

CHANGING PATTERNS OF POPULATION DISTRIBUTION IN AUSTRALIA

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The spatial dimension of Australia's demography has received limited research attention. This is despite evidence of unprecedented concern among policy makers over perceived wide differentials in wellbeing between different parts of the country. This paper seeks to identify recent and emerging trends in Australia's population distribution, and argues that it is one of the most dynamic and policy-relevant dimensions of the contemporary demographic situation. The paper analyses first the changing distribution of population between the states, then the shifting balance between metropolitan and nonmetropolitan areas. Trends in areas classified according to their degree of remoteness are discussed next, the focus then moving to the changing population distributions within nonmetropolitan Australia and within metropolitan areas. It is argued that there is a growing dichotomization in both nonmetropolitan and metropolitan Australia between areas of growth and areas of decline. Some attention is also given to distributional aspects of social wellbeing.

The spatial dimension of Australia's demography has received limited research attention. This is despite the fact that at the dawn of the new millennium there is unprecedented concern among policy makers over a perceived widening of differentials in wellbeing between different parts of the country: inner versus outer suburbs, urban versus rural areas, coastal versus inland areas, etc. It has been argued that the well-documented social polarization occurring in Australia and other OECD populations (Gregory and Hunter 1995a, b) is increasingly being reflected in greater spatial polarization. This paper seeks to identify recent and emerging trends in Australia's population distribution. It is argued that this is one of the most dynamic and policy-relevant dimensions of the nation's contemporary demography.

Population is too often portrayed as a more or less static backdrop against which social, economic, environmental and political forces are played out. Australia's population is not only growing significantly, but is changing dramatically with respect to its composition and distribution. It is arguably as dynamic as it has been at any time in the postwar period. Between the 1991 and 1996 Censuses, Australia's total population increased by 1.21 per cent per annum. However, the number of households increased by 2.23 per cent, the population aged 65 years and over by

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2.50 per cent, that born in Asia by 4.47 per cent, that aged less than 15 years by only 0.46 per cent. Interstate annual population growth rates currently (1999–2000) vary between 1.7 per cent (Queensland) and –0.1 per cent (Tasmania), while massive differences exist in the direction, scale and components of population change in regions and communities.

This paper takes the approach not so much of predicting the future as of exploring what will happen if demographic trends and tendencies evident in the mid- to late 1990s continue to evolve in the directions they seem to be moving in. No startling predictions are made of major reversals of trends. Instead the emphasis is placed on what seems likely given current trends and patterns in other developed societies. In many respects Australia's current situation is in the middle among OECD nations, and seems to have further to go in some areas, including population distribution. This is not to say that Australia will slavishly follow trends in countries like the United States, as Australia's demography is in many ways unique. Nevertheless, contemporary tendencies in such countries can be helpful in anticipating future trends in Australia.

Interstate population distribution

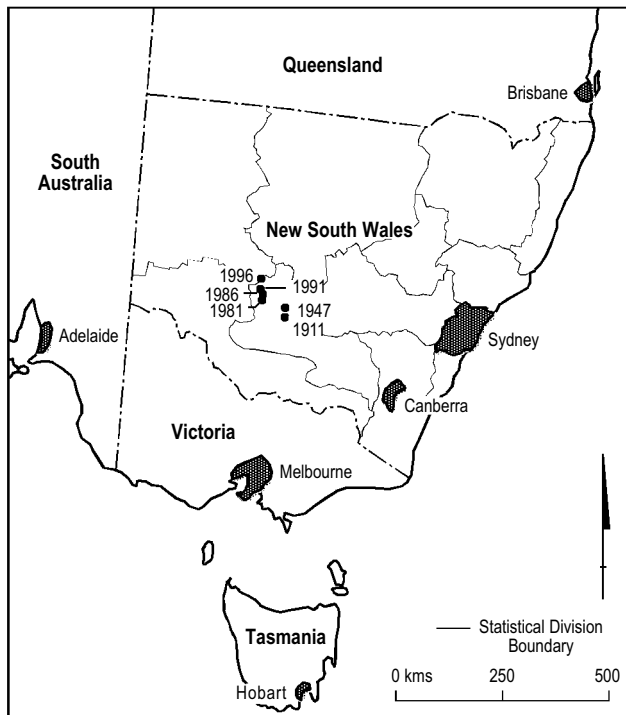
One of the most distinctive spatial shifts to have occurred in Australia's postwar population is that away from the southeastern states to the northern and western parts of the country. In 1947 the states of New South Wales, Victoria, South Australia and Tasmania accounted for 78.4 per cent of the national population, but by 2000 they had only 68.9 per cent of the total. On the other hand, Queensland increased its share from 14.6 to 18.6 per cent and Western Australia from 6.6 to 9.8 per cent. This represents a significant redistribution of population, achieved mainly through interstate migration within Australia. Western Australia has also consistently received more than its proportional share of overseas migrants (Hugo 1996), although Queensland has received a disproportionately low share (Hugo 1990; Jackson 1996). The changing distribution of national population among states (Table 1) shows a consistent pattern over the period 1947–96. New South Wales, Tasmania and Victoria (after a small increase from 27.1 to 27.9 per cent between 1947 and 1961) have regularly lost population share, and Western Australia, the ACT, Northern Territory and Queensland (after a small decline from 14.7 to 14.3 per cent between 1954 and 1971) have regularly gained it. The only change in relative ranking occurred in South Australia, which increased its share from 8.5 to 9.4 per cent between 1947 and 1966 but thereafter consistently lost share to 8.1 per cent in 1996, losing its position as fourth most populous state to Western Australia.

It is interesting, however, to compare changes in overall population distribution patterns in Australia and the United States. Plane and Rogerson (1994) have shown that the period of European occupation of the United States has seen a substantial westward, and smaller southward, shift in the population centroid.¹ Having in 1790 been located in eastern Maryland, there was a symbolic shift between 1970 and 1980 when the centroid crossed the Mississippi River into eastern Missouri. In Australia there has not been such a substantial shift in relative population distribution across the continent. Figure 1 shows shifts in the centre of gravity of the Australian population during the twentieth century. There has been very little change over the bulk of the period since federation – just slight movements to the west and north, reflect-

Table 1 Distribution of population between states and territories, 1881–2000

	1881	1901	1921	1947	1961	1976	1996	2000
New South Wales	33.3	35.9	38.6	39.4	37.3	35.3	33.9	33.7
Victoria	38.3	31.8	28.2	27.1	27.9	26.9	24.9	24.9
Queensland	9.5	13.2	13.9	14.6	14.4	15.2	18.2	18.6
South Australia	12.3	9.5	9.1	8.5	9.2	9.1	8.1	7.8
Western Australia	1.3	4.9	6.1	6.6	7.0	8.4	9.6	9.8
Tasmania	5.1	4.6	3.9	3.4	3.3	2.9	2.6	2.5
Northern Territory	0.2	0.1	0.1	0.1	0.2	0.7	1.0	1.0
Australian Capital Territory	0.0	0.0	0.0	0.2	0.6	1.5	1.7	1.6
Total percentage	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total number (million)	2.2	3.8	5.4	7.6	10.5	13.9	18.3	19.2

Sources: Rowland (1982:25); ABS (2000a).

Figure 1 Shifts in the Australian population centroid, 1911–1996

Source: Australian Censuses, 1911–1996.

ing the fact that population growth rates in Western Australia and, especially, Queensland have exceeded those in the southeast of the country over the last two decades. This demonstrates a pattern of stability in the population distribution, although it is very much a 'dynamic stability' in that substantial, often counteracting, flows of population underpin it. Indeed around 42 per cent of Australians move house in each five-year period, and around 17 per cent move each year (Bell and Hugo 2000). However, the bulk of this movement is compensating, so that net redistribution is limited.

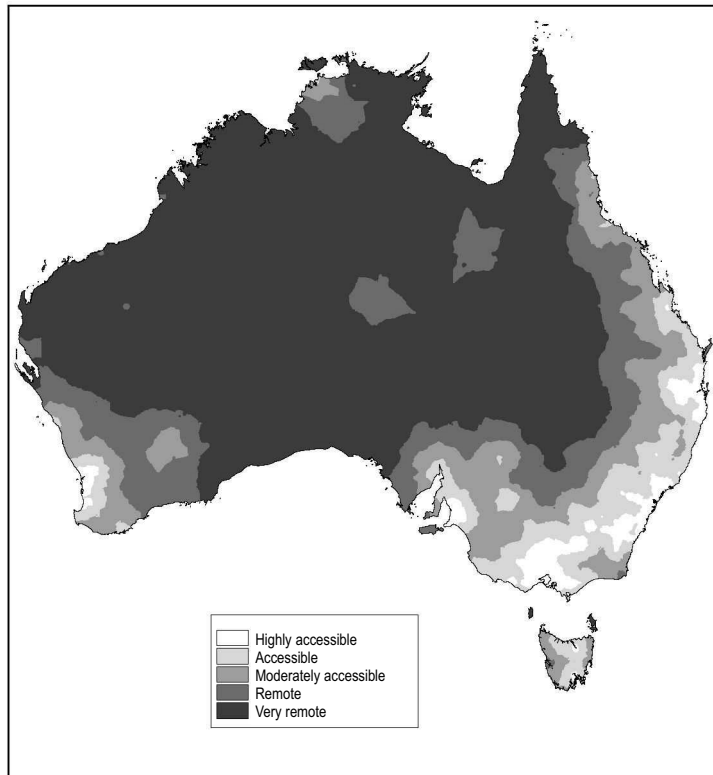
Metropolitan and nonmetropolitan population distribution

An issue of growing political importance in recent years in Australia has been the condition of people living outside the nation's major metropolitan areas. There are a number of important population dimensions of relevance to this issue. One relates to the definition of urban and rural areas in the Australian context. The definitions of urban areas (and rural areas as residuals) have changed little since the mid-1960s, but the nature of Australian settlement patterns has changed enormously. It is argued here that there is a need to rethink the settlement-type categories embodied in the Australian Standard Geographical Classification (ASGC). There has been a substantial blurring of the distinction between urban and rural areas (Hugo *et al.* 1997), and another complication also has arisen. With the burgeoning of interest in regional issues in Australia a great deal of confusion has arisen over who should be included in considerations of 'regional Australia'. Part of the confusion stems from a lack of conceptual clarity. Terms such as 'regional', 'rural' and 'remote' are employed sometimes with specific meanings, and on other occasions more vaguely. Much of the present confusion stems from attempts to combine into a single classification two distinctly different conceptual elements: urban-rural and accessibility-remoteness.

It is argued elsewhere (Hugo and Wilkinson 2000) that these are quite different concepts and need to be treated as such in differentiating types of settlement. Areas can be both urban and remote or rural and accessible. Any attempt to classify non-metropolitan Australia into 'rural' and 'remote' areas is misplaced. Areas should be classified in terms of their urbanness or ruralness and also by their degree of remoteness. The ASGC already has a system for identifying and classifying areas as 'urban' and 'rural', and it needs to be maintained, albeit slightly modified. On the other hand, there is a need for an additional classification by accessibility or remoteness that allows areas outside of the major cities to be classified according to the degree to which services are accessible to them. Such a classification, known as ARIA (Accessibility/Remoteness Index of Australia), has been developed at the National Key Centre for Social Applications of Geographical Information Systems (GISCA) located at the University of Adelaide (Bamford *et al.* 1999).

The definitions employed in this paper can be clearly stated. The term 'non-metropolitan' is used to refer to all parts of the country outside of centres with more than 100,000 inhabitants ('metropolitan' areas). Overlaying this distinction, two types of differentiation are made. First, in accordance with the ASGC, 'Sections of State' are recognized as follows:

1. Major urban – urban areas with populations of 100,000 and over.
2. Other urban – urban areas with populations of 1,000 to 99,999.

Figure 2 Accessibility/remoteness index of Australia, 1996

Source: Glover, Harris and Tennant (1999:9).

3. Bounded rural locality – rural areas with populations of 200 to 999.
4. Rural balance – the remainder of the state or territory.
5. Migratory – offshore areas, ships and migratory Census Collection Districts.

Secondly, the paper also differentiates nonmetropolitan areas according to their degree of remoteness, or of accessibility to services. ARIA indices of remoteness have been calculated for 11,338 localities outside of Australia's major cities, and the entire area of nonmetropolitan Australia has been classified into five categories of remoteness (Figure 2):

1. Highly accessible – locations with relatively unrestricted access to a wide range of goods, services and opportunities for social interaction.
2. Accessible – locations with some restrictions to their access to goods, services and opportunities for social interaction.
3. Moderately accessible – locations with significantly restricted access to goods, services and opportunities for social interaction.
4. Remote – locations with very restricted access to goods, services and opportunities for social interaction.
5. Very remote – locationally disadvantaged – very little access to goods, services and opportunities for social interaction.

Table 2 Distribution of population by settlement size, 1966, 1981, 1991 and 1996

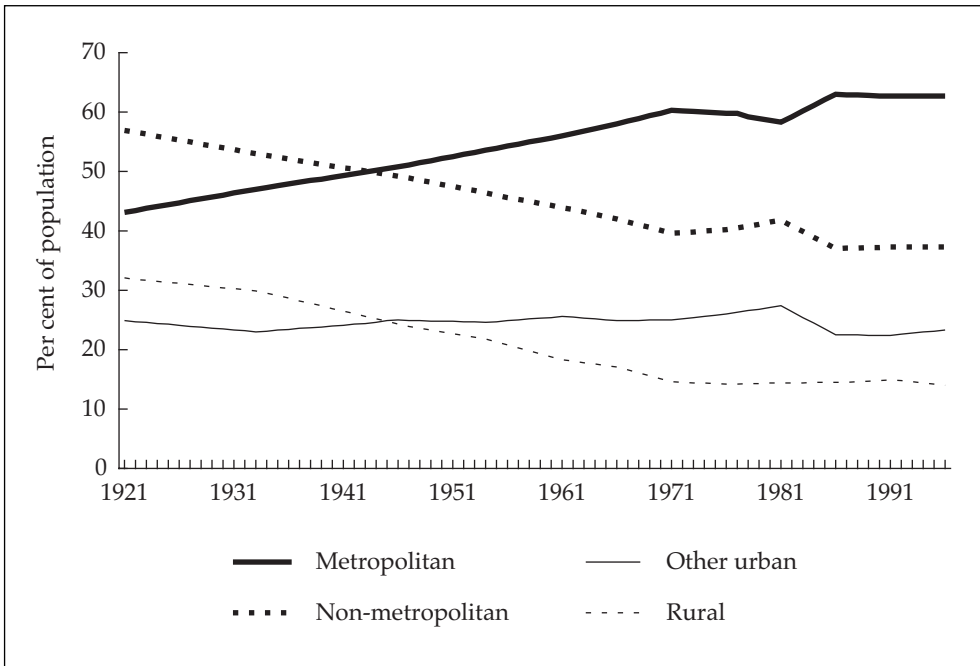
Settlement size	Number of urban centres				Percentage of population			
	1966	1981	1991	1996	1966	1981	1991	1996
500,000 and over	5	5	5	5	56.0	55.5	53.3	53.1
100,000–499,999	4	8	8	8	5.4	8.9	9.1	9.2
75,000–99,999	1	1	1	2	0.8	0.7	0.5	1.0
50,000–74,999	5	9	6	6	2.4	3.8	2.2	2.1
25,000–49,999	5	12	17	25	1.5	3.2	3.3	4.6
20,000–24,999	11	12	22	17	2.1	2.1	2.9	2.1
15,000–19,000	17	21	14	14	2.5	2.9	1.5	1.3
10,000–14,999	19	17	36	37	2.0	1.7	2.5	2.5
5,000–9,999	61	84	89	86	3.8	4.9	3.7	3.5
2,500–4,999	103	122	153	165	3.1	3.3	3.1	3.2
2,000–2,4999	50	59	75	64	1.0	1.0	1.0	0.8
1,000–1,999	178	213	280	312	2.2	2.4	2.3	2.5
Total urban	459	563	706	741	82.9	85.7	85.1	86.0
Total rural					16.9	14.2	14.8	14.0
Total percentage					100.0	100.0	100.0	100.0
Total population ('000)					11,599	14,576	16,851	17,892

Sources: Rowland (1982); Australian Censuses, 1981, 1991 and 1996.

Over the period that the present definition of urban centres has been applied, the number of nonmetropolitan urban places (i.e., 'Other urban' places) has proliferated from 450 in 1966 to 728 in 1996 (Table 2). These country towns have increased their share of the national population from 20.5 per cent in 1966 to 23.7 per cent in 1996. Indeed, if one includes the large provincial centres with between 100,000 and 499,999 inhabitants in this category the increase is even more marked: from 25.9 to 32.9 per cent. It may come as a surprise to some that almost a quarter of Australians live in country towns and regional centres, although some of the former do not lie far beyond city boundaries.

Another perspective is provided by an examination of the 'Section of State' statistics referred to above. Figure 3 shows changes that occurred in the proportions living in metropolitan and nonmetropolitan areas over the twentieth century. The long-term tendency toward increasing concentration of the Australian population is evident. There is a consistent pattern of urban areas increasing their share of the total population up to 1976. At the 1933 Census, 37.4 per cent of Australians lived in rural areas, but by 1961 this proportion had halved and in 1976 only 13.9 per cent of the population was classified as rural. The pattern was, however, not just one of concentration in urban centres, but of a growing dominance of the largest metropolitan centres. Indeed, the nonmetropolitan share of the national population progressively declined in the half-century following 1921, from 57 to 36 per cent, so

Figure 3 Changing distribution of population between urban and rural sectors, 1921–1996

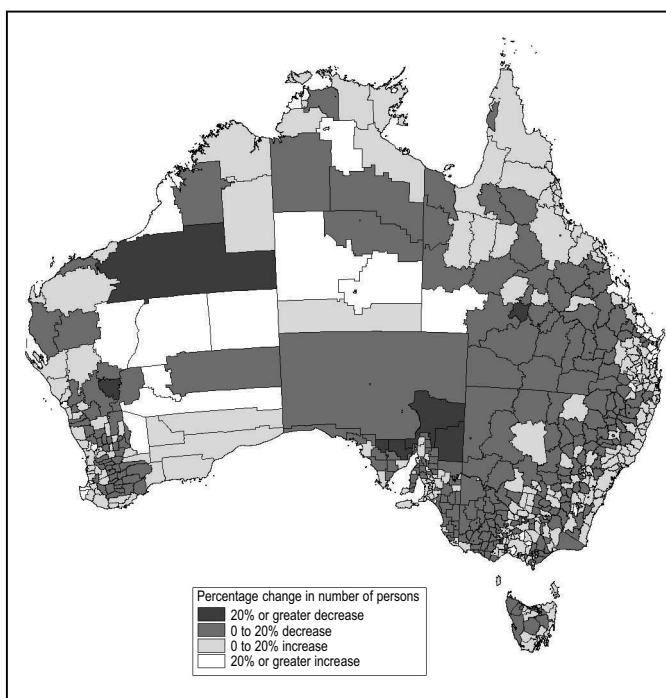


Note: Nonmetropolitan = Other urban + Rural.

Source: Australian Censuses, 1921–1996.

that by 1971 nearly two-thirds of Australians lived in the metropolitan capital cities. Between 1971 and 1976, however, the proportion living in rural areas continued to decline (albeit marginally), but there was also a decline in the metropolitan share of the national population. Hence, in the early 1970s, the only sector to gain ground was that comprising nonmetropolitan urban centres. It is apparent from Figure 3 that subsequently there has been a relative stability in the proportion of Australians living in major urban areas. Indeed there has been a consistent decline in the proportion living in the largest five capitals (Sydney, Melbourne, Brisbane, Perth and Adelaide) since the early 1970s, from 57.9 per cent in 1971 to 53.1 per cent in 1996.

This change, however, has not seen a renaissance of population growth throughout nonmetropolitan Australia. First, while the population living in country towns increased from 2,887,299 in 1966 to 4,161,498 in 1996, a rise of 44.1 per cent, that living in rural areas ('Bounded rural localities' and 'Rural balance') increased by only 25.9 per cent, from 1,983,932 to 2,498,323. More importantly, over the 1991–96 intercensal period there were substantial variations between nonmetropolitan areas in patterns of population change. Figure 4 shows wide regional variations in, and distinct spatial patterns of, population growth and decline. Overall, nonmetropolitan populations grew slightly faster (6 per cent) than did metropolitan populations (5.6 per cent). But population growth in regional Australia was strongly concentrated in certain types of nonmetropolitan areas: areas surrounding metropolitan areas (sug-

Figure 4 Population change, 1991–1996

Source: Australian Censuses, 1991 and 1996.

gesting, perhaps, that slow boundary revision partly explains the decline in the proportion of the population resident in the larger capital cities); along the well watered east and southwest coasts; selected resort and retirement areas; selected regional centres; along the Hume Highway between Sydney and Melbourne; and some relatively remote areas with growing mining or tourist activity, or significant Indigenous populations.

There was also spatial concentration of areas experiencing population decline. Standing out above all others were the dry farming areas of the wheat–sheep belt extending from western Victoria through central–western New South Wales and Queensland, the southeast Eyre Peninsula, the mid-north of South Australia and the wheat–sheep belt of Western Australia. Also experiencing significant decline were many pastoral areas in central Australia, mining areas such as Broken Hill and declining industrial cities such as Whyalla in South Australia. The stark patterns described here and evident in Figure 4 point to substantial population variation within regional Australia.

Population distribution within nonmetropolitan Australia

Table 3 shows 1991–96 rates of population growth for the five accessibility sectors of nonmetropolitan Australia depicted in Figure 2. It indicates that only in the

Table 3 Australian nonmetropolitan areas: population growth by level of accessibility

Level of accessibility	Rate of population growth 1991–96 (%)	Population density (persons per km ²)
Highly accessible	6.2	77.2
Accessible	5.1	4.1
Moderately accessible	3.6	1.0
Remote	1.2	0.2
Very remote	2.9	0.0
Total Australia	5.8	2.3

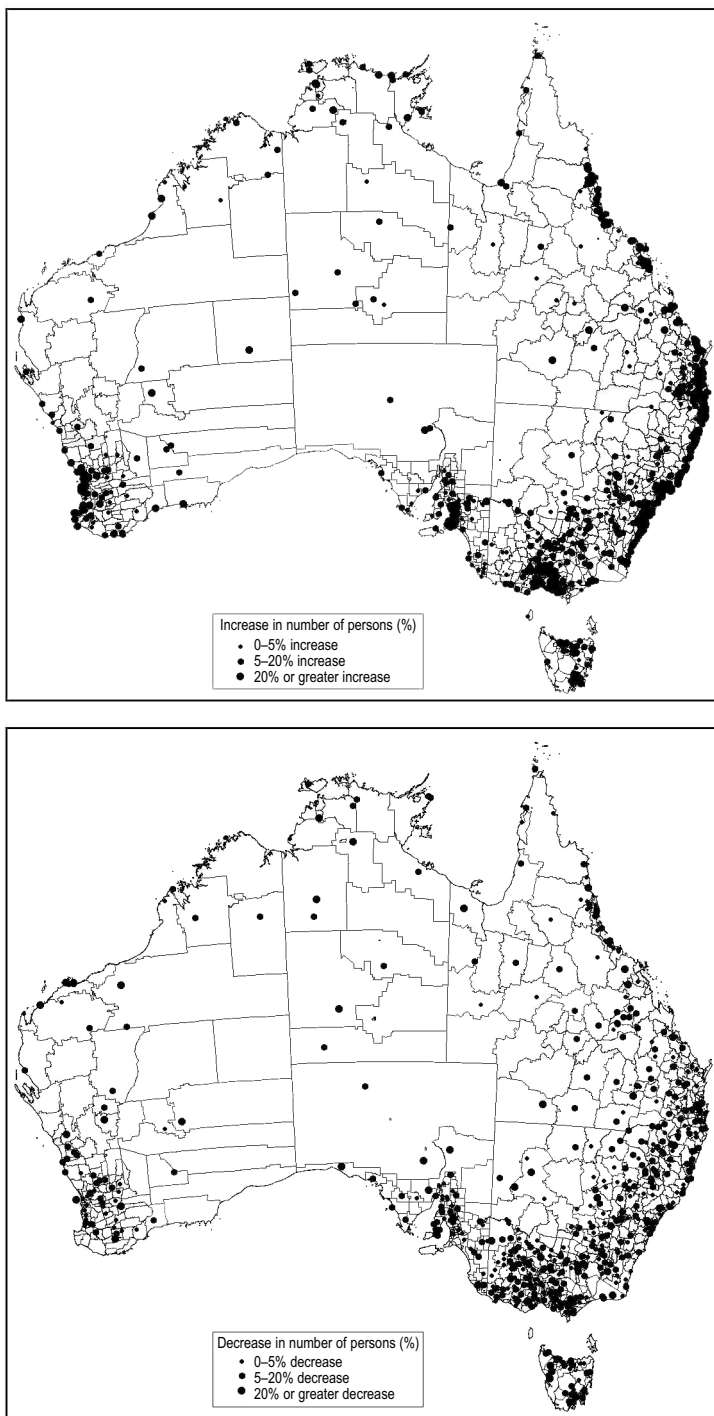
Source: Haberkorn *et al.* (1999:105).

highly accessible areas close to major cities was population growth above the national average. Rates of growth decline with increasing distance away from the large cities, except that 'Very remote' areas had a faster growth rate than 'Remote' areas. It will also be noted that there is an association between rates of population growth and population density.

Turning to population growth trends in country towns, Figure 5 shows the location of towns experiencing growth and decline. Again a clear spatial pattern is evident. Centres with relatively rapid growth are clustered around the nation's largest cities and strung along the eastern and southwestern coasts. On the other hand, wheat–sheep belt towns tend to have experienced decline. In the more remote areas there is greater variation, with some centres recording growth and others decline.

Taken as a group, country towns in Australia are increasing in population more rapidly than either the nation's capitals or the dispersed rural population. Moreover, this is likely to continue over the next decade. However, this growth is far from universal and, in fact, there is an increasing dichotomy between country towns that are growing rapidly and those which are static or declining in population. Indeed, a significant amount of the growth that is occurring is occurring in towns at, and just beyond, the commuting limits around major cities, so that some would argue that it is not so much a counterurbanization trend as a new, diffuse form of urbanization. Certainly the sharp boundaries drawn around the edges of the built-up areas of Australia's major cities by the Australian Bureau of Statistics are becoming less relevant with each passing year. Nevertheless it is clear that not all nonmetropolitan growth is of this type. Nonmetropolitan population change is becoming more diverse and complex. It could be argued that there is a growing and widening dichotomization occurring in nonmetropolitan Australia. The rangelands are generally experiencing rural depopulation, dominated, as in the early postwar years, by school leavers. However, there are substantial areas in the better-watered and more accessible parts of nonmetropolitan Australia that are continuing to experience significant and sustained net in-migration and population growth. The problems faced in these two different types of areas clearly are quite different. Population change in nonmetropolitan Australia is becoming and is likely to become even more diverse, and perhaps much less predictable than in the past.

Figure 5 Population increase and decrease in country towns, 1991–1996



Source: Australian Censuses, 1991 and 1996.

Composition of nonmetropolitan populations

Australia's nonmetropolitan population is becoming more heterogeneous. Increasingly, patterns and trends with respect to many social, demographic and economic variables in the nonmetropolitan sector are mirroring the complexity in large city populations. Importantly, the theme of divergence within nonmetropolitan areas with respect to population growth trends discussed above also applies to the crucial area of the wellbeing of the population. As interest in nonmetropolitan issues in Australia has grown in recent years, much attention has been focused on a perceived gap between the levels of living of people living outside the major cities and city dwellers. Such a focus, though, has diverted attention from significant and ever-widening gaps in wellbeing occurring between areas and groups *within* the nonmetropolitan sector, just as is occurring within Australian cities.

Variations in characteristics of the population within nonmetropolitan Australia are evident in Table 4. The youthfulness of the nonmetropolitan population increases with increasing remoteness while the proportions aged 15–24 are highest at the extremes – in highly accessible and very remote areas. While the aged are overrepresented in the more accessible nonmetropolitan areas, they are heavily underrepresented in remoter areas. It is noticeable, too, that ethnic composition differs between highly accessible and more remote areas. Whereas 15.5 per cent of the population in the most accessible areas was born in a non-English-speaking country, less than a third of that proportion in other areas have such a background. On the other hand, the proportion of the population of Indigenous origin increases with the degree of remoteness, from 1.1 per cent in the most accessible areas to 28.3 per cent in very remote areas. There is little difference between areas in the proportion of families that are single-parent families, except that this proportion is higher in very remote areas. There are sharp education differentials between highly accessible and more remote areas. Interestingly, proportions of the workforce engaged in

Table 4 Australia: selected population indicators according to remoteness category, 1996

Indicator	Highly accessible	Accessible	Moderately accessible	Remote Australia	Very remote	Total Australia
% aged 0–14	21.1	23.5	23.8	24.8	25.0	21.6
% aged 15–24	14.9	12.6	11.9	12.7	14.9	14.5
% aged 65+	12.1	12.9	12.4	8.5	6.9	12.1
% born overseas (NES)	15.5	4.3	3.9	4.3	4.2	13.3
% indigenous	1.1	3.2	4.7	9.3	28.3	2.0
% single-parent families	9.9	9.8	8.5	9.0	12.8	9.9
% aged 16 in education	81.9	75.5	74.0	67.3	46.5	80.2
% with bachelors degrees	11.4	6.4	5.4	6.4	6.6	10.4
% employed in agriculture	1.6	12.1	21.5	19.6	9.0	4.0
% unemployed	9.1	10.5	8.7	7.5	6.3	9.2
% in public rental housing	4.8	5.4	3.6	7.1	8.0	4.9

Source: Haberkorn *et al.* (1999:105–106).

agriculture are highest in the moderately accessible and remote areas, but still account for only a fifth of workers in those areas. Unemployment is highest in the accessible areas and lowest in remote areas, while public rental housing is most common in the remoter areas where Indigenous public housing is important.

Population distribution within cities

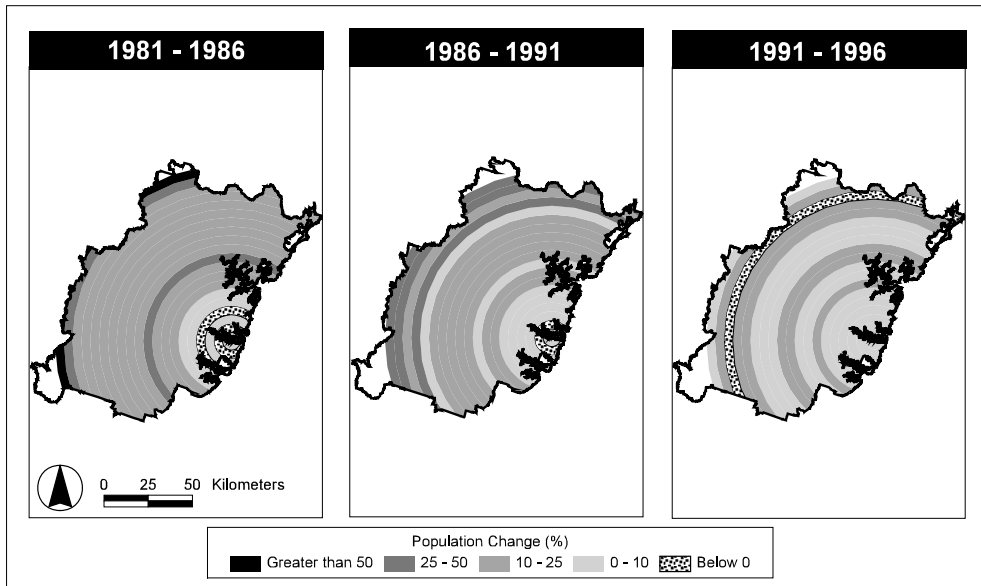
Australia's major metropolitan areas (cities with 100,000 or more inhabitants) were home to 62.7 per cent of Australians in 1996. They remain the main areas of population growth in the nation, and demographics play an important part in projecting shifts in demand for goods and services within them. While it is a generalization, the main pattern of population change in the postwar years, at least until the 1980s, was the classical 'doughnut' pattern, with population decline in inner and inner-middle suburbs grading to moderate population growth in the middle suburbs and rapid growth on the urban fringe.

While elements of this pattern are still evident, the 1996 Census series of Social Atlases of population change in Australia's major cities between 1991 and 1996 shows a different one. Certainly areas of population growth continue to be found on the expanding urban fringes, but there was also growth in several inner suburbs and in a scattering of older inner-middle and middle suburbs, especially along main transport routes and in coastal areas. The new trends are especially evident if population growth is examined at the Census Collection District level within Australian cities. The map of population change at this level in Adelaide during 1991–96, for example, shows that although areas of growth are still evident on the city's periphery, there were also many areas of growth within the older built-up area (ABS 1997).

These patterns reflect a significant and growing movement of people into inner and middle areas of Australian cities. There are several elements to this trend. First, gentrification, which has seen well-to-do, often two-income couples move into attractive older housing areas in these inner and middle suburbs. This has been associated with changed lifestyle preferences for living near the city centre. Second, urban consolidation activities of state, local and city governments, which have seen land in established suburbs, formerly occupied by factories, schools and other extensive uses, developed for medium-density housing. Third, the ageing of the massive cohort that moved into new housing in the 1950s and 1960s. Many have died or moved into specialized elderly accommodation, causing unprecedented numbers of houses in the middle suburbs to come on to the housing market. This has enabled younger people to move in as individual or groups of house blocks are redeveloped. Finally, it may be that the large Baby Boom cohort is behaving differently to earlier generations of empty nesters in their late 40s and early 50s. Whereas these earlier generations tended to stay in the suburban family home after 'launching' their children, there are signs that many Baby Boomers are trading down to smaller, more centrally located houses.

A more detailed analysis of trends can be made by comparing population change in concentric rings around the central business districts of cities. Figure 6 shows the pattern for Sydney. It is one of almost universal population growth, indicating that both reurbanization and suburbanization have been occurring on a significant scale in Australia's largest city. Central rings of population decline during

Figure 6 Sydney urban and peri-urban area: population change by distance from the CBD (5 km rings)



Source: Australian Censuses, 1981–1996.

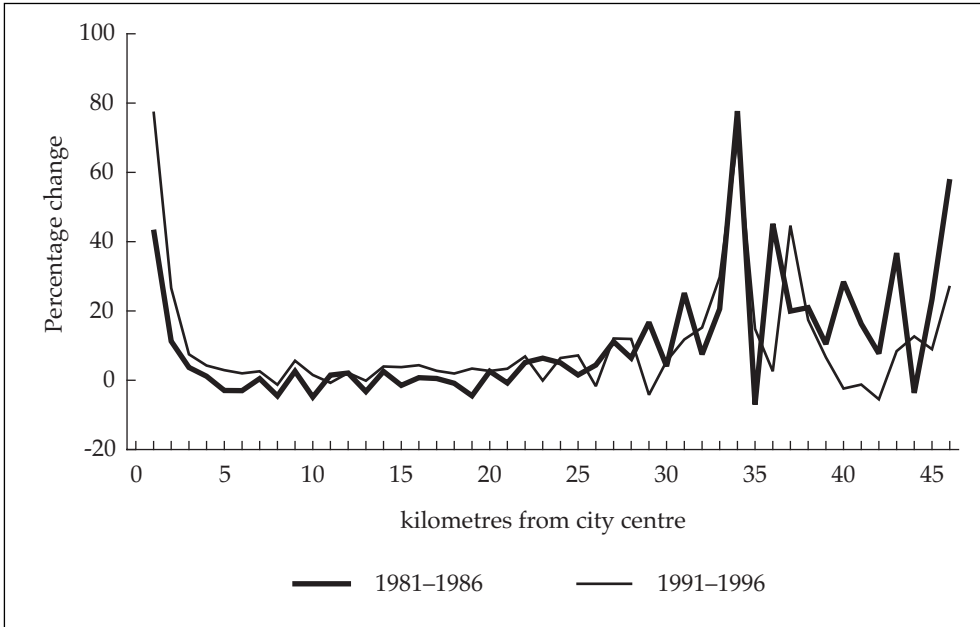
1981–86 had disappeared by 1991–96, indicating that urban consolidation activities have been successful in increasing population numbers in inner and middle suburbs.

Evidence regarding the reurbanization versus suburbanization of Sydney can be obtained by comparing rates of population growth during 1981–86 and 1991–96 in concentric rings around the city (Figure 7). It can be seen that the reurbanization process was already in evidence during 1981–86, when the inner-city rings had significantly faster rates of population growth than the middle suburbs, although the fastest rates were on the periphery. During 1991–96 there were faster rates of population growth in most rings within 20 kilometres of the city centre than 10 years earlier. However, it is noticeable that while rings on the periphery grew faster than middle rings, they generally grew at rates *lower* than 10 years earlier. Indeed, the fastest growing ring in the city was the innermost ring. The evidence here, then, is of important reurbanization, although suburbanization is still occurring, albeit more slowly than previously. Figure 7 suggests that while suburbanization is still very important in Sydney (and may extend beyond the maximum radius shown), infilling of the existing urban structure has increased in significance.

The change that has occurred can be underlined. Figure 8 shows patterns of population growth in concentric rings around the centres of Australia's major cities during 1971–76. While the methodology it adopts is different from that used to produce Figure 7, it is obvious that in the early 1970s a clear pattern of inner-city population decline and outer-city population growth prevailed.

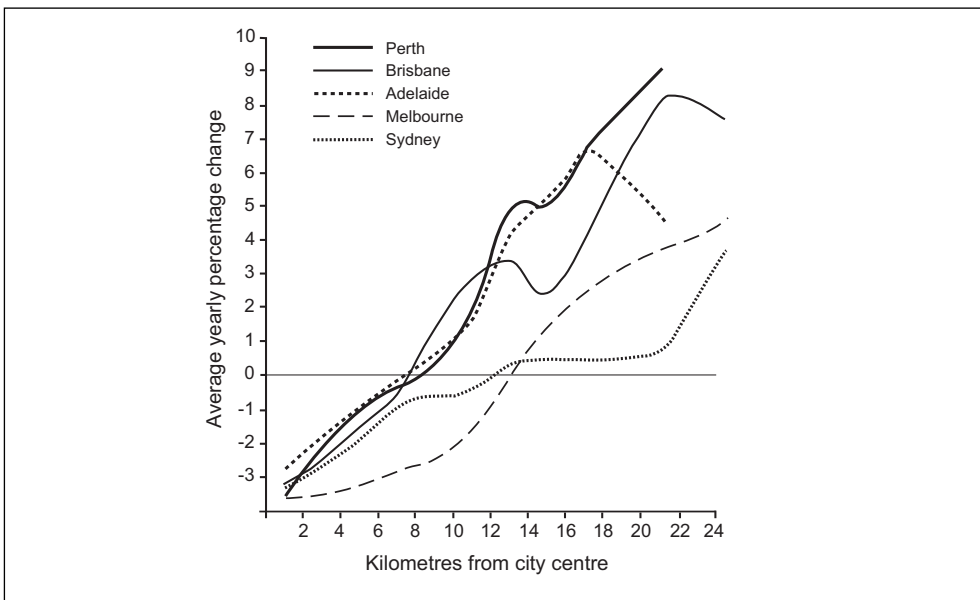
Figure 9 shows the Melbourne equivalent of Figure 7 for Sydney, and a clear

Figure 7 Sydney: rates of population change by distance from city centre

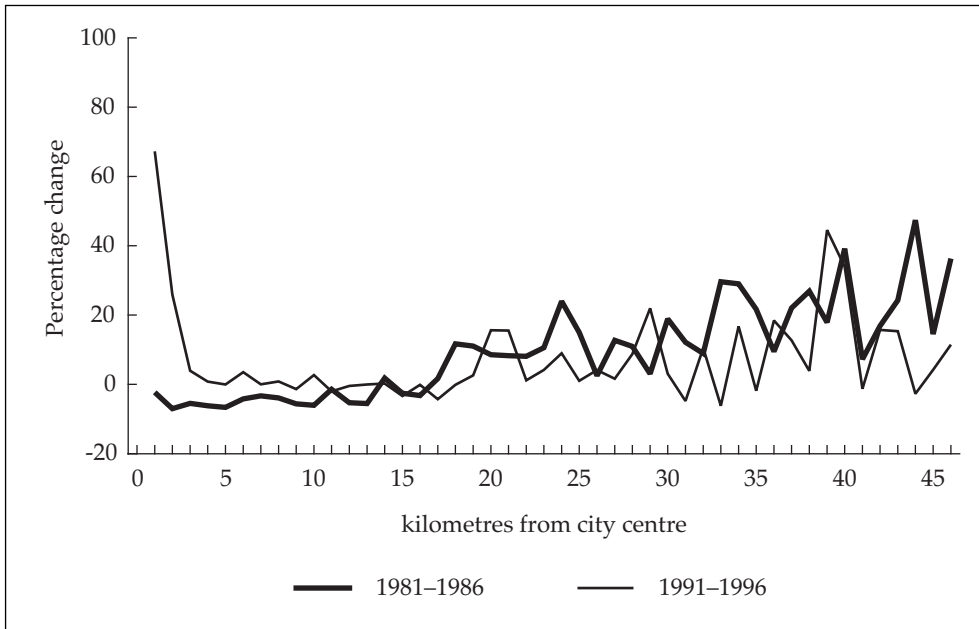


Source: Australian Censuses, 1981-1996.

Figure 8 Rates of population change by distance from city centre in largest five cities, 1971-1976



Source: Division of National Mapping (1980).

Figure 9 Melbourne: rates of population change by distance from city centre

Source: Australian Censuses, 1981-1996.

change is again evident between patterns of population growth during 1981-86 and 1991-96. Again the highest rates of growth during 1991-96 are in the innermost concentric rings. This compares with a pattern of inner-city population decline during 1981-86, when there was a clear tendency toward increasing rates of growth moving outward from the city centre. During 1991-96 some of the highest rates of growth in Melbourne were lower than equivalent rates during 1981-86. Again, comparison with the 1971-76 pattern confirms that change has occurred. This does not mean that suburbanization is no longer significant in Melbourne. Rather, both types of population growth are occurring there. Intra-urban migration patterns in Australia's major cities have become more complex, and less dominated by net outflows from city centres to peripheries.

Trends described in this section almost certainly will continue and become more evident in the next decade or so, when large areas of the middle suburbs developed in the 1950s and 1960s will come on to the property market. This will raise opportunities for housing development in established areas to unprecedented levels, and consequently reduce pressure on the fringes of major cities. While to some extent suburbs have had a degree of age homogeneity about them in the past, they are now more diverse, and will become increasingly so in the future. This, of course, will make small-area population projection in cities more problematic than ever, but does raise the possibility of less dramatic swings in demand for age-specific suburban services like schools than has been typical since the Second World War.

In addition to noting increased activity in the inner and middle suburbs of Australian cities, there is a need to focus attention on the areas around the largest

cities. There has long been recognized a distinctive zone around large cities in more developed countries. It is decidedly rural or nonmetropolitan in appearance, but contains many functions that are strongly associated with the metropolitan area, and its residents maintain strong regular (often daily) contact with that area (Spectorsky 1958; Friedmann and Miller 1965; Pahl 1965). This zone is distinctive in function and population composition, but is also seen by some as being transitional between the metropolitan and nonmetropolitan areas, while others see it as part of the metropolitan region because of its strong functional linkages with the city proper. This region has been variously referred to as 'ex-urban' (Davis 1990; McKenzie 1996), 'peri-metropolitan' (Burnley and Murphy 1995), 'technoburbs' (Fishman 1990) and 'exurbia' (Nelson and Dueker 1990). Burnley and Murphy (1995) have described such areas as comprising urban centres set in a matrix of rural land, where traditional agricultural and associated service functions have been invaded by uses associated with the nearby metropolitan area, including the development of low-density residential areas for commuters and retirees. In the United States this has been recognized as a new settlement form, housing some 60 million people, or a quarter of the total population (Nelson and Dueker 1990). There the term 'rural-residential' has been used to describe new housing developments of varying densities for people predominantly commuting to a metropolitan area (but not necessarily the CBD or inner city), with some having hobby farms and others residential allotments only. Hence it is a distinctive landscape, with particular land use and planning issues and problems often arising from clashes of urban and rural functions and values.

In Australia, Burnley and Murphy (1995) have argued that ex-urban areas are not as well developed as they are in the United States because of the stronger planning system in Australia. Nevertheless, increasing attention is being focused on them. Maher and Stimson (1994) and McKenzie (1996), for example, have shown that they are the fastest-growing regions in the nation in terms of expansion of population. O'Connor and Stimson (1996) show that they are attracting increasing shares not only of dwelling construction investment but also of investment in commercial construction. Undoubtedly these areas will increase in significance as a distinctive and important type of settlement in Australia over the next twenty years, and it is important to develop appropriate methods of delimiting them. It has been suggested that journey to work data might be utilized to do this (Hugo *et al.* 1997).

Social polarization

Population scientists in Australia have tended to afford issues of social class limited attention in examining demographic trends and issues. It can be argued that such considerations should be high on their research agenda for the next few years. There is a need to examine the impacts of socio-economic shifts on demographic processes, as well as relationships in the opposite direction. One area of particular interest is growing evidence of social polarization in both Australia and other OECD countries. Smeeding and Gottschalk (1995:24–25), for example, in discussing a wide variety of trends in income inequality, note that

the most distinctive changes in income distribution in modern OECD nations seem to have taken place in the United Kingdom and in the United States, where there has been

a hollowing out of the middle of the distribution marked by an increasing fraction of the population both in upper and lower income groups relative to overall median income.

In the Australian context, Harding (2000:13) has pointed out:

From 1982 to 1996–97, the average income of the most affluent 10 percent of Australians increased by almost \$200 per week. This was three to six times more than those at the bottom of the income distribution. So although on average everyone was better off, the gap between middle Australians and those at the top widened.

Of particular interest to population scientists is the likelihood that this social polarization has an important spatial dimension. Indeed, it has been suggested that there is an increasing spatial separation of rich and poor in Australian cities (Gregory 1993; Gregory and Hunter 1995a, b). Harding (2000:13) found that

household incomes in the five most affluent postcodes in Victoria rose by almost 20 percent from 1986 to 1996 while those in the five poorest Victorian postcodes fell by 10 percent. An income chasm is growing between the inner metropolitan cities and those living in the outer metropolitan areas. The gap is also increasing between those living within and outside cities, while South Australia and Tasmania lag far behind other states.

The Australian Bureau of Statistics (2000b) has calculated an index of relative socio-economic disadvantage (SEIFA) for all census Collection Districts (CDs) in Australia and cross-tabulated it against Section of State on the one hand and ARIA score on the other. These tables indicate some interesting spatial dimensions of social disadvantage in Australia. Table 5 distributes the population living in the bottom 20 per cent of CDs according to the SEIFA index, and total population, by Section of State. Clearly there are overconcentrations of population living in the poorest CDs in 'Other urban' places (1,000–99,999 inhabitants) and 'Rural localities' (200–999 inhabitants). Table 6 then shows that the population living in the poorest CDs is significantly underrepresented in highly accessible areas and overrepresented in less accessible areas. Hence there are clear differences between settlement categories in the incidence of poverty. A more detailed analysis of these differences has been undertaken by Posselt (2000).

Gregory and Hunter (1995a, b) have demonstrated an increasingly strong spatial divide between poor and rich areas within Australian cities. A similar divide may well exist or be developing in nonmetropolitan areas as well. An increasingly important factor in spatial social polarization is migration. Hugo and Bell (1998) have shown that there is a strong economic selectivity factor operating in internal migration between metropolitan and nonmetropolitan areas in Australia. In-migration to large urban areas is selective of high-income groups, and indeed there are net gains of high-income groups in these cities but net losses of low-income groups. On the other hand there are net gains of low-income groups in nonmetropolitan areas, due to substantial flows of such groups from metropolitan areas.

Conclusion

With respect to the future, one can note that Australia has experienced less decentralization of its national population away from its major cities (Sydney and Melbourne) and their immediate hinterlands than has occurred in many developed

Table 5 Percentages of total national population and of population in the lowest 20 per cent of Collection Districts by SEIFA in each Section of State category

Section of State	Total population (%)	Population in lowest 20% of Collection Districts (%)
Major urban	62.7	55.7
Other urban	23.3	33.8
Rural locality	2.5	5.1
Rural balance	11.5	5.4
Total	100.0	100.0

Source: ABS (2000b).

countries. While Australia need not necessarily follow overseas trends, this suggests the possibility that there could be greater overall change in population distribution in Australia over coming decades than in the past. Considerations that might promote this include the following. First, the continued development of information technology, which will tie people and industry less to locations in major urban areas than in the past. Second, the ongoing shift in employment from manufacturing and agriculture towards service industries. Third, increasing differentials in the costs of housing, land and infrastructure between different parts of Australia. And finally, growing evidence of environmental stress in heavily populated areas such as Sydney. These developments may result in locations that have been seen as peripheral, such as Adelaide, being better able to compete for people and companies with larger, more centrally located cities, although the latter will continue to attract population – for example, as likely preferred destinations for immigrants and through labour demand created by the ageing of the Baby Boom generation.

Table 6 Percentages of total national population and of population in the lowest 20 per cent of Collection Districts by SEIFA in each ARIA class

ARIA Class	Total population (%)	Population in lowest 20% of Collection Districts (%)
Highly accessible	81.8	74.7
Accessible	11.8	16.5
Moderately accessible	4.0	4.6
Remote/very remote	2.4	4.2
Total	100.0	100.0

Source: ABS (2000b).

Griffith Taylor (1947:44), writing over half a century ago, contended that Australia's future population distribution would see the population concentrated in the areas settled by 1860, and in many ways he has been proved correct. However, while the fundamental pattern of settlement of the continent has remained the same, there have been, as has been demonstrated, some important changes in the details of the distribution, and such adjustments can be expected to continue to occur.

There is considerable debate about Australia's future population. There have been a number of inquiries by government and agencies such as the Academy of Science concerning a future sustainable population for Australia. Some discussions have centred on an 'optimum' population, but this begs the issue of optimum for whom? There are vocal lobbies advocating demographic dynamics that would lead to substantial population decline and rapid ageing of the population on the one hand, and unrealistic scenarios envisaging a rapid doubling of the population on the other. McDonald and Kippen (1999) have shown that a scenario of continued moderate growth of the population toward stabilization at around 24 million in 50 years time would produce an age structure with an acceptable balance between persons of working and nonworking age. This scenario assumes continued net migration gains at current levels of around 80,000–100,000 per annum and maintenance of fertility at around 1.65–1.7 births per woman. This appears the most likely scenario for future population growth in Australia. However, it must be remembered that the population will not only change in terms of its growth. Indeed, changes in its composition (by age, household composition, ethnicity, etc.) and spatial distribution are likely to be more dramatic than that in its size. These dynamics present a number of both challenges and opportunities to the private and public sectors, so that it is important to identify and monitor the likely changes. Anticipating future trends is risky, but careful analysis of recent and emerging population trends can provide many useful insights into the future.

In Australia, public debate about population focuses almost entirely on future population size and the role of immigration in producing it. While such debate is vital, this paper has shown that the population is also changing in many ways that are little affected or only indirectly affected by immigration. It is not just with respect to size and growth that Australia's population is changing, and likely to continue to change. Substantial shifts of some momentum are also occurring in its composition and spatial distribution. One important theme is that of increasing diversity. This is evident in household structures, in ethnic composition and in spatial population growth patterns. Moreover, while in the aggregate the characteristics of Australians living in metropolitan and nonmetropolitan areas are converging, there is also evidence of an increasing dichotomy between well-off and not-so-well-off areas and groups within cities and within nonmetropolitan areas.

There are significant data-collection issues that relate to this. In particular, there is a need for more small-area analysis of population change in Australia. This is necessary if the twin trends of increasing diversity and complexity on the one hand, and increased divergence and inequality on the other, are to be understood. Australia has been a global pioneer in the development of small-area population statistics, but it is necessary for the next step to be taken. Developments in spatial information systems technology and methodology have made small-area population analysis more feasible than ever before, and it is vital that consideration be

given to making some population data available at a smaller geographical scale than the Census Collection District. This ideally would include geocoding of individual information. Privacy considerations are crucial here, but well-established methods of protecting privacy while also georeferencing data exist. Failing this, limited population information needs to be made available for areas smaller than Census Collection Districts. It is necessary to be able to fit population data to meaningful socially, environmentally and economically defined areas in order for them to be optimally useful in planning, and relevant to social, economic and environmental research. Reconsideration of the geographical basis of Australian population data should extend to modification of the Australian Standard Geographical Classification (ASGC) as suggested earlier. This is necessary to facilitate study and understanding of the myriad changes occurring in the distribution of Australia's population, and more importantly their implications for population wellbeing.

Note

1. Plane and Rogerson (1994:31) explain this as follows: 'The *population centroid*, also called the *mean centre*, the *mean point*, the *centre of gravity*, or sometimes simply the *centre of population*. Conceptually, if the mythological Atlas were to hold up the entire area for which a centre is being computed – let's say the United States – and assuming that people were the only objects contributing to the weight (and also assuming everyone weighs the same!), the point where he would have to stand to balance the country would be the centroid.'

References

- Australian Bureau of Statistics (ABS). 1997. *Adelaide, A Social Atlas*. Catalogue No. 2030.4. Canberra.
- Australian Bureau of Statistics (ABS). 2000a. *Australian Demographic Statistics June Quarter 2000*. Catalogue No. 3101.0. Canberra.
- Australian Bureau of Statistics (ABS). 2000b. *Australian Social Trends 2000*. Catalogue No. 4102.0. Canberra.
- Bamford, E.J., L. Dunne, G.J. Hugo, D.S. Taylor, B.G. Symon and D. Wilkinson. 1999. Accessibility to general practitioners in rural South Australia. *Medical Journal of Australia* 171(11/12):614–616.
- Bell, M. and G.J. Hugo. 2000. *Internal Migration in Australia 1991–1996, Overview and the Australia-born*. Canberra: Australian Government Publishing Service.
- Burnley, I. H. and P.A. Murphy. 1995. Ex-urban development in Australia and the United States: through a glass darkly. *Journal of Planning Education and Research* 14:245–254.
- Davis, J.S. 1990. Ex-urban community patterns: a case study of the Portland, Oregon region. PhD dissertation. Oregon State University, Corvallis, Ore.
- Division of National Mapping. 1980. *Atlas of Australian Resources Volume 2: Population*. Third Series. Canberra.
- Fishman, R. 1990. Megalopolis unbound. *Wilson Quarterly* 14:25–48.
- Friedmann, J. and J. Miller. 1965. The urban field, H.W. *American Institute of Planning Journal* 31(4):312–319.
- Glover, J., K. Harris and S. Tennant. 1999. *A Social Health Atlas of Australia*. Second Edition. Canberra: Open Book Publishers.
- Gregory, R.G. 1993. Aspects of Australian living standards: the disappointing decades 1970–90. *Economic Record* 69:61–76.

- Gregory, R.G. and B. Hunter. 1995a. The macro-economy and the growth of ghettos and urban poverty in Australia, The National Press Club Telecom Address. Discussion Paper No. 325, Centre for Economic Policy Research, Australian National University.
- Gregory, R.G. and B. Hunter. 1995b. Further remarks on increased neighbourhood inequality. *Social Security Journal* June:20–28.
- Haberkorn, G., G. Hugo, M. Fisher and R. Aylward. 1999. *Country Matters: Social Atlas of Rural and Regional Australia*. Canberra: Bureau of Rural Sciences.
- Harding, A. 2000. Swill time for those at the top. *Australian* 21 June:13.
- Hugo, G.J. 1990. *Atlas of the Australian People – Queensland, 1986 Census*. Canberra: Australian Government Publishing Service.
- Hugo, G. J. 1996. *Atlas of the Australian People – 1991 Census, Western Australia*. Canberra: Australian Government Publishing Service.
- Hugo, G.J. and M. Bell. 1998. The hypothesis of welfare-led migration to rural areas: the Australian case. Pp. 107–133 in P. Boyle and K. Halfacre (eds), *Migration into Rural Areas – Theories and Issues*. West Sussex: John Wiley and Sons.
- Hugo, G.J., D. Griffith, P. Rees, P. Smailes, B. Badcock and R. Stimson. 1997. *Rethinking the ASGC: Some Conceptual and Practical Issues*. Final report for Review of the ASGC Project, National Key Centre for Teaching and Research in Social Applications of Geographical Information Systems, University of Adelaide.
- Hugo, G.J. and D. Wilkinson. 2000. Rural, remote or regional? Definition, measurement, meaning and classification in Australia: conceptual issues. Unpublished mimeo.
- Jackson, R.T. 1996. *Atlas of the Australian People – 1991 Census, Queensland*. Canberra: Australian Government Publishing Service.
- Maher, C.A. and R.J. Stimson. 1994. *Regional Population Growth in Australia*. Canberra: Australian Government Publishing Service.
- McDonald, P. and R. Kippen. 1999. Population futures for Australia: the policy alternatives. Paper presented to Vital Issues Seminar, Canberra, 31 March.
- McKenzie, F. 1996. *Beyond the Suburbs: Population Change in the Major Ex-Urban Regions of Australia*. Canberra: Australian Government Publishing Service.
- Nelson, A.C. and J. Dueker. 1990. The ex-urbanisation of America and its planning policy implications. *Journal of Planning Education and Research* 9:91–100.
- O'Connor, K. and R.J. Stimson. 1996. Convergence and divergence of demographic and economic trends. Pp.108–125 in P.W. Newton and M. Bell (eds), *Population Shift: Mobility and Change in Australia*. Canberra: Australian Government Publishing Service.
- Pahl, R.E. 1965. *Urbs in Rure: The Metropolitan Fringe in Hertfordshire*. Geographical Papers No. 2, London School of Economics and Political Science.
- Plane, D.A. and P.A. Rogerson. 1994. *The Geographical Analysis of Population: With Applications to Planning and Business*. New York: John Wiley.
- Posselt, H. 2000. Identifying social disadvantage in rural and remote Australia. Paper presented at Australian Population Association 10th Biennial Conference, Melbourne.
- Rowland, D.T. 1982. Population growth and distribution. Pp. 10–45 in ESCAP, *Population of Australia*, Volume 1, Country Monograph Series No. 9. New York: United Nations.
- Smeeding, T.M. and P. Gottschalk. 1995. *The International Evidence on Income Distribution in Modern Economies: Where Do We Stand?* Working Paper No. 137, Luxembourg Income Study. Luxembourg: CEPS/INSTEAD.
- Spectorsky, A.C. 1958. *The Exurbanites*. Philadelphia: J. B. Lippincott.
- Taylor, T.G. 1947. *Australia: A Study of Warm Environments and Their Effect on British Settlement*. London: Methuen.