Session Number: Session 8B

Time: Friday, August 29, PM

Paper Prepared for the 30th General Conference of

The International Association for Research in Income and Wealth

Portoroz, Slovenia, August 24-30, 2008

Has the Risk of Social Exclusion for Australian Children Become More Geographically Concentrated? : Patterns From 2001 to 2006

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Abstract

This paper compares small area estimates of the risk of social exclusion for Australian children aged 0 – 15 based on data from the 2001 and 2006 Censuses of Population and Housing conducted by the Australian Bureau of Statistics (ABS). Patterns of change (both positive and negative) are analysed, and changes in the characteristics of the areas where children have remained at high risk of social exclusion are studied. The paper extends earlier work which focussed on 2001 data only. We find an overall tendency for child social exclusion risk to persist in small areas over time, although we also found some tentative support for a possible narrowing of the risk gap between the highest risk and lowest risk areas across the five year period. Children living outside the capital cities were at higher risk of social exclusion than those in capital cities across both periods, although most capital cities nevertheless contain areas of high risk in both 2001 and 2006.

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Acknowledgments

This study has been funded by a Discovery Grant from the Australian Research Council (DP 560192). The authors would like to thank Mandy Yap for her contribution to earlier work on this project.

1 Introduction

The election of the Australian Labor Party to government in November 2007, with a commitment to improving social inclusion and reducing social exclusion, has transformed public discussion on this topic in Australia by promoting a debate on the position of disadvantaged groups in a growing and prosperous society (ALP 2007). Several of the state governments, including South Australia and Victoria, have already developed a series of social indicators for measuring outcomes. However, now the Commonwealth government is committed to developing these at a national level and to pursing policies to promote social inclusion (see ACOSS 2008 for a survey of potential target indicators). This paper aims to contribute to this debate.

The aims of this paper are to compare small area estimates of the risk of social exclusion for Australian children, based on data from the 2001 and 2006 Censuses of Population and Housing conducted by the Australian Bureau of Statistics (ABS); to identify the areas that have improved or deteriorated as measured by the index; and to highlight the characteristics of the areas where children have remained at high risk of social exclusion. Evidence is presented for a summarising index of risk of social exclusion for children and individual indicators are also considered.[1] This focus on children and a broader measure of disadvantage than just income poverty can be justified on a number of grounds.

In most countries, including Australia, children are over-represented among the poor and disadvantaged. Poverty rates for all Australians and for children under 15 years of age were estimated using the first three waves of the Household Incomes and Labour Dynamics in Australia (HILDA) survey, for 2000-01, 2001-02, and 2002-03 (Headey and Wooden 2005; Headey et al 2005). They define poverty as living in a household where the disposable equivalent household income was less than half the median income.[2] They estimate that the poverty rate among children under 15 years of age fell from 15.3 per cent in the first wave to 13.2 per cent in the third wave of HILDA. This contrasted with a fall in poverty rates for the population as a whole from 14.2 per cent to 12.1. A recent study of child poverty rates in the twenty-seven EU countries, based on 2005 data, shows that in all countries except the Nordic countries, Cyprus, Greece and Slovenia, children were at greater risk of living in poverty than the population as a whole (Frazer and Marlier 2007).[3] They found that lack of employment for parents and lack of educational opportunities for children

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[1] For a fuller discussion of the methodological issues involved in investigating social disadvantage see Bradshaw, Hoelscher and Richardson (2006, 2007).

[2] They used the OECD modified scale that assigns a weight of one to the first adult in the household, 0.5 for all other adults and 0.3 for children under the age of 15 years.

[3] The poverty line is drawn at 60 per cent of income in the EU.

were key determinants of disadvantage. This and other evidence, in conjunction with the obvious dependence of children on their families for their wellbeing, supports a focus of research on the welfare of children as a potentially vulnerable group in society.

There has been increasing international interest in quantifying disadvantage using a wide range of indicators. In the past, there has been a reliance on income measures of disadvantage but it is well-recognised that poverty is a multi-dimensional concept. In 2007, UNICEF published an extensive report on child well-being in rich countries, based on 40 indicators over six dimensions of child well-being: material well-being, health and safety, educational well-being, family and peer relationships, behaviours and risks, and subjective well-being (2007). Unfortunately, Australia was not included in the overall final ranking due to data limitations, but Table 1 presents the results for selected indicators for which Australian data were available, compared with the two countries that ranked highest, on average, on measures of well-being, the Netherlands and Sweden, and the two countries that ranked lowest on the overall measures, the United States and the United Kingdom.[4] The OECD average is also included in the table.

The results show that Australia was close to the OECD average on the proportion of children living in households with equivalent income less than 50 per cent of the median household income and on the infant mortality rate. Performance was above the OECD average on a number of education-related indicators such as literacy rates and availability of resources in the home. There were more accidental deaths among young people in Australia than on average in the OECD. A relatively high proportion of Australian children lived in households with no working parent. This has been shown in earlier studies to have negative implications for the well-being of children (UNICEF 2005, Bradbury 2003).

While these measures focus on the child population as a whole in each country, this paper investigates differences between *geographical areas*. Disadvantage has a geographical dimension and there are a number of reasons why the area in which children grow up may be important. Neighbourhood or location of residence may be important if there are some externalities involved in having people with particular economic or social characteristics concentrated in an area that go beyond any effects measured at the individual level. Bradshaw, Kemp, Baldwin, and Rowe define a neighbourhood effect as 'the net change in the contribution to life-chances made by living in one area rather than another' (2004:86).

There are also arguments at a practical level for focusing attention on small area data. Barnes, Wright, Noble and Dawes (2007) justify their development of an index

[4] For a recent international comparison of child poverty rates see Smeeding (2006).

of multiple deprivation for South African children at a small area level using the following four arguments. First, that geographical patterns of social disadvantage are not random but a result of 'dynamic social processes, economic change, migration, availability and costs of living space, community preferences, and policies that may distribute particular groups to certain areas or exclude them from others'(p. 4). Second, that identifying concentrations of disadvantage enables policies to be more effectively targeted. Third, it may also highlight the areas where local services may struggle to provide effective support. And, fourth, that the importance of different underlying determinants of social disadvantage may differ between areas and identifying these differences may also facilitate policy development.

There is a substantial international literature presenting small area measures of social disadvantage for the population as a whole and for children that will not be reviewed here. The EU and its Member States have developed small area indicators in recognition of the dispersion of risk of social disadvantage among member countries and within them (see for example, EU 2005, Noble et. al 2004, Noble et. al. 2001). In the US, there are several data sources focussed on the well-being of children across the 50 states (see for example, the official Childstats, 2008; the Annie E. Casey Foundation, 2008; and Land and Crowell, 2008). Rather than summarise the conclusions of this research, the discussion here will focus on Australian results.

There are Australian studies that present indices of disadvantage at the small area level for the whole population and national indicators that relate to children. Since 1986, the ABS has calculated the Socio-economic Indexes for Areas (SEIFA) for the whole population using Census data. The index compares outcomes with respect to income, educational attainment, unemployment and dwellings without motor vehicles at the local area level (ABS 2003). A comparison between SEIFA and the child social exclusion index for 2001, calculated as part of this research project, shows that there are similarities between the two in the areas identified as disadvantaged but there are also some important differences (Tanton et al 2008).

At the level of the whole population, a recent study by Vinson (2007) based on an earlier study of the two most populous states, New South Wales and Victoria (Vinson 2001), is also widely used. Vinson (2007) included a wider range of indicators than those found in SEIFA, with data on 20-25 indicators at the postcode level being used to compare outcomes for individual indicators and in a combined index.[5] He found that there was considerable concentration of disadvantage within

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[5] These included in five categories: Social distress - low family income, rental stress, home purchase stress, lone person households; Health – low birth weight, childhood injuries, deficient immunization, disability/sickness support, mortality, mental health patients, suicide; Community safety- confirmed child maltreatment, criminal convictions, prison admissions, domestic violence; Economic – unskilled workers, unemployment, long-term

each Australian state and more than half the disadvantaged postcodes were in rural areas. Where comparisons with his earlier work in New South Wales and Victoria were possible, he found that the ranking of areas did not change greatly between 1999 and 2006. In his principle component analysis that combined each of the factors into an index, the results show that the indicators with the highest weight were low family income, limited computer use, early school leaving, incomplete high school education, no internet access, disability/sickness support, long term unemployment and criminal convictions. Vinson concluded that these indicators –

> 'tell the mundane but enduring story of the disadvantaging consequences of limited education and associated lack of information retrieval and exchange skills, deficient labour market credentials, poor health and disabilities, low individual and family income and engagement in crime. Localities with markedly high rankings on these and other forms of disadvantage are areas in which child maltreatment is also more likely to come to notice' (2007:96).

In another study aimed at developing a range of indicators of social disadvantage in Australia, researchers at the Social Policy Research Centre (SPRC) asked welfare recipients in focus groups and written questionnaires, and the wider community via a postal survey, to outline what they believed was essential to achieve a decent standard of living (Saunders 2007; Saunders et al 2007). The results from the postal survey and the written questionnaire for welfare recipients show a close similarity. Each placed secure housing, warm clothes, a substantial meal and access to medical services at the top of their lists of essentials. Other quality of life indicators such as availability of care and support services and being treated with respect also ranked highly. This project is on-going and these results will be used to develop measures of disadvantage and policy responses.

The SPRC survey results, based on adult responses about children, have also been used to develop nine indicators of social exclusion for Australian children.[6] The authors estimate that one in six children (about 800,000 children) live in households experiencing social exclusion, defined here as experiencing four of the nine indicators listed in the footnote below (Saunders and Naidoo 2008).

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unemployment, dependency ratio, low mean taxable income, computer use/access to internet; Education – non-attendance at preschool, incomplete education (17-24 year olds), early school leaving, post-school qualifications.

[6] The nine indicators were – no week's holiday away from home each year, children do not participate in school activities and outings, no hobby or leisure activity for children, no medical treatment if needed, no access to a local doctor or hospital, no access to a bulk-billing doctor, does not have $500 in emergency savings, could not raise $2,000 in a week in an emergency and lives in a jobless household.

Table 1: Selected Indicators of Child Well-being

	OECD Mean	Australia	The Netherlands	Sweden	United Kingdom	United States
% children 0-17 years in households with equivalent income less than 50% median	11.3	11.6	9.0	3.6	16.2	21.7
% children aged 15 reporting less than 6 educational possessions	27.0	16.4	18.3	18.2	20.1	24.2
% children aged 15 reporting less than 10 books in the home	7.9	4.9	12.6	4.5	9.4	12.2
% working aged households with children without an employed parent	5.0	9.5	5.7	2.7	7.9	2.3
Infant mortality rate (per 1000 live births)	4.6	4.8	4.8	3.1	5.3	7.0
Deaths from accidents and injuries per 100,000 less than 19	14.3	15.1	9.0	7.6	8.4	22.9
Reading literacy achievement aged 15	500	525	513	514	507	495
Mathematics literacy achievement aged 15	505	524	538	509	508	483
Science literacy achievement aged 15	504	525	524	506	518	491

Source: UNICEF (2007) The data for each series relate to different years in the early part of this decade.

There have been a range of other studies of disadvantage among children in Australia (see the Commonwealth of Australia Senate Community Affairs Reference Committee 2004 for a survey). These studies are often specific to particular fields and have not been conducted within the broad framework of social exclusion established in the literature. One example is the annual series of indicators on health issues prepared by the Australian Institute of Health and Welfare (AIHW) since 1996 (see AIHW 2008). In 2005 the Brotherhood of St Laurence published the first of their social barometers on Australian children. This included data on a wide range of indicators such as physical health, mental health, housing and homelessness, education, physical safety and income (Scutella and Smyth 2005). Some of the issues discussed in this report receive more detailed consideration in Stanley, Richardson and Prior (2005).

This brief survey shows there are many examples of Australian indicators of social disadvantage for the population at a small area level and a range of national indicators for children. However, the indices of risk of social exclusion developed by the current authors are the only comprehensive Australian indices focused on children now available at a small area level. A series of papers by the current authors has developed small area indicators for Australian children aged 0-15 years for 2001, focussing on a wider definition of social disadvantage than income poverty. (Harding et al, 2006; Daly et al 2008, Tanton et al 2008). The results for 2001 showed that the risk of social exclusion was not distributed evenly across Australia. Children in rural areas were more likely to be at risk than children living in urban areas. Those living in the less populous states and territories of Queensland, Tasmania, the Northern Territory and, to a lesser extent, in South Australia, were more likely to be living in a small area where children were at high risk of experiencing social exclusion than children living in the other states. This reflects the fact that more children in Queensland, Tasmania and the Northern Territory lived in sole parent families (particularly where no one was in employment), and in families with low levels of education. Results were similar for pre-school children aged 0-4 and those of school age, 5-15 years.[7]

This paper extends our earlier work by comparing the spatial distribution of child social exclusion risk between 2001 and 2006, and analysing the characteristics of

[7] It should be noted that the results for 2001 presented in Harding et al. (2006) are not comparable with those presented in this paper and the earlier results are regarded as less reliable than those presented here. The differences include refinement of the methodology (so that living in a family with low income is no longer regarded as a necessary pre-condition for consideration for being in social exclusion); revised data for 2001; and changes to the 2001 data to make variables and small area boundaries consistent with those for 2006.

areas that remained persistently high risk across that period, and those that moved in to or out of the highest risk categories.

2 Methodology

2.1 Data source and variable selection

The data used in this research project are taken from the 2001 and 2006 Censuses of Population and Housing. The Census is conducted every five years by the Australian Bureau of Statistics (ABS), and 2006 is the latest year for which census data are available. The Census is the most comprehensive single source of small area data available in Australia covering areas relevant to child social exclusion, and its collection every five years means that changes can be tracked over time. As our focus is the development of indicators of child social exclusion risk that can be applied at a small area level and compared over time, it is very suitable for our purposes. However, it does contain only a limited set of variables, and some child-related indicators are not available through this data source – in particular, measures of child health and child educational/developmental achievement.

Previous work (see Harding et al 2006; Tanton et al 2008) describes our choice of census variables for capturing child social exclusion risk at a small area level. Briefly, the variables we use are proxies for the four domains of social exclusion identified by Burchardt, Le Grand and Piachaud (2002) following Atkinson (1998). These domains are consumption, production, involvement in politics and organisations, and support and interaction at a family and community level. While these domains are not specifically related to children, our emphasis in this work on children living in families makes them a suitable basis for developing child-level indicators of social exclusion risk. In our study, consumption is proxied through using a measure of household income, and production through measures of parental joblessness and family occupations. Involvement in politics and organisations is difficult to measure with census data, but research in the United States suggests that those who invest in human capital also invest in social capital (see Brown and Ferris 2004; Glaeser et al 2002). In particular, Glaeser et al (2002) found membership in groups was positively associated with educational attainment. We have therefore used a measure of the education attainment of adults in the child's household to proxy this dimension. We use family type, housing tenure and motor vehicle availability variables to capture the social interaction and support dimension of social exclusion risk. The variables included in the index used here are shown in Table 2.

Because we were producing the child social exclusion index for two years, it was necessary to use only those variables that were available in both years of the Census. Unfortunately, the variable capturing computer use was very different between the two Censuses. In 2001, a Census variable was available which captured information about whether or not household members used a computer at home and, in our earlier work focusing on 2001 only, we used this variable to capture home computer availability. However, in 2006, the computer use variable on the census instead focused on internet connections, and was based on a question which asked respondents whether they had access to the internet at home and, if so, through what sort of connection (dial up, broadband or other). While this variable probably better captures the "digital divide" in which we are interested, because it was a new variable in 2006 we cannot use it for this over-time comparison.

The other variable which was affected by changes between the two Censuses was the data related to family education. There were a number of changes to the way these data were collected in 2006 compared with 2001, particularly in relation to the treatment of vocational training qualifications. In addition, the 2001 Census variable which captured highest educational attainment included a category "still at school", but this category was no longer included in the highest educational achievement variable in 2006. While these changes do mean that the two education variables are not directly comparable over time, the impact of the changes on the variable we created for use in our index are likely to be relatively small, and we have kept the family education variable in our index, and have analysed its change over time as an individual variable. However, these issues of over-time comparability should be kept in mind when interpreting the results in this paper.

The other variables listed in Table 2 were unaffected by changes in Census questions between 2001 and 2006. However, there were some changes (particularly for some variables, most notably labour force status) in the percentage of "not stated" responses received between 2001 and 2006. Data quality statements produced by the ABS for 2006 suggest that these are mostly due to improved collection methodology. In order to reduce the effects of these changes between 2001 and 2006 in our analysis, we have removed all "not stated" responses from our analysis before calculating the proportion of children with particular characteristics for inclusion in the indexes. Nevertheless, it should be kept in mind when interpreting results that the proportion of "not stated" responses did change for some variables between 2001 and 2006 with changes in the range of 1 to 3 percentage points.

Table 2 List of social exclusion variables used in CSE Index

Variable in Census	Measure included in CSE Index
Family Type	Proportion of dependent children aged 0 – 15 in single parent family
Education in family	Proportion of dependent children aged 0 – 15 with no-one in the family having completed Year 12
Occupation in family	Proportion of dependent children aged 0 – 15 with highest occupation in family blue collar worker
Housing tenure	Proportion of dependent children aged 0 – 15 living in public housing
Labour force status of parents	Proportion of dependent children aged 0 – 15 in family where no parent is working
Motor Vehicle	Proportion of dependent children aged 0 – 15 living in household with no motor vehicle
Income	Proportion of dependent children aged 0 – 15 in household with income in bottom quintile of equivalent gross household income for all households in Australia

Data source: ABS Census of Population and Housing 2001, 2006

The data used in this study were specially prepared for the authors by the ABS from the census unit record files, which include data on individuals, families, households and their location of enumeration. All children and dependent students under the age of 16 years are included in our definition of children, and each child has been given the characteristics of the family and household in which they were enumerated on census night. Because all of our variables are at a family or household level, our data relates only to those children who were enumerated in their place of usual residence on Census night, as we wished to capture the characteristics of those families and households in which children usually lived, rather than those of a family or household they might simply have been visiting on Census night.

The data were provided in cross tabulated form by SLA and therefore some cells had very small cell counts (n <=3), and these were randomised by the ABS. It is estimated that this randomisation has a minimal effect on the final aggregated data, due to the method of randomisation used by the ABS.

2.2 Spatial unit

The indices and individual variables reported in this paper are calculated using the Statistical Local Area (SLA) as the base spatial unit of analysis. This geographical unit was chosen from the ABS Australian Standard Geographical Classification (ASGC) because it was the smallest unit with complete coverage of Australia that did not introduce the problems of data confidentiality evident at smaller area levels such as Census Collection Districts. A number of SLA boundary changes occurred between 2001 and 2006, and these have been catered for in our analysis using a concordance supplied by the ABS, with all data adjusted to 2006 SLA boundaries. Thus, for example, if a single SLA in 2001 was divided into three new SLAs in 2006, one containing 50 per cent of the population of the original SLA and the other two containing 25 per cent each, all of our statistics for the original SLA are multiplied by these concordance factors (.50, .25, .25), so that three new SLAs are created which share the characteristics of the original 2001 SLA. It is very important to note that this method cannot take into account situations in which the characteristics we are examining are not distributed evenly across the new SLA boundaries. If one of the new SLAs in the example above contained 25 per cent of the population of the original SLA, but 50 per cent of those children living in single parent families in the original SLA, this will not be captured by this concordance method. Thus apparent changes in child social exclusion risk between 2001 and 2006 for those SLAs which were subject to boundary changes may be due in part to the boundary change itself, not to actual changes in the characteristics of the population. Where we examine these changes in risk in our analysis, we either note or remove those SLAs which were the subject of boundary changes.

There were 1,426 SLAs in Australia in 2006 ranging in population from 12 to 181,327 people. These were distributed unevenly across Australia, with some small states and territories being broken into relatively large numbers of SLAs and other larger states consisting of relatively few. For example, the Australian Capital Territory, which contains less than 2 per cent of Australia's population, had 109 SLAs (or almost 8 per cent of SLAs), while New South Wales, which contains 34 per cent of the total population, had only 200 SLAs (or just over 14 per cent of all SLAs). Of particular note was Queensland, which was divided into 479 SLAs, many of them in Brisbane and with quite low populations. Queensland thus contained 19 per cent of Australia's population, but almost 34 per cent of all SLAs.

We have addressed the issue of uneven population sizes within SLAs in two ways. First, we have aggregated up SLAs in Brisbane and Canberra (the areas most affected by relatively small population sizes within SLAs) so that they are more similar in population terms to SLAs in other areas of Australia, using a method developed by Baum et al (2005). In Brisbane, we aggregated SLAs up to local council electoral wards (using a concordance between SLAs and wards kindly supplied to us by the

Centre for Research into Sustainable Urban and Regional Futures at the University of Queensland) and in Canberra we aggregated up SLAs to Statistical Subdivisions. Secondly, we present all our analysis of quantiles (equal sized groups within a distribution) weighted by the child population in each SLA, to further control for the uneven distribution of population between SLAs.

For Brisbane, this aggregation to wards involved a two-stage concordance process. For the 2001 data, SLAs were first converted into 2006 SLAs using the concordance supplied by the ABS and then, second, these SLAs were aggregated into wards using a concordance based on 2001 SLA boundaries. For the vast majority of Brisbane small areas, SLA boundary changes had no effect on ward divisions. There were two exceptions to this, but we do not expect either of these to affect our results.

2.3 Statistical methodology

The Child Social Exclusion Index is calculated using principal components analysis This is a data summary technique that maximises the correlation between the underlying components in a group of new variables and the original set of variables. The technique produces a common underlying component that best describes the variables under analysis (see ABS 2003 and Salmond and Crampton 2002).

For each year, we first excluded from our analysis any SLAs that had either very low child populations (less than 30) or very high non-response rates on any of the index variables (80 per cent or greater non-response). In 2001 we excluded 75 SLAs in this way and, in 2006, we excluded 85 SLAs. While there was substantial overlap between SLAs excluded from the analysis in 2001 and 2006, there were some differences. Once we excluded all those SLAs which had low population and/or high non-response in either year, we were left with a total of 1045 small areas for use in our analysis.

Principal components analysis (PCA) is a suitable technique to use with a set of highly correlated variables, and initial analysis of the data for both years showed high correlations among variables. For 2006, we then ran the PCA with our set of variables, using the first component produced by the procedure as the index (standard practice in the construction of indices – see for example ABS 2003; Salmond and Crampton 2002).

The PCA produces an index value for each of the small areas included in the modelling, as well as data about the correlation between each of the input variables and the final index (the loading) and the amount of variation in the original set of variables that is explained by the new principal component variable or index (calculated from the eigenvalue). Loadings for each of the variables, and the eigenvalue for the model, are shown in Table 3, and demonstrate high correlations between the original variables and the index. In our model 69.29 per cent of the variation in the original variables is explained by the index, a

figure that is calculated by dividing the eigenvalue by the number of variables used in the principal components analysis and multiplying by 100.

Once these loadings are calculated, we create a set of weights from these results by dividing the loading for each variable by the square root of the eigenvalue. One of the advances of this paper is that these weights, calculated for 2006, are then applied to data from both the 2001 Census and the 2006 Census to calculate comparable estimates of child social exclusion for both years. So we are using the 2006 Census data to derive child social exclusion weights; and then applying these same weights to both 2001 and 2006 Census data. In this way, the only thing changing between the two years is the data; the weights used to calculate the index have not changed. This is similar to comparing indexes over time using weights that are equal for each variable (see, for example, Land et al 2007). In our case, although the weights are not equal for each variable within a single year, our use of the same weights for both years means that the variable weights are equal across time. This allows us to compare index values across the five year period

One way to think of this is that the concept of child social exclusion (that is, the weights) is defined for 2006. This 2006 concept is then applied to 2001 data, so the concept does not change between 2001 and 2006; only the underlying data that this concept is applied to does. The only change between 2001 and 2006 in an area will be because it has got richer (or poorer); has a changed education mix; or a higher proportion of employed people, and so on, and the impact of each of these changes on the index will be determined by the weight calculated from the 2006 data. Looking at Table 3, it can be seen that a change in the incomes of an area (with income having a loading of .92) will have a greater impact on the index than a change in the mix of family types (with family type having a loading of .73).

Finally, in order to produce results that would be easily interpretable, as well as to address the issue of unequal population numbers in small areas, we used the final index scores for 2001 and 2006 to calculate child-population weighted deciles of child social exclusion risk for both these years. The results below are presented using these deciles, with the lowest decile representing the highest risk of social exclusion, with higher deciles representing lower risk of social exclusion. Our bottom social exclusion decile thus represents the *10 per cent of children* (rather than 10 per cent of small areas) facing the highest risks of being socially excluded.

Table 3 Principal components analysis loadings, 2006

	Loadings
	All dependent children 0 - 15 years
Family type	0.73
Education	0.90
Occupation	0.73
Tenure type	0.84
Labour force status	0.84
Motor vehicle	0.84
Income	0.92
% variance explained	69.29

Data source: ABS Census of Population and Housing 2006; authors' calculations

2.4 Limitations

This study has a number of important limitations. These have all been referred to in the discussion of our methodology, but are summarised again here. First, while the variables we include in our analysis reflect important domains of child social exclusion, difficulty in obtaining national data at a spatially disaggregated level means that some dimensions of child social exclusion cannot be covered in our analysis, or can only be covered through the use of variables that serve as broad proxies for underlying constructs. Second, while we adopt two methods (as described above) for addressing the issue of uneven population sizes across SLAs, this factor may nevertheless still affect our results. Third, the focus of this analysis on changes over time has limited the number of small areas for which we are able to produce results, as we can only make over-time comparisons for those small areas that have valid data for both 2001 and 2006. Fourth, changes to the way education data has been recorded in the Census between 2001 and 2006 need to be kept in mind when interpreting our results, although we do not expect these changes to have had a substantial effect on our over-time comparisons. Finally, while we have applied a concordance to the 2001 SLAs to align them with 2006 SLA boundaries, this concordance does not take into account the ways in which population characteristics

may be unevenly distributed among those SLAs which have been subject to boundary changes. Thus apparent changes in child social exclusion risk for small areas that experienced boundary changes between 2001 and 2006 should be interpreted with caution.

3 Results

3.1 National overview

The nation as a whole experienced unprecedented prosperity between 2001 and 2006. The unemployment rate fell from the annual average of 6.8 per cent in 2001 to 4.8 per cent in 2006. On average, another 1.1 million Australians found jobs and in 62 per cent of cases these were full-time jobs (ABS 2008). Average weekly earnings increased from $A811.50 a week in the December quarter of 2001 to $A1013.6 a week in the same quarter of 2006. All these economic changes were reflected in growing affluence, with the Australian Bureau of Statistics reporting that average household incomes increased by 19 per cent between 2000-01 and 2005-06, after the payment of income tax and after adjustment for inflation (ABS, 2007a, p. 13). The gap between rich and poor showed little change over this period, with the incomes of the poorest one-fifth of Australians increasing by 23.8 per cent, the middle one-fifth by 18.9 per cent and the top one-fifth by 19.5 per cent (ABS, 2007a, p. 13). So, at a national level, the economic boom was widespread and the nation prospered. But did children share equally with adults in this booming economy?

As shown in Table 4, there have been some improvements between the period 2001 and 2006 in some of the key indicators of child social exclusion. The proportion of Australian children with neither parent working fell from 18 per cent to 16 per cent between 2001 and 2006, and the proportion of children living in families where no-one had completed Year 12 also fell substantially across the period. These are promising developments, although it should also be noted that the proportion of children living in low income families (a key driver of social exclusion) and the proportion of children living in single parent families did not change across the period. In addition, the fact that, even by 2006, a relatively large proportion of children are living in jobless families, is concerning, especially given Australia's currently low unemployment rates.

It should be noted again that there were some differences in the way education data was collected and reported between the 2001 and 2006 Censuses, so the relatively sharp fall in the proportion of children living in families where no-one had

completed Year 12 should be interpreted cautiously. However, in the context of our variable creation methodology, it is likely that, had we been able to overcome problems with exact comparisons over the two Censuses, we would have seen a slightly stronger fall in the number of children living in families where no-one had completed Year 12, rather than any effect in the opposite direction. In addition, when we checked these results against alternative sources of data, we found substantial support for our results. The take-up of vocational qualifications of at least Certificate III level for all Australians rose substantially between 2001 and 2006, (see ABS 2007b) and the proportion of household reference persons in Australia with no higher education fell from 54.8 per cent in 1995/96 to 44.9 per cent by 2005/06 (Vu et al 2008).

Table 4 Characteristics of the families of Australian children, 2001 and 2006

Characteristics	2001	2006
	SLAs=1045	
Proportion children in single parent families	0.19	0.19
Proportion children in families with no family Year 12	0.25	0.20
Proportion children with highest parental occupation blue collar	0.18	0.17
Proportion children living in public housing	0.07	0.05
Proportion children with neither parent working	0.18	0.16
Proportion children in families with no motor vehicle	0.05	0.04
Proportion children in families with low income	0.19	0.19

Note: Data related to family education levels may be affected by changes to the Census data for this variable between 2001 and 2006.

Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

3.2 A Narrowing Gap?

The national results thus suggest that, on some indicators, the fortunes of Australia's children improved between 2001 and 2006. Were these gains equally shared across Australia, or did the circumstances of children living in some neighbourhoods improve much more than those living elsewhere? To begin to examine this question we first look at whether the gaps apparent between children at low and high risk of social exclusion narrowed.

These results are shown in Table 5, and highlighted by the charts in Figures 1 and 2. The results suggest that positive change between 2001 and 2006 was generally stronger for children living in areas at highest risk for child social exclusion compared with those living in areas at least risk for social exclusion, suggesting narrowing gaps on some key indicators. For example, the proportion of children living in families where no-one completed Year 12 fell by 7 percentage points in the highest risk small areas, while this proportion fell by only 2 percentage points in the least risk areas. Similarly, in the most at risk areas the proportion of children living in

jobless families fell by 3 percentage points, while in the least at risk areas this figure actually rose slightly.

On the other hand, some indicators improved more in the lowest risk small areas. The proportion of children in low income families (defined here as the bottom quintile of equivalised gross household income) actually rose by 2 percentage points in the most excluded areas, while remaining unchanged in the least excluded areas. Similarly, the proportion of children living in single parents families also rose slightly in the highest risk areas, while falling slightly in the lowest risk areas.

3.3 Rural children face higher risks

Figures 3 and 4 show the distribution of child social exclusion risk between children living in capital cities and children living in the balance of Australia for 2001 (Figure 3) and 2006 (Figure 4). In these graphs, if capital city and rural children faced the same risk of social exclusion, then each bar would contain about 10 per cent of children – clearly, this is not the case for most deciles of social exclusion risk. In both years, rural children face the highest risk of social exclusion, but the magnitude of difference in this relative risk narrowed between 2001 and 2006. In 2001, only 8.1 per cent of children living in Australia's capital cities fell into the highest risk decile of social exclusion risk but, by 2006, this proportion had grown to 9.4 per cent. However, the gains that rural children have made in the highest risk decile need to be interpreted in the context of an increase in the representation of rural areas in the second highest risk decile (decile 2) in 2006 compared with 2001. (In other words, it appeared that some of the disadvantaged rural areas improved, but only by enough to shift them up to the second decile.)

The persistence of advantage is also demonstrated in a comparison of Figures 3 and 4. At the most advantaged end of the spectrum, in the decile with the lowest risks of social exclusion, there was no substantial change, with almost all children in this lowest risk decile in both years living in capital cities.

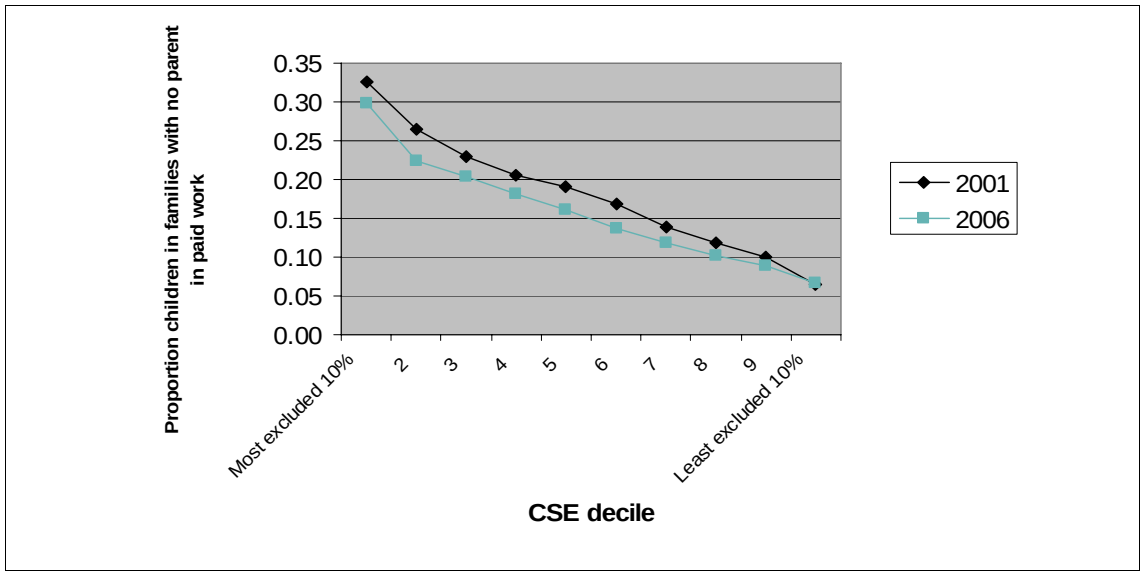
Table 5 Changes in Key Indicators of Risk Within Each CSE Decile, 2001 and 2006

		CSE Decile									
		Most excluded 10%	2	3	4	5	6	7	8	9	Least excluded 10%
Proportion children in sole parent families											
	2001	0.27	0.25	0.23	0.21	0.21	0.18	0.17	0.16	0.15	0.11
	2006	0.28	0.24	0.24	0.22	0.21	0.18	0.17	0.16	0.14	0.10
Proportion children in families with no family Year 12											
	2001	0.40	0.33	0.31	0.29	0.28	0.25	0.23	0.19	0.13	0.07
	2006	0.33	0.27	0.25	0.25	0.23	0.20	0.16	0.14	0.09	0.05
Proportion children with highest parental occupation blue collar											
	2001	0.25	0.22	0.21	0.22	0.20	0.20	0.18	0.16	0.11	0.06
	2006	0.24	0.22	0.21	0.20	0.19	0.18	0.17	0.14	0.10	0.06
Proportion children living in public housing											
	2001	0.17	0.10	0.07	0.07	0.06	0.06	0.04	0.04	0.03	0.01
	2006	0.15	0.07	0.07	0.06	0.06	0.04	0.03	0.03	0.02	0.01
Proportion children with neither parent working											
	2001	0.33	0.27	0.23	0.21	0.19	0.17	0.14	0.12	0.10	0.06
	2006	0.30	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.09	0.07
Proportion children in families with no motor vehicle											
	2001	0.11	0.07	0.06	0.05	0.05	0.04	0.03	0.03	0.03	0.02
	2006	0.11	0.05	0.05	0.04	0.04	0.03	0.02	0.02	0.02	0.01
Proportion children in families with low income											
	2001	0.32	0.26	0.24	0.22	0.20	0.19	0.16	0.14	0.11	0.07
	2006	0.34	0.26	0.24	0.22	0.20	0.17	0.15	0.13	0.11	0.07

Note: Proportions of children with particular characteristics are calculated as a proportion of all children within the total population of children living in a particular set of small areas. Data related to family education levels may be affected by changes to the Census data for this variable between 2001 and 2006.

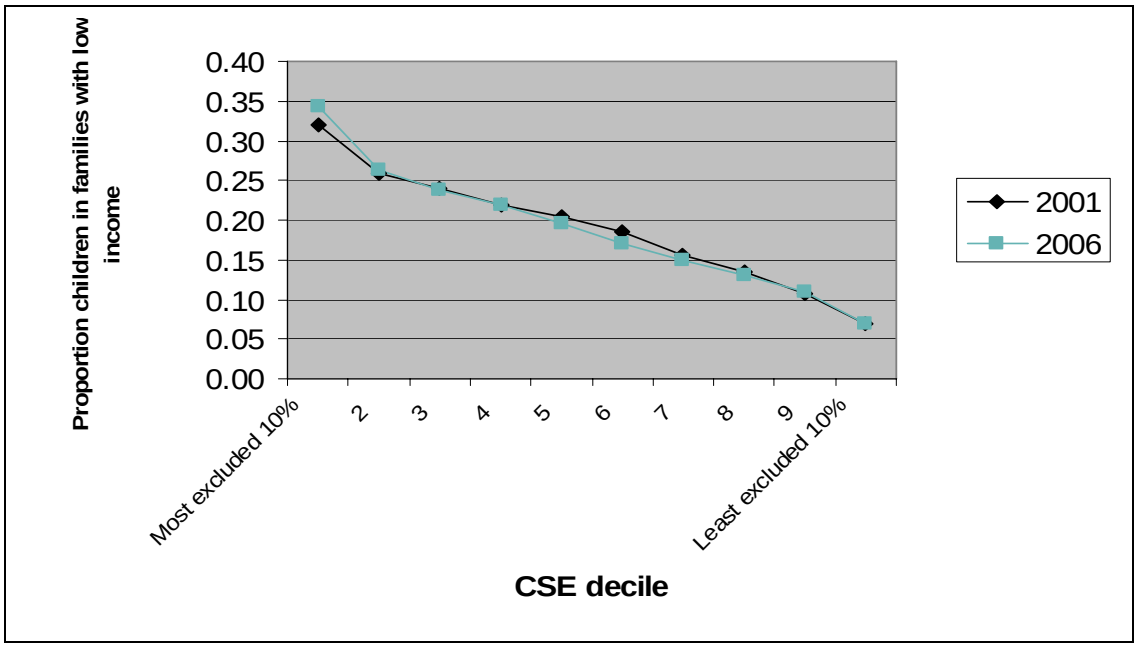
Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

Figure 1 Proportion of children in families where no parent has paid work, by CSE decile, 2001 and 2006



Note: Proportions of children with particular characteristics are calculated as a proportion of all children within the total population of children living in a particular set of small areas.
Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

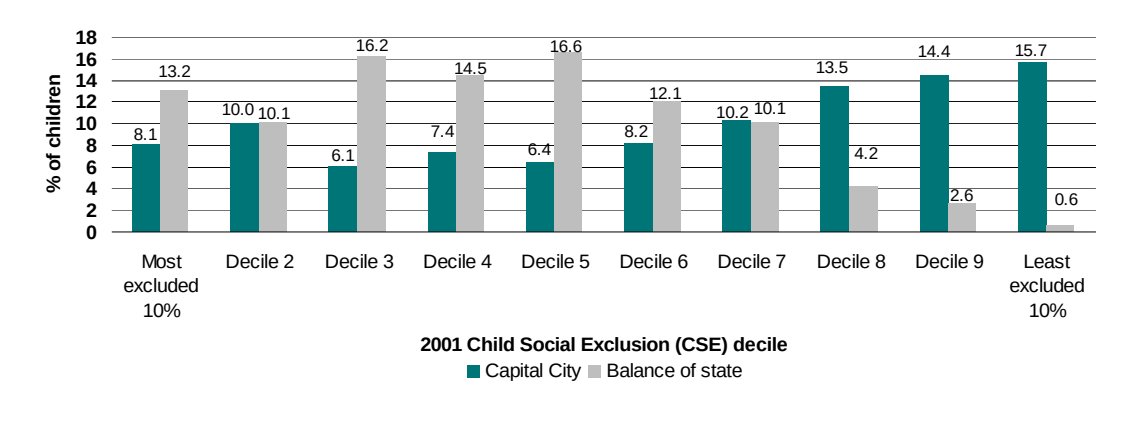
Figure 2 Proportion of children in families with low income by CSE decile, 2001 and 2006



Note: Proportions of children with particular characteristics are calculated as a proportion of all children within the total population of children living in a particular set of small areas. Low income is defined here as children living in households with equivalised gross income that falls into the bottom quintile of all Australian household incomes
Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

It should be noted that the aggregated figures shown in Figures 3 and 4 include SLAs that were the subject of boundary changes between 2001 and 2006. Thus the results showing changes in the capital city/balance of state mix across the period should be interpreted cautiously, as they could be affected by these boundary changes. The possible effects of boundary changes on our results were noted in the methodology section, and the division of a number of very large SLAs into several smaller areas, particularly in Sydney, may have had some effect on the apparent increase in the social exclusion risk of capital city children.

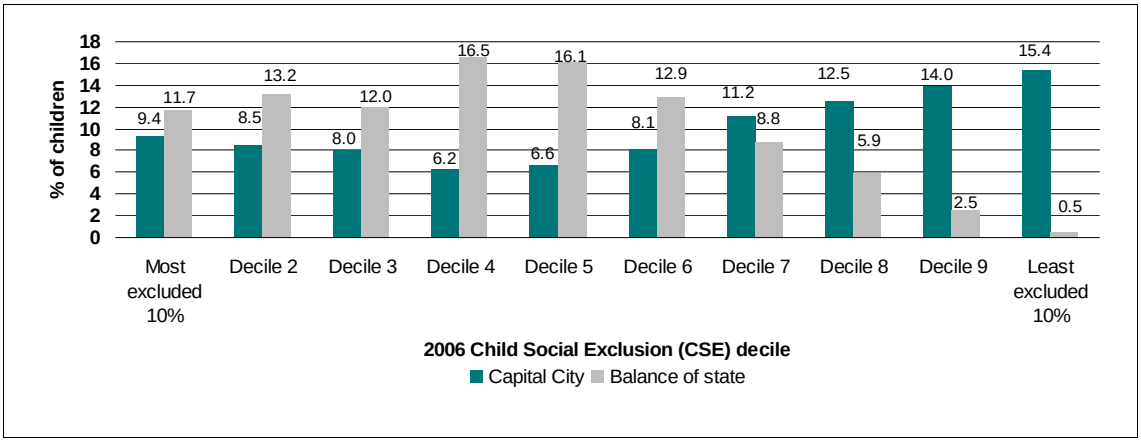
Figure 3 Proportion of children in CSE deciles, capital cities vs balance, 2001



Note: The figure shows, for example, that in 2001 8.1 per cent of all those children living in capital cities lived in areas that faced the highest risks of social exclusion. Similarly, 13.2 per cent of all those children living outside capital cities lived in areas that faced the highest risks of social exclusion.

Data source: ABS Census of Population and Housing 2001; authors' calculations

Figure 4 Proportion of children in CSE deciles, capital cities vs balance, 2006



Data source: ABS Census of Population and Housing 2006; authors' calculations

In the next section, we look at the apparent changes in child social exclusion risk — and in the individual characteristics that we use to define social exclusion at a small area level. This type of analysis allows us to see whether social exclusion risk is falling into spatial clusters, and to look at the factors which may be driving persistent risk or improving child social exclusion risk.

3.4 Small area changes

Figures 5 and 6 show the spatial distribution of child social exclusion risk using our composite measure (the CSE Index) for 2001 (Figure 5) and 2006 (Figure 6). These maps show child population weighted deciles of child social exclusion risk for Australia as a whole, and for the capital cities (insets). The darkest colour on the maps represents the highest risk of child social exclusion (the bottom decile), while the lightest colour represents the least child social exclusion risk (the top decile).

Overall spatial patterns of social exclusion risk are relatively similar for both years, suggesting that there is only slow movement in spatial patterns of relative advantage and disadvantage. As shown in the charts in the previous section, capital city areas are less likely to show high risk of child social exclusion than rural and regional areas, although all the capital cities except Canberra show some areas of high risk. The tendency for the risks of capital city and 'balance of Australia' children to narrow between 2001 and 2006, as demonstrated in the previous section, is less obvious on the maps in this section, as the maps show *areas* of risk, rather than *proportions of children* with particular characteristics associated with higher risk. In terms of areas, 29 capital city small areas fell into the highest risk social exclusion decile in 2001, compared with 31 in 2006.

The large areas of high social exclusion risk in Australia's remote central and northern areas reflect the substantial disadvantage that other research has established that many children in these areas face, particularly indigenous children (see, for example, AIHW 2007; SCRGSP 2007). It should be noted, however, that these areas, while geographically very large, have relatively low populations, so that children living in these areas represent a relatively small percent of all those Australian children who live in areas with high social exclusion risk. Nevertheless, the concentration of disadvantage in these remote areas is concerning.

Looking further into this, the correlation between the proportion of indigenous children living in an area and the child social exclusion index is very high. Table 6 compares quintiles of child social exclusion risk, and child weighted quintiles of indigenous child population within SLAs for 2006. Quintile 1 for child social exclusion represents those areas with the highest social exclusion risk, while Quintile 1 for the indigenous child population represents those areas with the lowest proportion of indigenous children. The raw Pearson correlation coefficient between the two measures is 0.84, and when the quintiles for the CSE index are compared to the quintiles for the proportion of indigenous children, we find that nearly all areas with a high proportion of indigenous population are also areas with a low child social exclusion index.

Table 6 **Child Social Exclusion Index quintiles and indigenous children quintiles for small areas, 2006**

	Indigenous Quintile				
Child Social Exclusion Quintile	1	2	3	4	5
1	35	36	46	55	85
2	56	57	47	33	2
3	130	52	29	25	0
4	140	26	12	7	0
5	119	4	7	4	0

Data source: ABS Census of Population and Housing 2006; authors' calculations

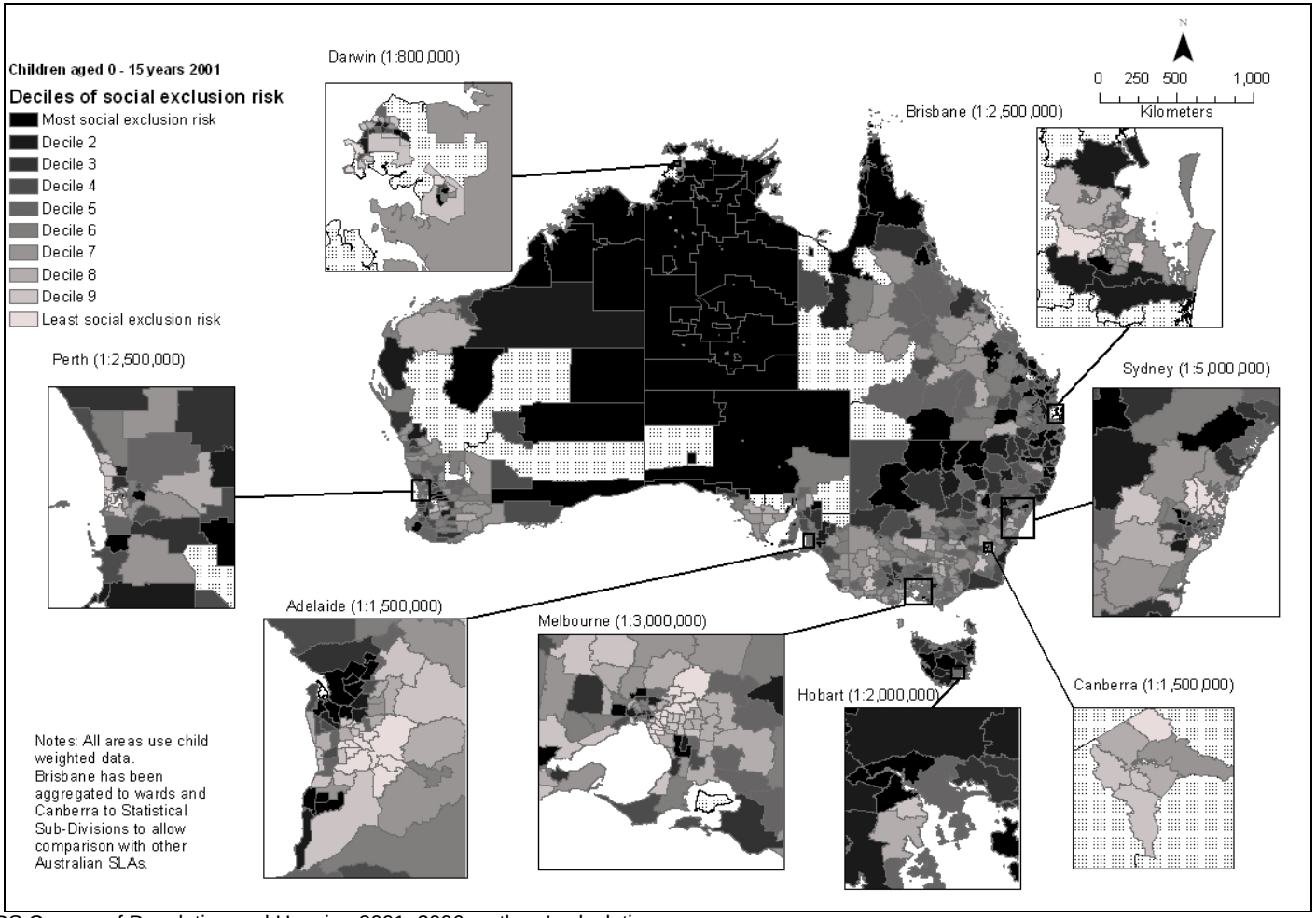
Also highly represented in the top two deciles of child social exclusion risk in both years are many small areas outside the capital cities in Australia's more densely populated south and east coast regions. Capital city small areas in which child social exclusion risk is high vary, but across both years there is a tendency for areas on the city fringe, rather than in city centres, to face greater child social exclusion risk.

Thus, overall, the spatial picture of child social exclusion risk changed relatively little over the 5 years between 2001 and 2006, despite a tendency for more capital city children to be in the highest risk social exclusion decile in 2006 than in 2001. Comparison of the two maps, however, also demonstrates that the risks of social

exclusion appear to have decreased in the 'resources boom' cities of Perth and Brisbane. This correlates well with recent research on spatial income trends in Australia, which suggested that average household incomes had increased more rapidly in Brisbane, Perth and Darwin between 2001 and 2006 than in the older cities of Sydney, Melbourne and Adelaide, underlining the nature of the 'two-speed economy' currently existing within Australia (Vu et al. 2008)

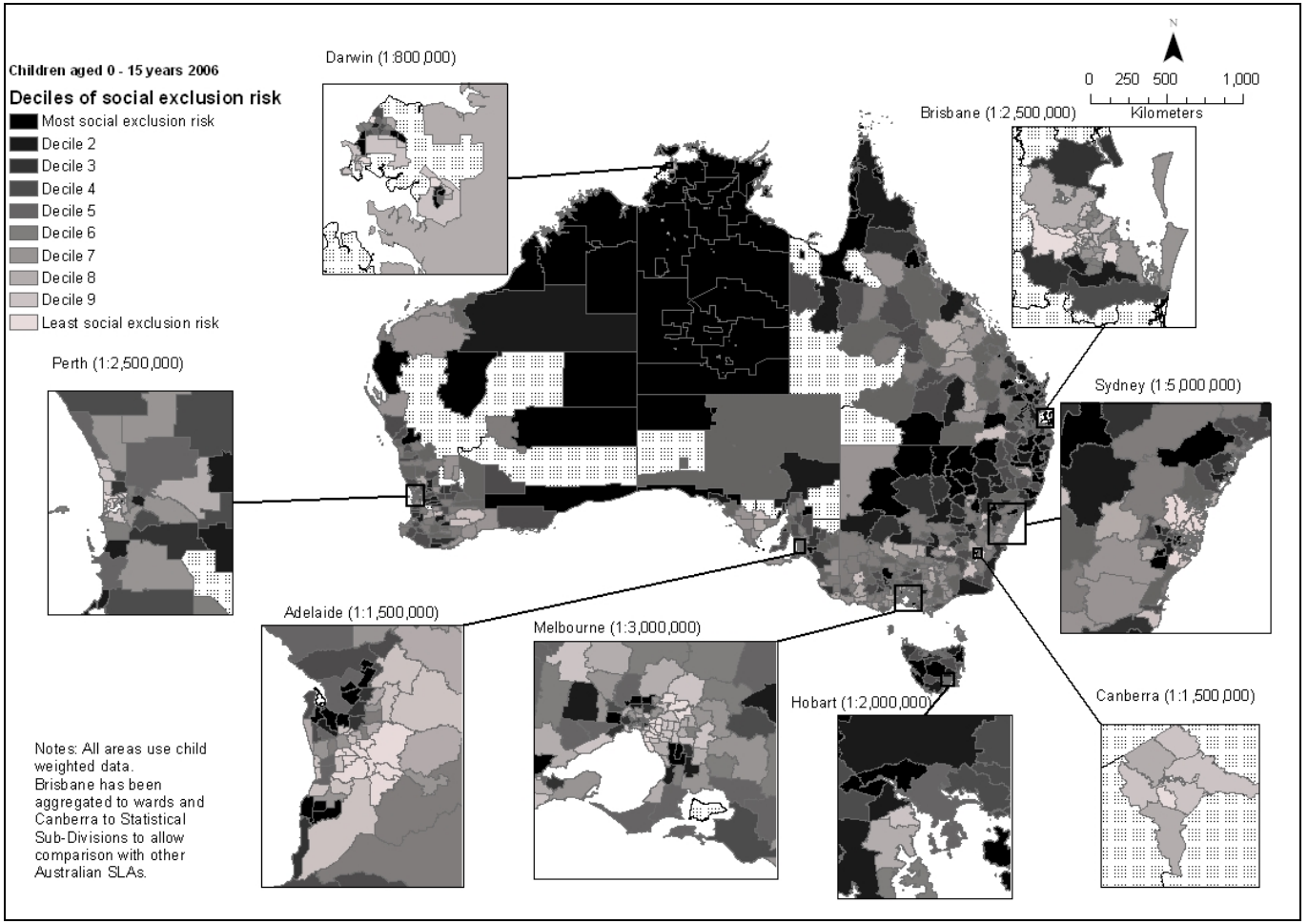
In the next section we examine what factors may be driving the persistence of high child social exclusion risk in many areas — and also what factors may be helping lift some small areas out of the highest risk two deciles of our composite measure. We do this by examining differences at a small area level in the characteristics that make up the index, examining differences between the best and worst performing small areas and those small areas that have improved in terms of child social exclusion risk, as well as changes in characteristics over time. Because of the substantial difference in social exclusion risk between capital city small areas and those in Australia's regional balance, we show results for capital cities and the balance of Australia separately, as well as providing an overall picture.

Figure 5 Small area distribution of child social exclusion risk, dependent children aged 0-15 years, 2001



Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

Figure 6 Small area distribution of child social exclusion risk, dependent children aged 0-15 years, 2006



Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

3.5 Persistently high child social exclusion risk areas

Some differences in the drivers of child social exclusion risk for capital city and other areas are evident in Table 7, which shows the proportion of children with those characteristics that underlie the CSE index in those small areas that were in the two highest risk deciles of social exclusion in both 2001 and 2006, as well as those areas that were in the two deciles of lowest risk in both years. It is important to note that substantially less capital city small areas fell into the persistently high risk group than rural small areas (n= 36 compared with n=174), although the more populous nature of the urban areas means that the child populations are relatively similar, with just over 280,000 children living in capital city 'persistently high risk' areas, compared with just over 310,000 children living in balance of state 'persistently high risk' areas (results not shown).

The most notable differences in the drivers of social exclusion risk between persistently high risk urban and persistently high risk rural areas relate to parental education levels and joblessness. For those small areas which appeared in the two highest risk deciles of child social exclusion in both 2001 and 2006 the proportion of children living in families where no family member had completed Year 12 was substantially higher in Australia's rural balance than in the capital cities — although this proportion fell by around the same number of percentage points in both regions across the period. Children in persistently low decile rural small areas were also slightly more likely to be living in single parent families than those in capital cities, and this figure rose slightly for both regions between 2001 and 2006. Children living in persistently low decile capital city areas, on the other hand, were more likely to be living in families where the highest level of occupation was blue collar, and where no parent was working, with the difference between capital city and non-capital city areas in parental joblessness widening slightly across the five year period. Interestingly, the absence of a motor vehicle in the household was more common in rural and regional than capital city areas. Low income was more marked in rural areas in 2001 but, by 2006, both capital city and rural high risk areas had the same proportion (31%) of children living in low income families.

When we contrast those small areas that were in the bottom two deciles of child social exclusion risk for both years with those that were in the top (least risk) two deciles for both years, sharp differences between the two sets of small areas can be seen, for both capital city and non-capital city areas. For example, in 2006, children living in those areas that fell into the lowest risk deciles in both years are around three times less likely to be living in jobless families than those in the highest risk areas — and around four times less likely to be living in a family where no-one has completed year 12.

Relativities between the highest risk and lowest risk areas remained fairly stable across the five year period, although the proportion of children living in jobless families and the proportion living in families in which no-one had completed Year 12 fell somewhat more sharply in the highest risk than the lowest risk areas, for both capital cities and the balance of Australia. On the other hand, the proportion of children living in single parent families rose in the persistently high risk areas for both capital cities and regional areas, and remained stable or fell in the least high risk areas.

Table 7 Characteristics of small areas with persistently high and low child social exclusion risk, 2001 and 2006

	Capital cities		Balance of state		All	
	2001	**2006**	**2001**	**2006**	**2001**	**2006**
Areas persistently at high risk of child social exclusion	SLAs=36		SLAs=174		SLAs=210	
Proportion children in sole parent families	0.26	0.27	0.27	0.28	0.27	0.28
Proportion children in families with no family Year 12	0.35	0.30	0.40	0.34	0.38	0.32
Proportion children with highest parental occupation blue collar	0.26	0.25	0.22	0.21	0.24	0.23
Proportion children living in public housing	0.15	0.12	0.15	0.14	0.15	0.13
Proportion children with neither parent working	0.31	0.29	0.29	0.26	0.30	0.27
Proportion children in families with no motor vehicle	0.08	0.08	0.11	0.10	0.09	0.09
Proportion children in families with low income	0.29	0.31	0.31	0.31	0.30	0.31
Areas persistently at low risk of child social exclusion	**2001**	**2006**	**2001**	**2006**	**2001**	**2006**
	SLAs = 103		SLAs=23		SLAs=126	
Proportion children in sole parent families	0.12	0.12	0.12	0.11	0.12	0.12
Proportion children in families with no family Year 12	0.09	0.07	0.15	0.11	0.09	0.07
Proportion children with highest parental occupation blue collar	0.08	0.07	0.15	0.13	0.08	0.07
Proportion children living in public housing	0.02	0.01	0.02	0.01	0.02	0.01
Proportion children with neither parent working	0.08	0.08	0.08	0.07	0.08	0.08
Proportion children in families with no motor vehicle	0.02	0.02	0.01	0.01	0.02	0.02
Proportion children in families with low income	0.08	0.09	0.11	0.10	0.08	0.09
Average characteristics of SLAs included in modelling	**2001**	**2006**	**2001**	**2006**	**2001**	**2006**
	SLAs = 318		SLAs=727		SLAs=1045	
Proportion children in sole parent families	0.18	0.18	0.21	0.22	0.19	0.19
Proportion children in families with no family Year 12	0.21	0.17	0.31	0.25	0.25	0.20
Proportion children with highest parental occupation blue collar	0.17	0.16	0.20	0.19	0.18	0.17
Proportion children living in public housing	0.06	0.05	0.08	0.07	0.07	0.05
Proportion children with neither parent working	0.17	0.15	0.20	0.18	0.18	0.16
Proportion children in families with no motor vehicle	0.04	0.04	0.06	0.05	0.05	0.04
Proportion children in families with low income	0.17	0.17	0.23	0.22	0.19	0.19

Note: Proportions of children with particular characteristics are calculated as a proportion of all children within the total population of children living in a particular set of small areas. Data related to family education levels may be affected by changes to the Census data for this variable between 2001 and 2006.

Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

3.6 Moving up: areas which moved out of high child social exclusion risk between 2001 and 2006

While the overall tendency was for small areas to maintain their status in the two highest risk deciles across the five year period studied here, a number of small areas which were in the highest areas of child social exclusion risk in 2001 did move up in the decile rankings by 2006. A number of these small areas were the subject of boundary changes between 2001 and 2006. As noted in the methodology section, this may mean that apparent changes in child social exclusion risk in such areas may be in whole or part an artefact of the boundary changes, rather than a reflection of true changes in characteristics. Therefore, when examining those small areas that moved up from the highest risk deciles of social exclusion risk in 2001 to lower risk deciles in 2006, we have excluded from our analysis any small areas affected by boundary changes. This left 28 small areas (11 capital city and 17 rural and regional) for analysis, and the characteristics of these areas in 2001 and 2006 are shown in Table 8. For the purposes of comparison, average characteristics of all small areas included in the modelling are also provided in Table 8.

Across many dimensions of social exclusion included in our modelling, those small areas which moved out of the two deciles of highest risk experienced substantially larger decreases in the proportion of children living in families with risk-related characteristics than was the average case. As shown in Table 8, the proportion of children living in single parent families fell (particularly in rural areas), for those small areas that moved up in ranking in 2006 — while this figure was stable on average for capital city areas and actually rose on average in rural areas. Similarly, although the proportion of children in jobless families and families with low levels of education dropped on average across the period, these proportions fell more sharply in those small areas which moved out of the bottom two deciles. Falls in the proportion of children in low income families were particularly strong in rural small areas which moved out of the bottom two deciles (27 per cent in 2001 compared with 23 per cent in 2002). Differences between those SLAs which moved out of the bottom decile and the average for all SLAs were less marked in relation to the occupation, public housing and motor vehicle variables.

It is interesting to contrast the characteristics of those small areas which moved out of the bottom two deciles with those that remained persistently high risk across the five year period (as shown above in Table 7). Figures 7 and 8 compare two of the major drivers of social exclusion risk – parental joblessness and family education - for persistently high risk and persistently low risk areas with data from those small areas which moved out of the highest risk deciles in 2006, and with the average for all small areas. Unsurprisingly, the proportions of children with high-risk

characteristics were generally larger in the persistently high risk small areas than in those small areas which moved out of the bottom two deciles, even in the base year of 2001. For example, 30 per cent of children living in persistently high risk small areas in 2001 were living in jobless families, compared to 26 per cent for those small areas that subsequently moved out of the bottom decile (as shown in Figure 8). Figures 7 and 8 demonstrate not only that those small areas which moved out of the highest risk deciles by 2006 had lower proportions of children with the high risk characteristics shown in these charts than persistently high risk areas, but also that these areas experienced somewhat greater falls in the proportions of high risk characteristics between 2001 and 2006 than was the case for the other groups of small areas shown. In addition, as shown in Tables 7 and 8, areas that moved up in 2006 had substantially lower proportions of children living in public housing or in families with low incomes than in persistently high risk small areas.

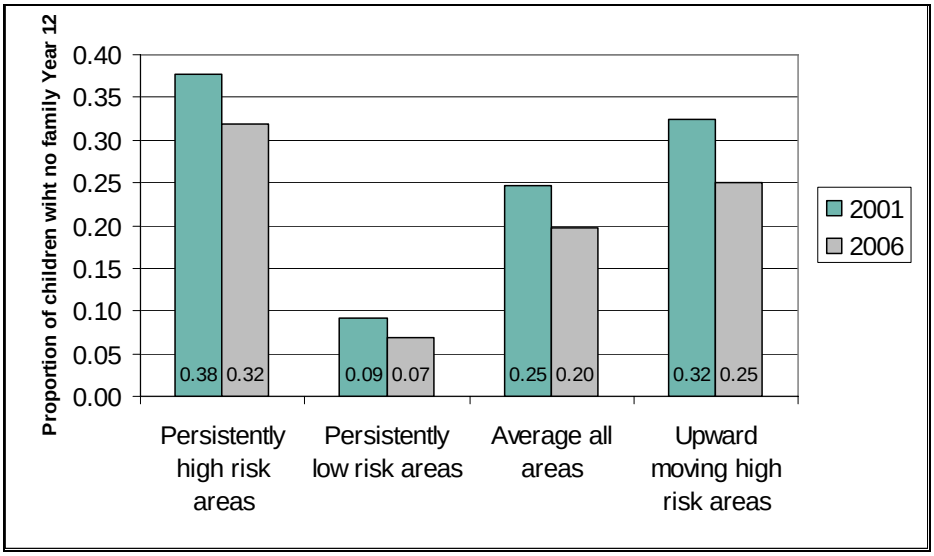
Table 8 Characteristics of small areas which moved out of bottom two deciles of child social exclusion risk and characteristics of all modelled small areas, 2001 and 2006

Characteristics of SLAs which moved out of bottom quintile from 01 to 06 and not subject to boundary changes	Capital cities		Balance of state		All	
	2001	**2006**	**2001**	**2006**	**2001**	**2006**
	SLAs=11		SLAs=17		SLAs=38	
Proportion children in sole parent families	0.25	0.24	0.25	0.23	0.25	0.24
Proportion children in families with no family Year 12	0.32	0.25	0.35	0.27	0.32	0.25
Proportion children with highest parental occupation blue collar	0.23	0.22	0.24	0.23	0.23	0.22
Proportion children living in public housing	0.10	0.07	0.07	0.05	0.09	0.07
Proportion children with neither parent working	0.26	0.20	0.25	0.18	0.26	0.20
Proportion children in families with no motor vehicle	0.06	0.05	0.05	0.03	0.06	0.04
Proportion children in families with low income	0.24	0.22	0.27	0.23	0.25	0.22
Average characteristics of SLAs included in modelling	**2001**	**2006**	**2001**	**2006**	**2001**	**2006**
	SLAs = 318		SLAs=727		SLAs=1045	
Proportion children in sole parent families	0.18	0.18	0.21	0.22	0.19	0.19
Proportion children in families with no family Year 12	0.21	0.17	0.31	0.25	0.25	0.20
Proportion children with highest parental occupation blue collar	0.17	0.16	0.20	0.19	0.18	0.17
Proportion children living in public housing	0.06	0.05	0.08	0.07	0.07	0.05
Proportion children with neither parent working	0.17	0.15	0.20	0.18	0.18	0.16
Proportion children in families with no motor vehicle	0.04	0.04	0.06	0.05	0.05	0.04
Proportion children in families with low income	0.17	0.17	0.23	0.22	0.19	0.19

Note: Proportions of children with particular characteristics are calculated as a proportion of all children within the total population of children living in a particular set of small areas. Data related to family education levels may be affected by changes to the Census data for this variable between 2001 and 2006.

Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

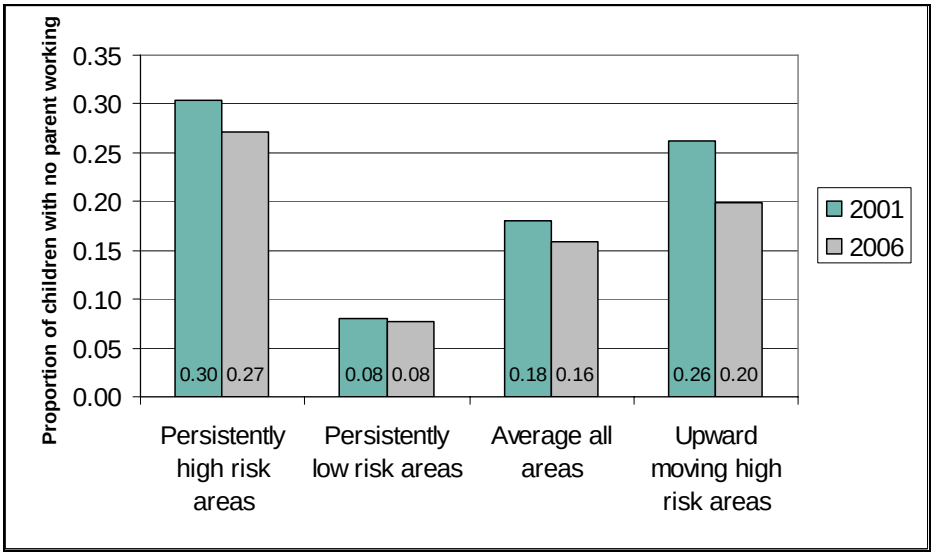
Figure 7 Changes in education level of family, children 0 – 15 years, 2001 and 2006



Note: Data related to family education levels may be affected by changes to the Census data for this variable between 2001 and 2006.

Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

Figure 8 Changes in parental joblessness, children 0 – 15 years, 2001 and 2006



Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

3.7 Moving down: geographical concentrations of child social exclusion risk

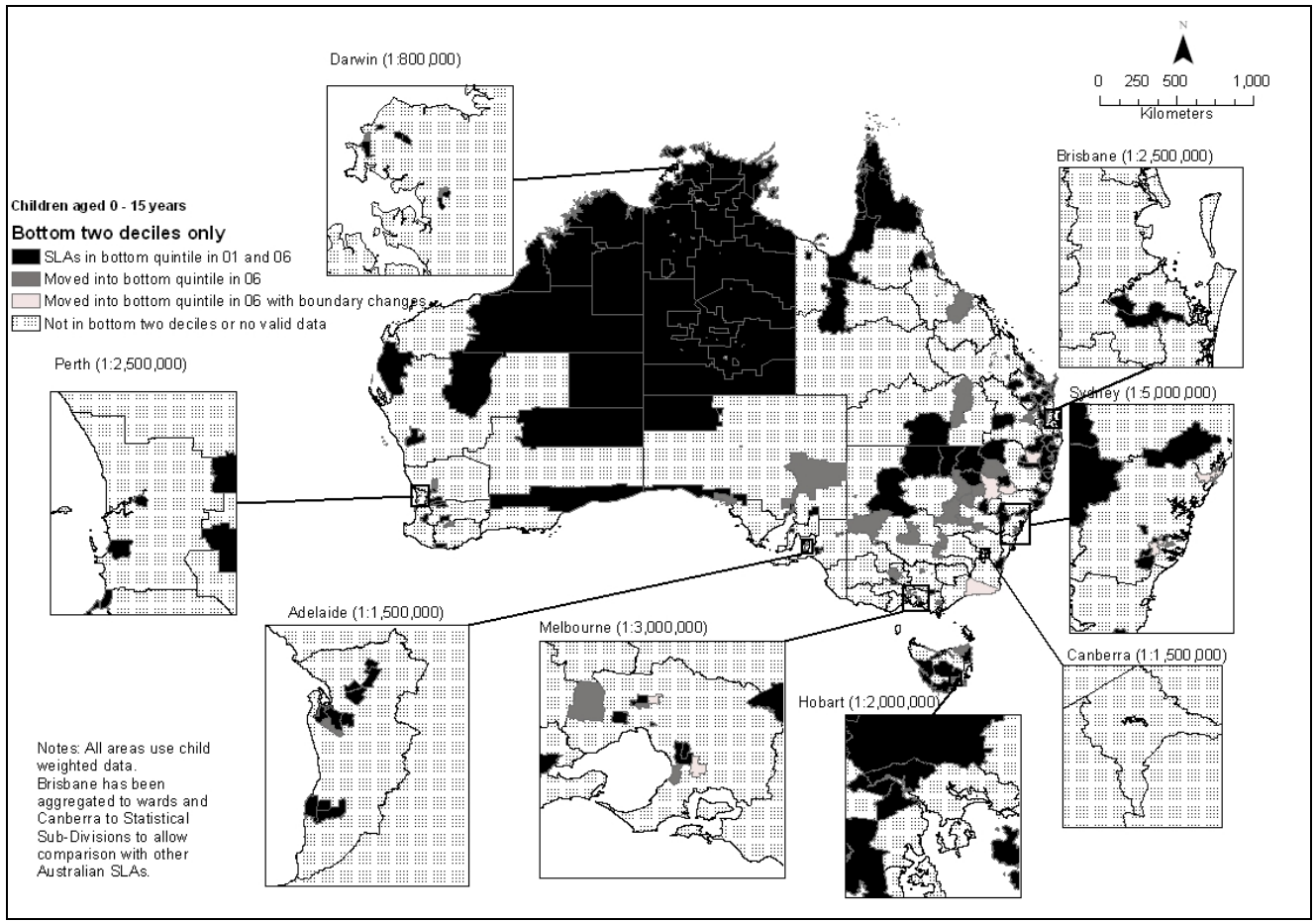
The analysis above focuses on those small areas which remained persistently at high risk of child social exclusion between 2001 and 2006, and on those areas which moved out of the highest social exclusion risk group over that period. This final section examines geographic patterns which emerge when we map 'downward movers' — those small areas which moved down into the bottom two deciles of child social exclusion risk between 2001 and 2006. Of interest is whether these new entrants into the highest risk group are geographically adjacent to existing high risk areas, suggesting an increasing geographic concentration of child social exclusion risk.

Figure 9 shows those small areas which were persistently in the bottom two deciles of child social exclusion risk in 2001 and 2006 (the darkest colour on the map), and those areas which moved into the bottom two deciles of child social exclusion risk between 2001 and 2006, and which were not affected by boundary changes (the mid colour). Those SLAs which moved into the bottom two deciles of social exclusion risk, but which were also affected by boundary changes between 2001 and 2006, are shown separately on the map as the lightest colour because, as noted earlier, boundary changes may affect the apparent distribution of child social exclusion risk. Stippled areas are those which were not in the bottom two deciles of risk in 2006, or for which no valid data were available.

Figure 9 clearly shows substantial areas of persistent high risk of exclusion, most notably in Australia's remote north, in Hobart, along the mid-north east coast and at the fringes of most capital cities. In several of the capital cities, no new small areas entered the bottom two deciles of child social exclusion risk in 2006 and, in Sydney and Melbourne, movements into the bottom decile are difficult to interpret due to a number of small areas being affected by boundary changes. However, a number of SLAs unaffected by boundary changes in northern New South Wales and Queensland's populous mid-coast and mid-coast hinterland moved into the bottom two deciles in 2006.

In order to further analyse patterns of child disadvantage in growing clusters of high social exclusion risk, we have selected the New South Wales cluster to examine in more detail. Characteristics of this cluster of high risk small areas are shown in Table 9, with both the persistently high risk small areas and those areas which moved into the bottom decile (except those which were the subject of boundary changes) included in our calculations.

Figure 9 Bottom two deciles of child social exclusion risk, 2006



Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

As can be seen in Table 9, the cluster of NSW small areas showed particularly sharp growth in the percentage of children living in single parent families and an increase in the proportion of children living in jobless families. This latter finding is particularly noteworthy given the overall substantial fall in family joblessness, even in persistently high risk small areas.

Table 9 Characteristics of expanding cluster of NSW small areas in bottom two deciles of child social exclusion risk by 2006

	2001	2006
Characteristic	SLAs=13	
Proportion children in sole parent families	0.23	0.27
Proportion children in families with no family Year 12	0.40	0.34
Proportion children with highest parental occupation blue collar	0.20	0.17
Proportion children living in public housing	0.14	0.13
Proportion children with neither parent working	0.25	0.26
Proportion children in families with no motor vehicle	0.11	0.11
Proportion children in families with low income	0.30	0.31

Note: Data related to family education levels may be affected by changes to the Census data for this variable between 2001 and 2006.

Data source: ABS Census of Population and Housing 2001, 2006; authors' calculations

4 Conclusion

Overall, our findings show a strong tendency for social exclusion risk to persist in small areas across time, with the vast majority of those areas which were in the highest risk group in 2001 remaining in that category in 2006. Persistently high risk areas, unsurprisingly, had higher proportions of children with the characteristics we used to create the Child Social Exclusion index, with striking differences in these characteristics between the lowest risk and highest risk areas. However, there was some evidence to suggest that, on some indicators, the gap between the highest risk and lowest risk areas might have narrowed slightly over the five year period studied, although this pattern was not evident for all characteristics.

Despite this overall pattern of persistence of risk, some small areas did move into and out of the highest risk deciles between 2001 and 2006. When we analysed changes in the characteristics of those areas which moved out of the highest risk deciles between 2001 and 2006, we found that these areas generally had somewhat

lower proportions of high risk characteristics in the base 2001 period, and that many of these proportions fell more sharply in these areas than in other areas across the period. Identifying clusters of increasing social exclusion risk was difficult, due to the possible effects of small area boundary changes, but our examination of a rural cluster in which additional areas of high risk appeared between 2001 and 2006 showed substantial increases in the proportions of children with high risk factors in these areas.

When examining differences in child social exclusion risk between capital city and non-capital city children, we found that while rural children still faced the highest risk of child social exclusion in 2006, the gap in risk between urban and rural children had reduced between 2001 and 2006. However, the tendency for almost all of the lowest risk areas to fall into capital city rather than rural and regional areas did not change across the five year period. In addition, the increasing risk of child social exclusion for capital city children in 2006 may have been affected by small area boundary changes across the period.

Our results suggest that substantial geographic differences in child social exclusion risk exist across Australia, and that the risk tends to persist within areas. However, our findings also demonstrate that in some areas positive change has occurred, and further investigation into the sources of such change, and the extent to which such change could be reproduced in other areas, would be fruitful avenues for future enquiry.

References

ABS (2003) *Socio-Economic Indexes for Areas: Information Paper*, Cat. No. 2039.0. ABS: Canberra.

ABS (2007a) *Household income and income distribution, Australia, 2005-06*, Cat. No. 6523.0, ABS: Canberra.

ABS (2007b) *Education and Work, Australia, May 2007*, Cat. No. 6227.0, Additional datacubes, available at *http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6227.0May%202007?OpenDocument*

ABS (2008) *Labour Force Australia, 2008*, Cat No. 6202.0.55.001, ABS: Canberra

ACOSS (2008) 'Targeting Fairness, setting targets for social inclusion', background discussion paper for ACOSS Social Inclusion Conference, April.

Annie E Casey Foundation (2008) *Kids Count*, available on the web at www.aecf.org

Atkinson, A., Cantillon, B., Marlier, E., and Nolan, B. (2002) *Social Indicators; The EU and Social Exclusion,* Oxford University Press: Oxford.

Australian Institute of Health and Welfare (AIHW) (2007) *Aboriginal and Torres Strait Islander Health Performance Framework, 2006 Report, detailed analyses*, AIHW Cat No. 20, AIHW: Canberra.

Australian Institute of Health and Welfare (AIHW) (2008) 'Key National Indicators of Children's Health, Development and Wellbeing', Bulletin, Canberra, available on the web at www.aihw.gov.au.

Australian Labor Party (2007) 'An Australian social inclusion agenda', available on the ALP web site at www.alp.org.au/policy

Barnes, H. Wright, G. Noble, M. and Dawes, A. (2007) *The South African Index of Multiple Deprivation for Children 2001*, Cape Town Human Sciences Research Council.

Baum, S., O'Connor, K. and Stimson, R. (2005) *Fault Lines Exposed: Advantage and Disadvantage across Australia's Settlement System*. Monash University ePress: Clayton, Victoria.

Bradbury, B. (2003) 'Child Poverty: a Review, Commonwealth Department of Family and Community Services', Policy Research Paper, no. 20, Canberra.

Bradshaw, J. Kemp, P., Baldwin, S. and Rowe, A. (2004) 'The Drivers of Social Exclusion. A review of the literature for the Social Exclusion Unit in the Breaking the Cycle Series', the Social Exclusion Unit, Office of the Deputy Prime Minister, UK, available on the web at http://www.socialexclusion.gov.uk

Bradshaw, J. Hoelscher, P. and Richardson, D. (2006) 'Comparing child well-being in OECD countries: concepts and methods', Innocenti Working Paper IWP -2006-03, UNICEF.

Bradshaw, J. Hoelscher, P. and Richardson, D. (2007) 'An index of child well-being in the European Union', *Social Research Indicators, Vol. 80*, 133-177.

Brown, E. and Ferris, J. (2004) *Social capital and philanthropy*. International Society for Third Sector Research, Toronto, Canada, July.

Burchardt, Le Grand, J and Piachaud, D (2002) 'Degrees of exclusion: developing a dynamic, multidimensional measure' in eds Hills, J., Le Grand, J, and Piachaud, D *Understanding Social Exclusion*, Oxford University Press: Oxford.

Childstats (2008) 'America's children: key national indicators of well-being, 2007', available on the web at www.childstats.gov.

Commonwealth of Australia Senate Community Affairs Reference Committee (2004) 'A Hand Up not a Hand Out: Renewing the Fight Against Poverty, Report on poverty and financial hardship', Commonwealth of Australia, available on the web at www.aph.gov.au/senate/committee/

Daly, A., McNamara, J. Tanton, R. Harding, A. and Yap, M. (2008), 'Indicators of social exclusion for Australia's children: an analysis by State and age group', *Australasian Journal of Regional Studies, vol. 14*, no. 3 (in press) (earlier version available on NATSEM website as a conference paper)

European Commission (2005) 'Regional indicators to reflect social exclusion and poverty', Policy Studies Findings 4, European Communities available on the web at http://europa.eu.int/comm/employment_social/social_inclusion/studies_en.htm.

Frazer, H. and Marlier, E. (2007) 'Tackling child poverty and promoting the social inclusion of children in the EU', Synthesis Report available on the web at http://europa.eu.int/comm/employment_social/social_inclusion/

Glaeser, E. L., Laibson, D. and Sacerdote, B. (2002) 'An Economic Approach to Social Capital'. *Economic Journal, 112(483),* 437–458.

Harding, A. McNamara, J., Tanton, R., Daly, A. and Yap, M. (2006) 'Poverty and disadvantage among Australian children: a spatial perspective', Paper presented at the 29th General Conference of the International Association for Research in Income and Wealth, Joensuu, Finland, 20-26 August.

Headey, B. and Wooden, M. (2005) 'Income, Wealth and Joblessness: Insights from the HILDA Survey', paper presented to the conference Sustaining Prosperity – the 2005 Melbourne Institute Economic and Social Outlook Conference, 31 March-1 April. UPDATE

Headey, B. Marks G. and Wooden M. (2005) 'The dynamics of income poverty in Australia: evidence from the first three waves of the HILDA survey', *Australian Journal of Social Issues, Vol. 40, no. 4 Summer,* 541-552.

Land, K.C., Lamb, V.L., Meadows, S.O. and Taylor, A. (2007) 'Measuring trends in child well-being: an evidence-based approach'. *Social Indicators Research, 80*, 105-132.

Land, K. and Crowell, J. (2008) 'The Child and Youth Well-Being Index 2007', available on the web at www.soc.duke.edu/~cwi/.

Noble, M., Smith, G., Wright, G. Dibben, C. and Lloyd, M. (2001) 'The Northern Ireland Multiple Deprivation Measure 2001', Occasional Paper No. 18, Belfast: Northern Ireland Statistics and Research Agency.

Noble, M., Wright, G., Dibben C., Smith, G. McLennan, D. Anttila, C. Barnes, H. Mokhtar, C., Noble, S., Avenell, D., Gardner, J., Covizzi, I., and Lloyd, M. (2004) 'The English Indices of Deprivation 2004', London: Office of the Deputy Prime Minister.

Salmond, C. and P. Crampton. (2002) 'NZDep2001 Index of Deprivation'. Wellington, Department of Public Health, Wellington School of Medicine and Health Sciences.

Saunders, P. (2007) 'Identifying the essentials of life, Towards New Indicators of Disadvantage', Project Bulletin no. 1, SPRC, University of New South Wales, available on the web at www.sprc.unsw.edu.au

Saunders, P. Naidoo, Y. and Griffith, M. (2007) 'Towards new indicators of disadvantage: deprivation and social exclusion in Australia', Bulletin no. 1, SPRC, UNSW, available on the web at www.sprc.unsw.edu.au

Saunders P. and Naidoo, Y. (2008) 'Social exclusion and children', Bulletin no. 4, SPRC, UNSW, November, available on the web at www.sprc.unsw.edu.au

Scutella, R. and Smyth, P. (2005) 'The Brotherhood's Social Barometer', Brotherhood of St Laurence: Fitzroy, Victoria.

Smeeding, T. (2006) 'Poor people in rich nations: the United States in comparative perspective', *Journal of Economic Perspectives, vol. 20 no. 1, winter,* pp69-90.

Stanley, F. Richardson, S. and Prior, M. (2005) *Children of the Lucky Country?* MacMillan: Sydney.

SCRGSP (Steering Committee for the Review of Government Service Provision) (2007) 'Overcoming Indigenous Disadvantage: Key Indicators 2007', Productivity Commission: Canberra.

Tanton, R., Harding, A. Daly, A. McNamara, J. and Yap, M. (2008) 'Australian children at risk of social exclusion: a spatial index for gauging relative disadvantage', *Population, Space and Place, Vol 14,* forthcoming.

UNICEF (2005) 'Child Poverty in Rich Countries 2005, Report Card no. 6', UNICEF, Innocenti Research Centre, Florence, Italy.

UNICEF (2007) 'An overview of child well-being in Rich Countries 2005', Report Card no. 7, UNICEF, Innocenti Research Centre, Florence, Italy.

Vinson, T (2001) *Unequal in Life, The Distribution of Social Disadvantage in Victoria and NSW*, Jesuit Social Services, Ignatius Centre for Social Policy and Research: Melbourne.

Vinson, T. (2007) *Dropping off the Edge: the distribution of disadvantage in Australia,* Jesuit Social Services and Catholic Social Services Australia: Victoria.

Vu, Q N, Harding, A and Percival, R (2008) 'A growing gap? Trends in economic wellbeing at the top of the spectrum in Australia'. Paper for presentation at 30th General Conference of the International Association for Research on Income and Wealth, Portoroz, Slovenia, 29 August 2008.

Vu, Q N, Harding, A, Tanton, R, Nepal, B and Vidyattama, Y, (2008) 'Advance Australia Fair: : Trends in small area socio-economic inequality, 2001 to 2006', AMP.NATSEM Income and Wealth Report, Issue No 20, July 2008 (available from www.amp.com.au/ampnatsemreports)