimensions namely intensity, distance, connectivity and impact. The results show that temporary mobility clearly differs from permanent migration in all four of these dimensions: not only do temporary movers display different age-sex profiles, but temporary movements occur over longer distances, have greater levels of connectivity and have a greater impact on settlement patterns. We seek explanations for these differences and to conclude, highlight worthwhile avenues for further research in this field.

## **Acknowledgments**

This work was financially supported by the Australian Research Council (grant DP0210455 – Circular Mobility in Australia) and a collaborative research agreement with the Queensland Government Office of Economic and Statistical Research.

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## **Contents**

<i>Abstract</i>	ii
<i>List of Tables</i>	iv
<i>List of Figures</i>	iv
Introduction	1
Research into temporary mobility	1
Migration intensity	3
Migration distance	4
Migration connectivity	5
Migration impact	7
Conclusions	9
Literature cited	11

## List of Tables

<b>Table 1</b>	People counted away from home 1976-2001
<b>Table 2</b>	Sources of temporary movers and permanent migrants, Australia
<b>Table 3</b>	Source of temporary movers by state and territory
<b>Table 4</b>	Coefficients of variation for inflows, outflows and gross flows of temporary and permanent migration, sum of Statistical Divisions in Australia
<b>Table 5</b>	Migration impact scores for temporary mobility and permanent migrants for all Statistical Divisions in Australia

## List of Figures

<b>Figure 1</b>	Age-sex profiles of permanent migrants 2000-2001, Australia
<b>Figure 2</b>	Age-sex profiles of temporary movers 2001, Australia
<b>Figure 3</b>	Statistical Divisions (SDs) and Statistical Local Areas (SLAs) by proportion of movers
<b>Figure 4</b>	Percent net permanent migration (2000-2001), quintiles, Statistical Divisions of Australia
<b>Figure 5</b>	Percent net temporary migration (2001), quintiles, Statistical Divisions of Australia
<b>Figure 6</b>	Permanent and Temporary net migration, LGAs and pLGAs, Queensland
<b>Figure 7</b>	Temporary net migration, SLAs, Brisbane City

## **Introduction**

Contemporary analysis of migration has primarily focussed on the processes and impacts associated with permanent movement – defined and measured as a change in usual residence between two periods of time. Principally this is because permanent migration is the key mechanism that generates change in human settlement patterns. With the decrease in the friction of distance and cost of travel, there has been a commensurate increase in the frequency of moves together with a change in the forms of population movement. One aspect has been the rise in temporary mobility – movements that involve one or more nights stay away from home, but do not entail a lasting change of usual residence. Although temporary mobility in Australia, like many western countries, has increased in significance, this has not been associated with a corresponding increase in systematic research. Whilst certain aspects of temporary mobility have received considerable attention – tourism being a notable example, most notable by its omission is an overall structure in which to situate this research.

The 2001 Australian Census provides a window of opportunity in which the key characteristics of temporary mobility can be studied. The de facto nature of the Australian Census requires people to be counted in their actual location on census night. However a question concerning place of usual residence is also included. Combining place of enumeration and place of usual residence provides vital information on the numbers of people who are temporarily absent from home, their patterns of movement and their characteristics. We use this information to study four dimensions of mobility: intensity, distance, connectivity and impact. Comparisons are made with permanent migration to examine differences and similarities between the two forms of movement.

## **Research into temporary mobility**

Research into temporary mobility has largely been ignored in the social sciences as it falls between the two more commonly researched disciplines of tourism and migration (Gober and Mings 1984). There is a burgeoning body of systematic work in these two areas but analysis, to date, on temporary mobility is considerably more sparse, fragmented and without any overriding structure (Bell and Ward 2000). Much of the existing work, especially in developing countries, has adopted an ethnographic approach.

Examples of this form of research in the developed world include the analysis of seasonal migration among the elderly (Longino and Marshall 1990; Pollard 1996; Mings 1997), long distance commuting (Green *et al.* 1999; Jansson 1999) and cyclic mobility such as fly-in/fly-out mining operations (Faulkner 1998). It is evident that this research has focussed on examining particular types of movement, specific population groups or selected local areas. The results provide us with a wealth of descriptive knowledge of temporary mobility but few quantitative, measurable outcomes.

A substantial obstacle to producing quantitative measures regarding temporary mobility is a lack of high quality data. In one of the earliest quantitative studies, Gober and Mings (1984) identified severe data deficiencies in their study of interstate flows of nonpermanent residents in the US. In the case of the US Census, a question on non permanent residency was included to return persons away from home to their usual place of residence – a requirement of the de jure census. However, whole households had to be temporarily absent and outside of their census district of usual residence, to be recorded as such. The resulting emphasis of their work, as they state, was “... on pattern rather than the magnitude of the movement” (Gober and Mings 1984, p166). The data available for that study also severely limited the spatial detail and provided no real information of mover characteristics.

More recent attempts to study temporary mobility have been made by Bell and Ward (1998; 2000). These studies, focussing on Australia, also use census data but have access to a far richer dataset than provided by many other national censuses in respect of temporary mobility. The primary reason for this is that information is available for individuals regardless of whether they were staying in private or public dwellings and so is not constrained by the whole household requirements of the US. This provides data not only on the number of people temporarily away from home, but also provides the facility to build detailed profiles of temporary movers through the analysis of their responses to the multi-part census questions. Since the Australian Census asks some 46 questions and involves a complete enumeration, rather than a sample, this offers considerable potential. Furthermore, questions regarding place of usual residence are coded to one of over 1300 SLAs (Statistical Local Areas). This enables the analysis of moves that occur within *and* between small areas, thus permitting research at a much finer level of spatial resolution.

The major limitations, of course, are that the census provides only a snapshot at one particular point in time, and fails to capture several of the key dimensions of temporary mobility that differentiate it from permanent migration: seasonality, duration and repetition. Despite these shortcomings, census data provide an invaluable window on a rarely studied process.

This paper aims to develop the recent work of Bell and Ward (1998; 2000) to capture the structure of temporary mobility by using a set of contemporary systematic, quantitative measures to analyse temporary mobility data from the 2001 Census. We provide this foundation by reference to the four key dimensions identified by Bell *et al.* (2002) in recent comparative studies of permanent migration, namely their intensity, distance, connectivity and impact. These measures can be understood to quantify the amount, or level, of mobility (intensity), the distance travelled (distance), the relationship between regions signified by the magnitude of flows (connectivity) and finally the extent to which settlement patterns are transformed (impact). Bell *et al.* (2002), with regard to these key dimensions, discussed the different methods available to produce quantitative measures of permanent migration. The intention of their research was to permit cross national comparisons of permanent migration, in their case between Australia and the UK, though the methods are applicable to all countries where suitable data are collected (see Bell 2002). Here we adopt the same battery of measures to explore and quantify differences between temporary mobility and permanent migration.

## **Migration intensity**

Temporary mobility has rapidly been rising in significance, as is readily evident from the absolute increases in the number of people temporarily away from home on census night (Table 1). This is despite the change in census date in 1991 to avoid school holidays and lessen this effect. In contrast, permanent migration has remained relatively constant at approximately 42% of the population having moved at least once over the five years between censuses (Bell and Hugo 2000). Calculation of crude migration intensities show that since 1991 approximately 1 in 20 (5%) of the population were temporarily away from home on census night. This equates to over 1 million people in 2001, which represents a 6.4% increase on the 1996 figure. The intensity of temporary mobility is considerably smaller than that of permanent migration, but it must be remembered that the permanent migration figures include all people who have migrated at least once during the five year intercensal period, whilst the temporary mobility figures correspond to the situation on one specific night.

An enduring facet of permanent migration is the age and sex profile of the migration intensity curve (Rogers and Castro 1981). The age profile of permanent migration is typically characterised by a small rise among young children followed by a peak among young adults, a decline in middle age, followed by an increase in later life (Figure 2). The reasons for these peaks and troughs are widely attributed to events occurring in the life course – family formation and dissolution, employment, marriage and the onset of disability. Intensity curves of temporary mobility, though, show a very different profile (Figure 3). Mobility is still most intense amongst young adults, followed by a trough in middle age, but there is a marked increase at retirement age. Interestingly, there is also a peak for both males and females at age 11. Further differences include a dominance of males undertaking temporary moves, even at ages 20-25 where females are the dominant permanent migrants and a double gender crossover either side of retirement age. It is evident that different processes are operating to produce these trends. The peak amongst young adults can be attributed to many factors including education and the prolonged fledgling stage of leaving home characterised by short term absences and return moves. Temporary mobility during the labour force years is a product of job related, production-oriented moves: business travel, long distance commuting and accessing shifting worksites, such as that undertaken by fly-in/fly-out miners who work for a period of weeks at a time in remote inland areas. Males dominate in these occupational groups. The peak in temporary movements around retirement age suggests that these moves are consumption related – they occur through the pursuit of pleasure resulting from the freedoms from family and work that early retirement brings. It is evident that in these circumstances temporary mobility is substituting for permanent migration – rather than a permanent move to be closer to work or to a more conducive environment for retirement, temporary mobility is a mechanism through which individuals can reap the benefits of their temporary destinations, without fully severing ties with their place of origin.

## **Migration distance**

Permanent migration exhibits a notable distance decay effect – over 80% of permanent moves in Australia between 1996 and 2001 were within the same state and almost one third occurred within the same SLA (Table 2). Comparatively longer distance moves, those occurring between states and from overseas, contributed the remaining 20%. Contrasting with the picture for permanent migration, the distance decay effect seems to have little impact on temporary moves. Temporary moves tend to involve longer distances with over 42% of



moves, a total of over 440,000 people, occurring between states or from overseas. Moreover, short distance moves within an SLA accounted for just 12% of all temporary moves, compared to 30% of permanent migrations.

Analysis of the sources of temporary movers by state and territory reveals marked variations (Table 3). Most notable of these differences is the fact that 16.5% of people enumerated within the Northern Territory were away from home and that over half of these temporary movers were usually resident in a different state. These figures are consistent with previous findings (Bell and Ward 1998). One of the main reasons for such a high proportion of non-permanent residents from interstate can be found in the Territory's economic base of tourism and mining activities. These two industries rely on a constant turnaround of temporary residents – either as tourists or as part of fly-in/fly-out mining operations to the more remote inland areas.

Further points of interest are the low levels of interstate moves made to Victoria, South Australia and Tasmania and the relatively small percentage of moves made within the Australian Capital Territory (ACT). These results are almost certainly a product of the relative isolation of South Australia and Tasmania and the small geographic size of the ACT. Reasons for the lack of interstate moves to Victoria are not readily apparent, though could largely be a factor of climate and comparatively few natural resources to draw large numbers of production led temporary movers into the area.

## **Migration connectivity**

Migration connectivity, the patterns of flows, is one of the most widely reported aspects of temporary mobility as it features highly in the ethnographic literature (for example Bedford 1973; Chapman and Prothero 1983). It is not surprising that within a regional migration system flows from certain areas are focussed on specific destinations and vice versa. A well documented example of this is the retirement migration pattern of the US (Rogers 1992; Rogers and Raymer 1998). An interesting question, though, is whether temporary mobility is any more or less focussed than permanent migration.

There are a number of possible measures that can be employed to quantify the spatial patterning of migration flows, though following the assessment of Bell *et al.* (2002), the number of easily applicable measures is considerably more limited. Here we use the

coefficient of variation (CV) for this task mainly due to its relative ease of computation. Rogers and Raymer (1998) also argue that the CV provides a more “common sense” interpretation of migration concentration but this is at the cost of lacking any logical limits, as in the case of measures such as the GINI index (Plane and Mulligan 1997; Bell *et al.* 2002).

Adopting a system wide approach at the Statistical Division (SD) scale, we included 58 SDs in our analysis, omitting the Off-shore and Migratory areas and flows from undefined origins. For these 58 zones three measures of spatial focussing were calculated for permanent migration and temporary mobility: a measure for inflows, another for outflows and an aggregate figure of all movements (Table 4). Considering first the aggregate scores it is evident that there is a higher degree of focussing, shown by a higher coefficient of variation, for permanent migration than for temporary mobility. The difference in focussing between permanent migration measured over five years and over one year is negligible. The CVs for the three inflows are very similar, so it is the lower degree of focussing in the outflow of temporary migrants that is the cause of the lower aggregate score. The implication is that temporary inflows to a destination zone come from relatively fewer locations (implying higher spatial focussing) whilst outflows travel to a larger number of zones (implying less spatial focussing). Thus permanent migration generates less connections between the system of zones than does temporary migration, and this higher connectedness via temporary movements is due solely to the scattered nature of outflows. In short temporary movers choose a broader range of destinations.

This is an unexpected result as it was anticipated that temporary mobility would be more focussed than permanent migration. Primarily this was believed because people move for specific reasons, thus making certain areas more attractive. A possible reason why permanent migration appears more focussed could be due to the scale of analysis. Statistical Divisions are characteristically large areas, with the exception of those in the ACT, that consist of heterogeneous populations and services. Grouping such diverse populations and services together could be masking spatial concentrations operating at a finer scale. It should also be noted that although temporary mobility appears to be less focussed than permanent migration, it needs to be investigated whether the same areas are similarly connected irrespective of mobility type. Preliminary analysis of this complex process has shown that, with regard to permanent migration, zones with highly focussed inflows are also highly focussed in their outflows ( $r^2$  0.81), a situation that is not true for temporary mobility, which showed a lower level of correlation ( $r^2$  0.19). This suggests that while zones that have few tightly focussed

connections for permanent inflows are likewise connected for outflows, this does not hold in the case of temporary moves. Further research is required to fully investigate these functional links that exist between zones.

## **Migration impact**

This final section measures the extent to which temporary mobility, compared to permanent migration, is effective at redistributing population across the settlement system. Two different measures are used to investigate this process, which although computationally similar, reveal different insights into population redistribution. The Migration Effectiveness Index (MEI) measures the (dis)equilibrium or a(symmetry) between interregional flows, while the Aggregate Net Migration Probability (ANMP) measures the amount of population redistribution arising out of net migration balances (Bell *et al.* 2002). Again the analysis focuses on Statistical Divisions.

It is clear from both measures that temporary mobility is a more effective mechanism for transforming settlement patterns (Table 5). Both the MEI and ANMP are considerably higher for temporary mobility than for permanent migration. Bell (2000) also found that MEI was higher for temporary mobility, though in contrast, found that the net migration rate was higher for permanent migration. This led him to conclude that, with regard to temporary mobility, higher effectiveness offsets lower intensity. We have not found this to be case here – temporary mobility shows higher effectiveness *and* intensity than permanent migration. The most likely cause of this difference is the scale of analysis – Bell (2000) used 686 zones and we use only 58. Most permanent moves are over short distances (Table 2) and so occur within SDs. These intra area moves are not included in the calculation of these measures and so result in a lower migration probability. Temporary moves are more likely to occur over longer distances and so are not affected to the same extent (a smaller percentage of moves are omitted in the calculation), thus explaining why at the SD scale net migration probability is higher for temporary mobility than permanent migration.

Further examination of the net migration rates across individual regions reveals interesting differences between the two processes. Net rates show that temporary mobility has a small effect on a large number of SDs, accounting for less than 5% of the enumerated population in 66% (38) of zones (Figure 3). However, there were also 10% (6) that experienced absolute net

flows of over 15% of the enumerated population. In contrast, net rates for permanent migration are less extreme – 90% of SDs experienced absolute net migration rates of between 2% and 10%. Considering absolute net temporary mobility rates for Statistical Local Areas (SLAs) produces even more extreme results. Of the 1350 SLAs, 80% (1080) recorded absolute net temporary mobility rates of below 5% or above 15%. These statistics show most, if not all, areas are affected to some extent by temporary movers, but that there are a considerable number of areas that are greatly affected by temporary movers. This is consistent over two, very different, scales of analysis.

The pattern of the net flows also reveals marked differences between the two types of mobility. Bell (1995) identifies four key processes characterising permanent migration; of interest in relation to this study are movements from the inland to major cities and the subsequent counter-urbanisation from inner city areas to adjacent peri-urban and coastal regions. It is evident that the first of these processes is still operating at the SD scale (Figure 4). The quintile of greatest negative net migration, migration losses, clearly comprises inland areas. Correspondingly the greatest net gains are made in the metropolitan and coastal SDs that contain the major cities of Brisbane, Sydney, Melbourne, Adelaide and Perth. In contrast net gains of temporary movers are sourced almost exclusively in the more remote parts of Western Australia and the Northern Territory (Figure 5). The exception is South Eastern New South Wales which is a large net gainer of both temporary and permanent migrants. Patterns of net out migration show the greatest net losses were recorded in south-eastern and Western Australia.

Considering the second of Bell's (1995) key findings, counter-urbanisation, we focus on South East Queensland adopting a Local Government Area (LGA) scale geography of temporary migration and a geography of LGAs and pseudo-LGAs (pLGA) for permanent migration. It is evident that all net gains made through permanent migration are occurring in coastal areas (Figure 6). There is a continuous pattern from the Gold Coast in the south to Noosa in the north of the region, though this also extends to Cairns in the far north of the state (not shown). Brisbane City, which is divided into inner and outer cores, also shows net gains through permanent migration. The process of counter-urbanisation, resulting in gains in outer areas, reflects the attractiveness of these suburbs to couples starting to raise families. Of greatest note is Coomera Cedar-Creek, a site of substantial residential development, which recorded a permanent net migration gain of 9.2%. Inner city gains are also evident, occurring through in-migration of young professionals (DINKS) seeking the inner city life. This is a consistent trend with other studies (for example see Vipond *et al.* 1998). Contrastingly, temporary migration displays losses of up to 5% in Brisbane City LGA and its surrounds. Considering the high level of intra-state temporary movement, shown in Table 3, and the

temporary net gains made in Queensland's inland areas, shown in Figure 5, it is likely that the suburban areas are the sources from which the temporary movers originate. Temporary net migration gains, paralleling the gains from permanent migration are evident along the eastern seaboard. However, these coastal gains are focussed on two localities – the Gold Coast in the south and Noosa further north, with net losses experienced in between. These are well known tourist areas within Queensland and so where net gains of temporary migrants are unsurprising.

Although Brisbane LGA as a whole is experiencing temporary net migration losses, this masks considerable variations within the LGA. The SLAs within Brisbane City that form the core area, north of the river, are all net gainers of temporary migrants, especially the key areas of City Inner and City Remainder which recorded net gains of 152% and 58% respectively (Figure 7). Other SLAs that registered large net gains were Herston (50%), the location of a large hospital and Bowen Hills (30%), an area that has seen considerable redevelopment to attract businesses to the locale. Most other areas show net losses, most likely to the city or coastal areas, which contribute to the overall figure of 1% net migration loss for Brisbane LGA.

## **Conclusions**

Temporary mobility is rapidly rising in significance and correspondingly research in this field has started to gather momentum. However, analysis has tended to follow a descriptive approach, which focuses on specific examples, but does not provide firm foundations for future research. With the advantage of access to comprehensive data on temporary movers, we have built upon earlier work in this field by adopting a systematic approach that has been used to study permanent migration. By providing quantifiable measures we have been able to systematically review the key aspects of temporary mobility and identify considerable contrasts between this process and that of permanent migration.

The results show that the numbers of people temporarily away from home on census night have been steadily increasing whereas in contrast permanent migration rates have remained stable. In addition we have shown that the age profile of temporary movers is very different from that of permanent migrants; characterised by bi-modal peaks among young adults (due to educational reasons) and at retirement age (resulting from their recent exit from the workforce and family commitments).

Temporary movers are more likely to move longer distances, often interstate and overseas, whilst permanent migrants more frequently move locally or intra state. The individual states

and territories also display their own patterns of temporary movements. Northern Territory has a high percentage of temporary movers, many of whom have moved interstate, explained by the economic base of tourism and mining on which the Territory is founded. Contrastingly, the geographic isolation of Western Australia and Tasmania resulted in very few interstate moves.

Analysis of migration connectivity provided interesting and surprising results. It was anticipated that temporary moves would be more spatially focussed than permanent migrations. Coefficient of variation scores, though, did not show this. This may be a product of the scale of analysis, but systematic patterns apparent clearly invite further research.

Finally the spatial patterning of temporary migration also displayed a marked difference to that of permanent migration. Overall temporary moves were more efficient as a mechanism for distribution and showed substantial impact on the settlement pattern. Most areas experienced a small to medium impact of permanent migrants in the region of 5-10% of the enumerated population. In contrast, temporary movers exerted a significant impact of more than 10% of the enumerated population in many areas. This pattern was even more marked at the finer SLA scale. Additionally the patterns of net migration revealed the complimentary and substitutional roles that temporary moves play to permanent migrations within inland and city regions: supplementing the loss of permanent out migrants with temporary, short-term, gains of in migrants, in some places, but complimenting long term with short term gains in others.

To conclude, it is evident that temporary mobility clearly differs from permanent migration and that temporary mobility patterns vary over different geographic scales. The research presented here, which is explorative in nature, invites considerable further work. Each of these four key dimensions can be refined, for example: using spatial interaction models to explicitly study distance decay effects and analysing the different attributes of the individuals involved. Beyond this it needs to be remembered that the census only provides a snapshot of this dynamic process promoting the need to integrate additional data. The pursuit of this line of enquiry yields wide-ranging opportunities for developments in theory and methods as well as being of substantial importance for planning policy.

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**Table 1: People counted away from home 1976-2001 (Source: ABS)**

Census Date	Number	% of population	Five Year Change	
			Number	Percent
30/06/76	68 122	5.1		
30/06/81	855 229	5.9	167 107	24.3
30/06/86	721 892	4.6	-133 337	-15.6
06/08/91	817 421	4.9	95 529	13.2
06/08/96	972 780	5.4	155 359	19.0
06/08/01	1 034 948	5.5	62 168	6.4

**Table 2: Sources of temporary movers and permanent migrants, Australia (Source: ABS)**

Movers From	Number	% of total	% of temporary movers	% of permanent migrants 1996-2001
Same SLA	125 030	0.7	12.1	30.1
Other SLA same state	466 236	2.5	45.0	50.1
Interstate	240 663	1.3	23.3	10.5
Overseas	203 019	1.1	19.6	9.3
Counted away from home	1034 948	5.5	100.0	100.0
Counted at home	17 934 573	94.5		
<b>Total Count</b>	<b>18 969 521</b>	<b>100.0</b>		

**Table 3: Source of temporary movers by state and territory (Source: ABS)**

State or territory	% of enumerated population from				Total temporary movers (%)	Total number of temporary movers
	Same SLA	Other SLA same state	Interstate	Overseas		
New South Wales	0.8	2.2	0.8	1.0	4.8	306129
Victoria	0.6	2.0	0.6	0.7	3.9	181034
Queensland	0.5	3.1	2.6	1.9	8.1	295159
South Australia	0.5	2.4	0.9	0.6	4.3	63602
Western Australia	0.7	3.5	1.1	1.0	6.3	116423
Tasmania	1.0	2.2	0.9	0.4	4.5	20684
Northern Territory	0.6	3.4	8.8	3.8	16.5	34763
Australian Capital Territory	0.2	1.5	2.9	0.9	5.8	17154
<b>Australia</b>	<b>0.7</b>	<b>2.5</b>	<b>1.3</b>	<b>1.1</b>	<b>5.5</b>	<b>1 034 948</b>

**Table 4: Coefficients of variation for inflows, outflows and gross flows of temporary and permanent migration, sum of Statistical Divisions in Australia (Source: ABS)**

	Out flows	In flows	Aggregate
Temporary mobility	1.978	2.292	4.270
Permanent migration 2000-2001	2.382	2.353	4.734
Permanent migration 1996-2001	2.425	2.324	4.749

**Table 5: Migration impact scores for temporary mobility and permanent migrants for all Statistical Divisions in Australia** (Source: ABS)

	<b>MEI</b>	<b>ANMP</b>
<b>Temporary mobility</b>	27.9	0.68
<b>Permanent migration 2000-2001</b>	8.00	0.27

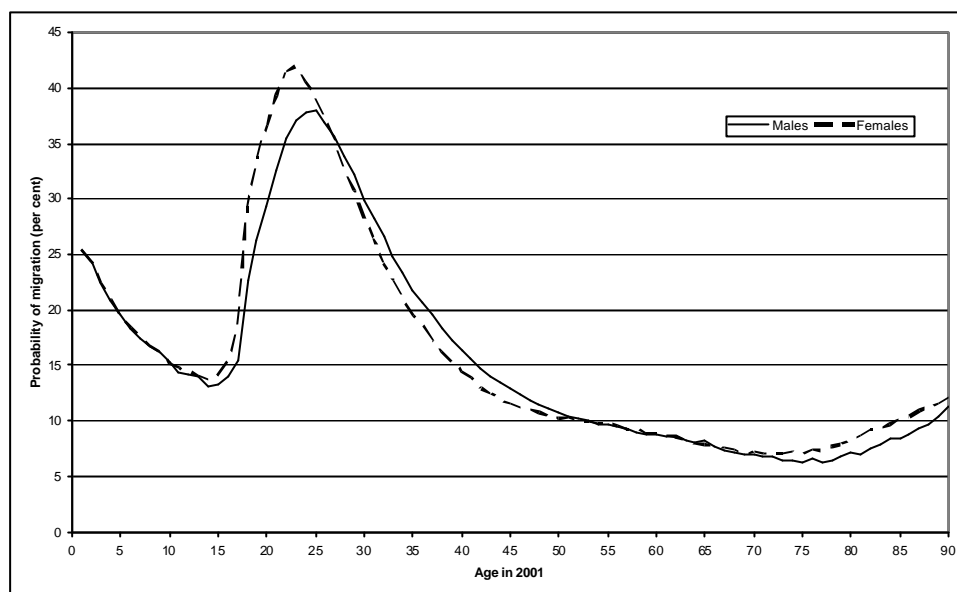


Figure 1: Age-sex profiles of permanent migrants 2000-2001, Australia (Source: ABS)

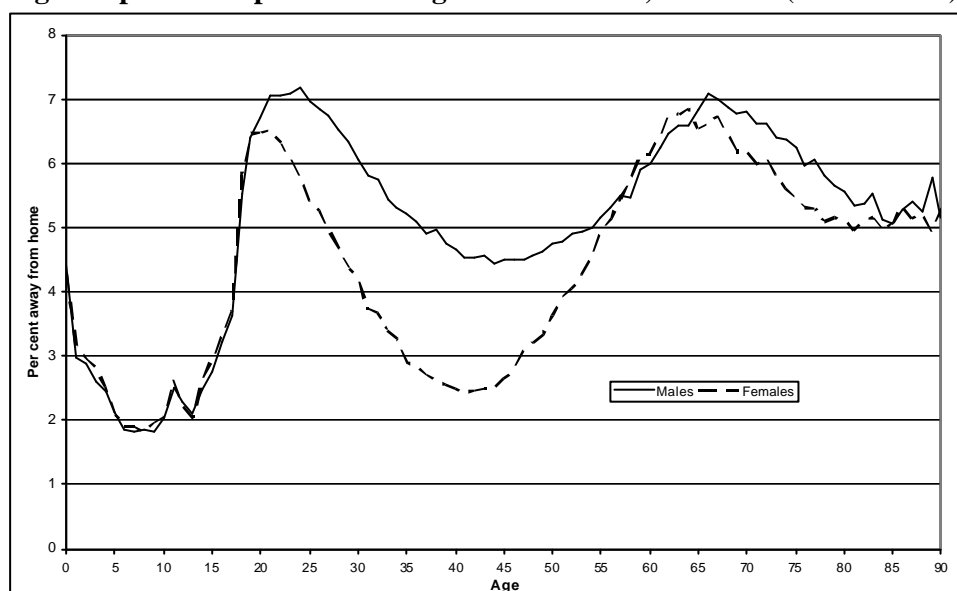
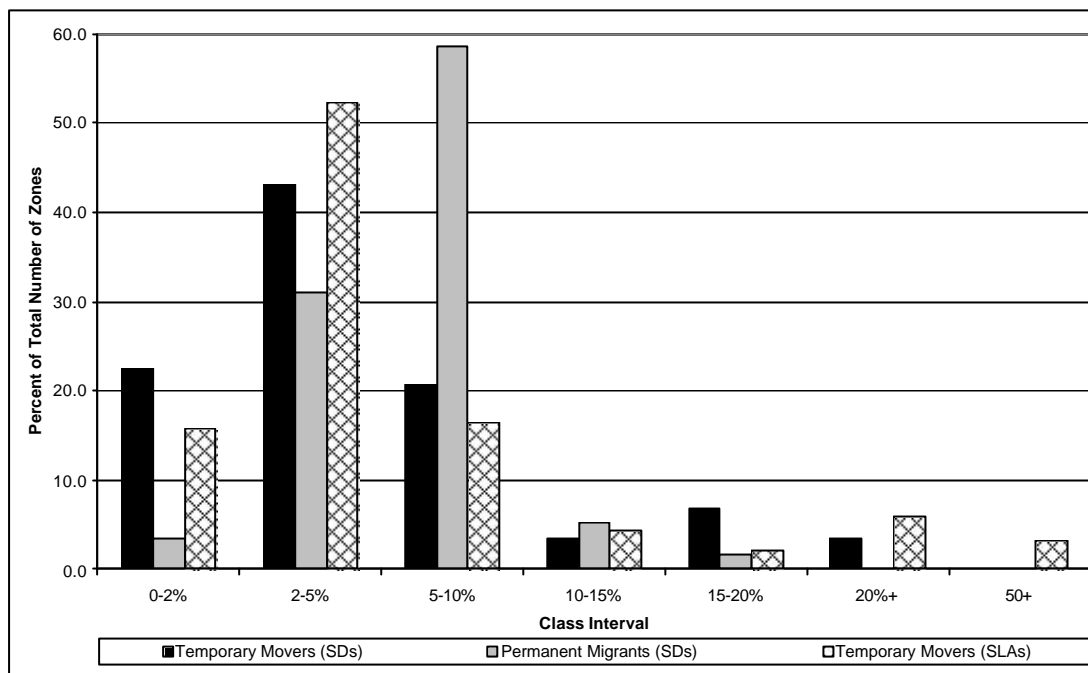
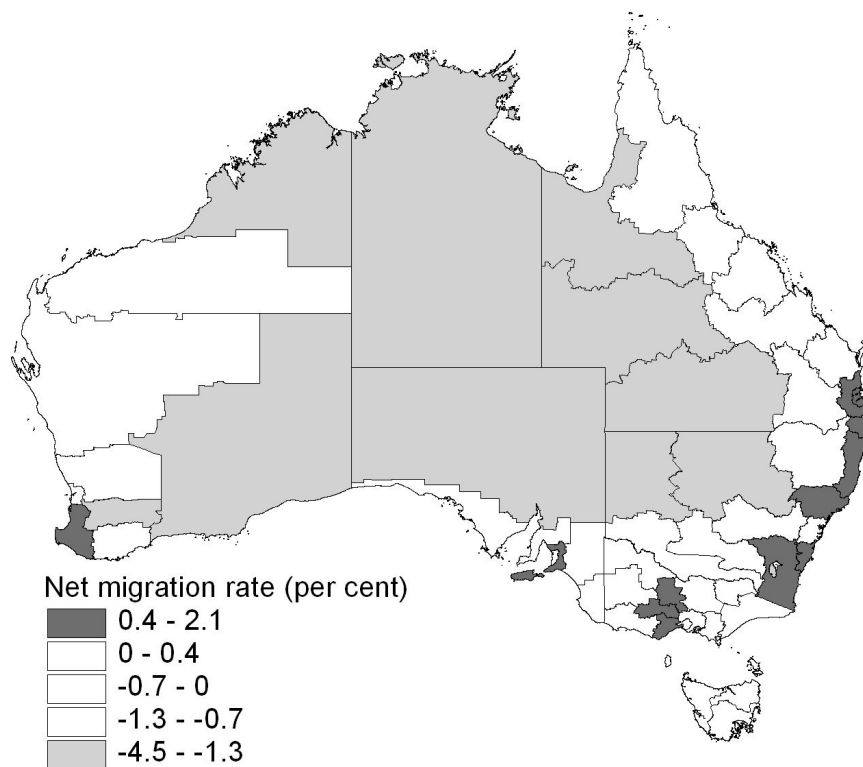


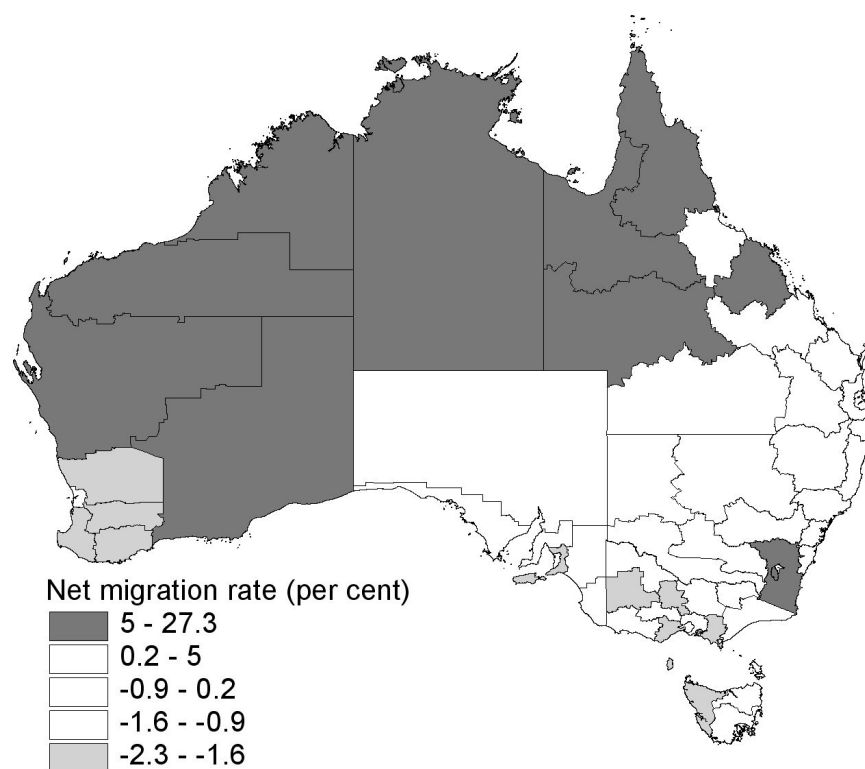
Figure 2: Age-sex profiles of temporary movers 2001, Australia (Source: ABS)



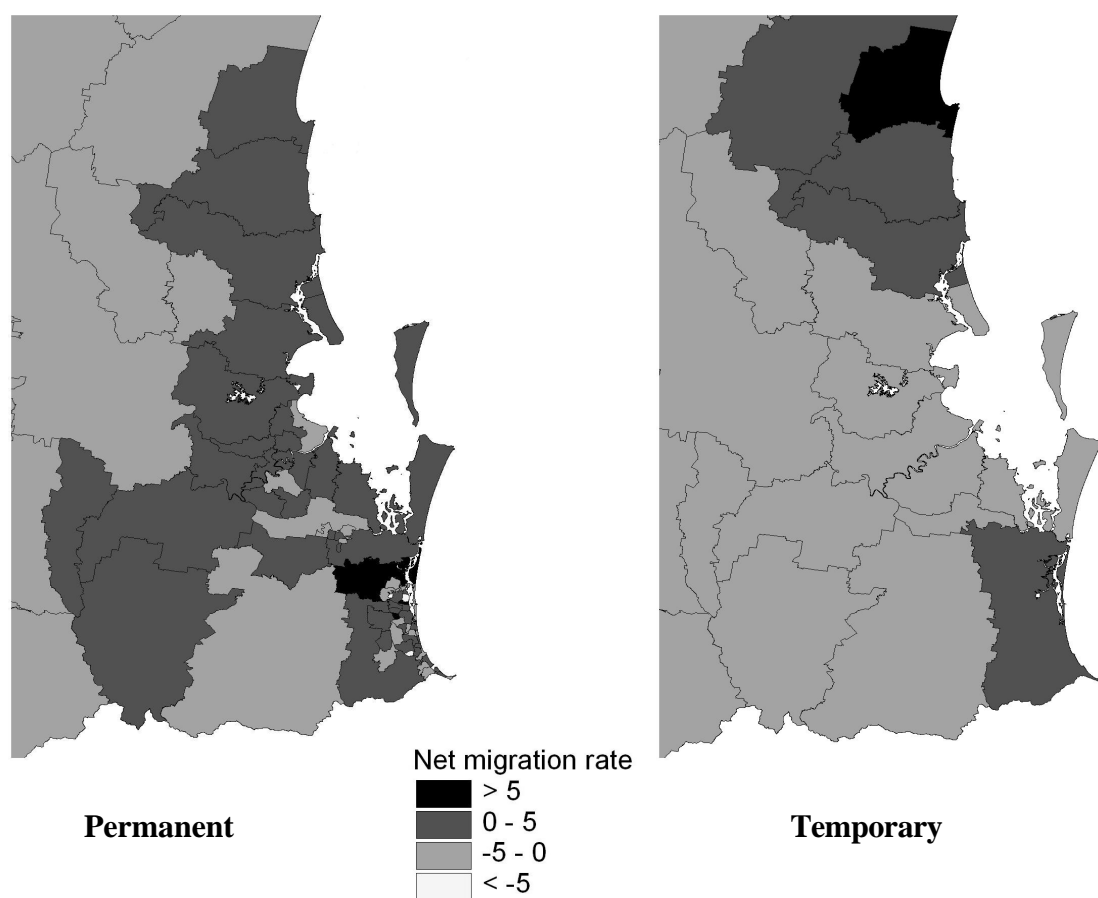
**Figure 3: Statistical Divisions (SDs) and Statistical Local Areas (SLAs) by proportion of movers (Source: ABS)**



**Figure 4: Percent net permanent migration (2000-2001), quintiles, Statistical Divisions of Australia (Source: ABS)**

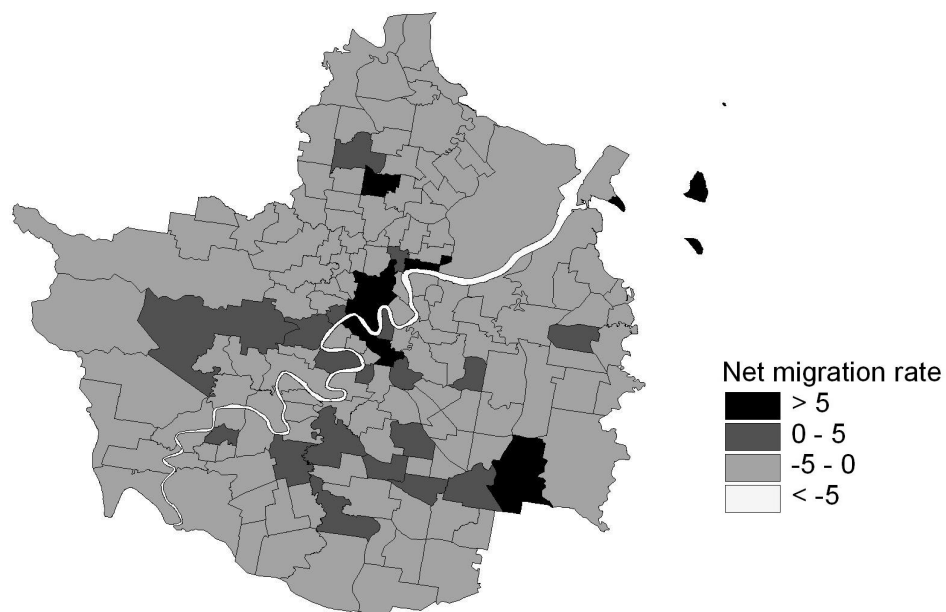


**Figure 5: Percent net temporary migration (2001), quintiles, Statistical Divisions of Australia** (Source: ABS)



**Figure 6: Permanent and Temporary net migration, LGAs and pLGAs, Queensland**

(Source: ABS)



**Figure 7: Temporary net migration, SLAs, Brisbane City LGA (Source: ABS)**