



National Centre for Social and Economic Modelling
• University of Canberra •

Rich suburbs, poor suburbs? Small area poverty estimates for Australia's eastern seaboard in 2006

**Robert Tanton, Justine McNamara, Ann Harding and
Thomas Morrison**

**Paper for the 1st General Conference of the
International Microsimulation Association
20-21 August 2007**

About NATSEM

The National Centre for Social and Economic Modelling was established on 1 January 1993, and supports its activities through research grants, commissioned research and longer term contracts for model maintenance and development with a wide range of Federal and State government agencies.

NATSEM aims to be a key contributor to social and economic policy debate and analysis by developing models of the highest quality, undertaking independent and impartial research, and supplying valued consultancy services.

Policy changes often have to be made without sufficient information about either the current environment or the consequences of change. NATSEM specialises in analysing data and producing models so that decision makers have the best possible quantitative information on which to base their decisions.

NATSEM has an international reputation as a centre of excellence for analysing microdata and constructing microsimulation models. Such data and models commence with the records of real (but unidentifiable) Australians. Analysis typically begins by looking at either the characteristics or the impact of a policy change on an individual household, building up to the bigger picture by looking at many individual cases through the use of large datasets.

It must be emphasised that NATSEM does not have views on policy. All opinions are the authors' own and are not necessarily shared by NATSEM.

Director: Ann Harding

© NATSEM, University of Canberra 2007

National Centre for Social and Economic Modelling
University of Canberra ACT 2601 Australia
170 Haydon Drive Bruce ACT 2617

Phone + 61 2 6201 2780 Fax + 61 2 6201 2751

Email natsem@natsem.canberra.edu.au

Website www.natsem.canberra.edu.au

Abstract

There is increasing interest in Australia and internationally about geographic differences in advantage and disadvantage. This paper describes the use of spatial microsimulation techniques to examine differences in income poverty at a small area level in New South Wales, Victoria, Queensland and the Australian Capital Territory. The spatial microsimulation methodology used in this study involves reweighting data from income surveys to small area benchmarks derived from the Australian census. This paper provides details of this methodology, along with some initial results demonstrating substantial geographic differences in the distribution of income poverty. The paper concludes by outlining future extensions to this work.

Author note

Robert Tanton is a Principal Research Fellow, Justine McNamara is a Senior Research Fellow, Thomas Morrison is a Research Fellow at the National Centre for Social and Economic Modelling (NATSEM) at the University of Canberra. Ann Harding is Professor of Applied Economics and Social Policy and NATSEM's Director.

Acknowledgments

This study was funded under ARC project DP664429: *Opportunity and Disadvantage: Differences in Wellbeing Among Australia's Adults and Children at a Small Area Level*. The authors would also like to acknowledge the efforts of the many past and present NATSEM staff who have contributed to the development of the spatial microsimulation techniques critical to this study. They include: Anthea Bill, Marcus Blake, Susan Day, Anthony King, Stephen Leicester, Rachel Lloyd, Tony Melhuish, Binod Nepal, Ben Phillips, Shih-Foong Chin and Elizabeth Taylor.

General caveat

NATSEM research findings are generally based on estimated characteristics of the population. Such estimates are usually derived from the application of microsimulation modelling techniques to microdata based on sample surveys.

These estimates may be different from the actual characteristics of the population because of sampling and nonsampling errors in the microdata and because of the assumptions underlying the modelling techniques.

The microdata do not contain any information that enables identification of the individuals or families to which they refer.

1 Background

There is increasing interest within Australia about the extent to which benefits of the economic boom over the past decade may not have been evenly distributed among all Australians. One focus of this interest has been the examination of geographic differences in advantage and disadvantage, with a growing body of work examining aspects of disadvantage at a small area level. This includes work by Baum and colleagues focusing on multiple measures of socio-economic disadvantage (Baum, O'Connor and Stimson 2005), and Vinson's (2001; 2004; 2007) work on small area estimates of disadvantage, social cohesion and resilience. A series of studies by Gregory and Hunter (Gregory and Hunter 2001; Hunter 1995; Hunter 2003) use census data to map regional disparities in advantage and disadvantage within Australia's cities. Regional differences in housing affordability and the impact of housing assistance have also been studied (Melhuish, King and Taylor 2004; Taylor et al 2004), along with spatial trends in income inequality (Harding et al, 2004).

This study focuses on regional differences in income poverty, and builds on earlier work by NATSEM examining this issue (see Lloyd, Harding and Greenwell 2001; Chin, Harding and Tanton 2006, Harding et. al, 2006). Poverty has been difficult to study at a small area level in Australia due to a lack of suitable data. The Australian Census of Population and Housing (which forms the primary basis for many small area studies) collects income information, but not in a way that is suitable for the measurement of income poverty. The usual method of measuring income poverty, within Australia and internationally, is to calculate disposable income (that is, income inclusive of cash transfers and net of income tax), apply an equivalence scale to that income so as to take account of differences in household size and composition, and then set a poverty line at some level of equivalent disposable income (in Australia usually 50 per cent of the median equivalised income, but internationally more often 60 per cent of this amount). The census provides only gross income, with no information about income tax, and provides this income measure only in ranges, not actual dollar figures.

In this study, we overcome these data deficiencies by using spatial microsimulation techniques to produce synthetic estimates of income poverty at a small area level. We have used these techniques (described below) to produce earlier estimates of poverty (see Lloyd, Harding and Greenwell 2001; Chin, Harding and Tanton 2006), but in this paper we use updated methodology and more recent data to produce synthetic small area poverty rates for 2006. In this paper, we present results only for the four states and territories along Australia's eastern seaboard, which together make up approximately 79 per cent of Australia's total population

The remainder of this paper is arranged as follows. Section 2 provides details of the methodology used to produce our poverty estimates, and Section 3 presents results from the modelling. Section 4 summarises the material presented in this paper, and discusses work still to be done.

2 Methodology

2.1 Spatial microsimulation

The results presented in this paper are produced using a spatial microsimulation model developed by NATSEM. Spatial microsimulation techniques provide small area data that may not be available from other sources, and also incorporate the ability to model the impact of policy changes at a small area level (Melhuish, Blake and Day 2002; Chin et. al. 2005). A number of techniques exist to conduct spatial microsimulation. Our work uses a reweighting technique, which involves creating a set of weights representing synthetic households for each small area being modelled. These weights are then applied to a poverty flag variable generated using the equivalised disposable household income in STINMOD, NATSEM's national microsimulation model of Australia's tax and social security system (Lloyd, 2007). If the equivalised disposable household income is less than half the Australian median then the poverty flag is set to one; otherwise it is zero. This process produces estimates of the number and proportion of persons in income poverty for each small area included in the modelling.

Details of the development of the spatial microsimulation methodology at NATSEM have been reported at length elsewhere (see, for example, Chin and Harding 2006, 2007; Melhuish, Blake and Day 2002; Melhuish, King and Taylor 2004). Here, we will describe the major steps that are involved in the production of the synthetic poverty estimates produced for this paper, and will note the changes introduced to the modelling for these estimates compared with earlier NATSEM regional poverty estimates (reported in Lloyd, Harding and Greenwell 2001 and Chin, Harding and Tanton 2006).

Producing regional weights

The first step in producing regional poverty estimates involves combining information from two sources – the Australian Census of Population and Housing 2001, and data from the most recent income surveys conducted by the Australian

Bureau of Statistics. The census, as noted earlier, has insufficient information to produce poverty rates, but includes variables that broadly relate to poverty at a very detailed regional level. The Survey of Income and Housing Costs, on the other hand, provides the detailed information about income needed to calculate income poverty, but at a very low level of spatial disaggregation. To produce a set of household weights for each small area included in the modelling, we benchmark the Survey of Income and Housing Costs to the census, using variables that are available in both data sources. The census benchmark variables used to produce the regional estimates for this study are shown in Table 1.

Table 1 Benchmarks used in the reweighting algorithm

Census XCP ⁽¹⁾ table

X46b Income By Tenure By Household Type

X13 Labour Force Status by Sex and Age

X44 Landlord Type By Weekly Rent

X46b Income By Tenure By Household Type

X46 Income By Tenure By Household Type

X45 Type of non-private dwelling

X41 Monthly Housing Loan Repayment by Weekly Household Income

X47 Dwelling Structure by Household Type by Family Type

X48 Number of persons usually resident

X40 Wkly Rent by Wkly Household Income

Note: (1) XCP refers to the Census 2001 Expanded Community Profile Tables

For this study, we combine data from two separate years of the Survey of Income and Housing Costs – 2002/03 and 2003/04. This is done to maximise our sample size, and thus improve our estimates of regional poverty. In order to combine these two separate survey years with 2001 Census data, we first merged the two income surveys, then converted all dollar amounts in each of these surveys to 2001 values. We then re-coded the benchmarking variables where necessary to ensure that data was categorised identically across the income surveys and the census. Finally, we used the GREGWT reweighting algorithm to reweight the combined income surveys using the census benchmark variables. The GREGWT algorithm is a generalised regression routine written in the SAS programming language, and developed by the ABS (ABS 2000). It conducts iterative calculations to derive an optimal set of

household weights for each SLA, using a regression approach to minimise the difference for each benchmark class between the census count and the estimated count. When the difference between the two counts – known as the residual – is at or close to zero, the iterations stop – a process known as convergence (Chin et al 2006). The output from the GREGWT run is a set of household weights for each SLA in Australia, with these weights closely matching the characteristics of households in each SLA as recorded in the census data.

GREGWT residuals (that is, the difference between the census count and the estimated count for each of the benchmark variables) for the vast majority of small areas in Australia are very small, and the household weights produced for these areas can then be used to calculate small area poverty rates and other regional characteristics associated with the benchmark variables. However, for some small areas, especially those with unusual characteristics or very small populations, the residuals are very large, and the algorithm does not converge. These small areas are then dropped from any further analysis. Table 2 shows each of the states and territories for which estimates are produced in this paper, and the number of non-convergent SLAs within each. While the ACT has a reasonably large percentage of non-convergent SLAs, these are almost all have either extremely low population, or very unusual characteristics (for example, they may consist entirely or almost entirely of military bases or universities). As shown in the final right hand column of Table 2, only a very small minority of households live in the SLAs for which we are not able to produce accurate results.

Table 2 Non-convergent SLAs

State/territory	Total number of SLAs	Number of non-convergent SLAs	Percent of non-convergent SLAs	Percent of all households in that State/Territory living in non-convergent SLAs
New South Wales	199	4	2.0%	2.1%
Victoria	200	6	3.0%	0.3%
Queensland	454	13	2.9%	0.4%
Australian Capital Territory	107	19	17.8%	0.9%

Source: ABS Census of Population and Housing 2001; Survey of Income and Housing Costs 2002/03; Survey of Income and Housing Costs 2003/04; authors' calculations

Applying the weights to the variable(s) of interest

The final steps in spatial microsimulation involve applying the set of household weights for each convergent SLA that has been produced by the GREGWT process to the variable or variables of interest – in this case, income poverty.

The most recent ABS survey data available to use as the basis for measuring income poverty is the 2003/04 Survey of Income and Housing Costs. In order to produce more recent estimates of income poverty, we used NATSEM's static microsimulation model of Australia's tax and social security system – STINMOD – to uprate incomes, cash transfer, and tax arrangements to December 2006. NATSEM's static microsimulation model – STINMOD – simulates the impact of major federal government cash transfers, income tax and the Medicare levy on individuals and families in Australia. STINMOD is used by the Australian Treasury, the Department of Families Community Services and Indigenous Affairs, and other government agencies, in policy formulation. (For additional information about STINMOD, see the STINMOD technical papers 1 to 7, available on the NATSEM website). The version of STINMOD used in this study (a modified version of STIN06/B) is a set of simulated unit records based on the same income surveys we used to produce our regional weights – the ABS Surveys of Income and Housing for 2002/03 and 2003/04.

As we wanted to model the regional distribution of income poverty as of 2006, we also needed to inflate our weights by projected population changes, as the set of weights produced through the reweighting process reflect small area populations in 2001. To do this, we applied a population uprating factor to each household weight within each SLA, using small area age by sex population projections produced by the ABS (ABS 2004). The ABS produces three series of population projections, each based on different assumptions about future levels of births, deaths and migration. We used the medium scenario (Series B) for the purposes of our population uprating.

Our final adjustment to the set of regional weights was to multiply each weight for each household for each SLA by the number of persons within that household (including children), so as to produce estimates of individuals in poverty, rather than households in poverty.

Using the STINMOD synthetic unit record dataset, we created a binary poverty flag variable for each household within this dataset (using a poverty definition and methodology described in the following section). Note that the STINMOD dataset covers the whole of Australia, not just the states and territory which we modelled at a regional level, so that the poverty flag variable was based on the distribution of incomes across the whole of Australia. We then applied our regional weights to this poverty flag variable, providing a final dataset which contained the estimated number and estimated proportion of people in poverty in each converging SLA in 2006. Our results (see Section 3) are presented as population-weighted deciles, with SLAs in the bottom quintile having the lowest proportions of people in poverty, and SLAs in the top quintile having the highest proportions of people in poverty. Because the quintiles are population-weighted, the SLAs in each quintile represent approximately one-fifth of persons living in SLAs within that decile, rather than one-fifth of SLAs. Note that this isn't exact, because if a break-point for a quintile

happens in a large SLA, the whole population of that SLA has to be assigned to the quintile, which means there may be more than 20 per cent of people in a quintile. Some of our results are also presented as population-weighted deciles, created using the same methodology as the quintiles.

It should be noted that some regions which, for example, show a low proportion of people in poverty, may nevertheless contain sub-groups of individuals who are experiencing a high level of poverty. These within-area differences are not able to be examined in the sort of geographical analysis undertaken here. However, the strength of spatial analysis is that it allows us to locate areas where there is a heavy concentration of income poverty.

2.2 Measurement of poverty

The definition and measurement of poverty is highly contested in Australia and internationally. There is no firm consensus among researchers or policy makers about the best way to define and measure poverty (see Harding et al 2001, McNamara et al 2006, and Saunders 2005 for a discussion of debates around these issues). In general, there has been a move in recent years towards multidimensional measures of poverty and disadvantage, based on a number of theoretical frameworks including Amartya Sen's concept of capabilities and the concept of social exclusion (see, for example, Headey 2005; Saunders 2005). However, it is widely acknowledged that headcount measures of income poverty, despite their deficiencies, continue to be an important part of assembling evidence about disadvantage, and a number of recent Australian studies use income poverty as a primary poverty measure (see, for example, Marks 2007; Saunders and Bradbury 2006).

A headcount poverty measure provides a straightforward, easily understood and widely accepted measure of disadvantage. As our focus in this study is on comparisons between regions, our priority is to use a consistent and well-understood measure of disadvantage.

Additional debates about the measurement of income poverty (relating, for example, to the quality of income data, and the correct place to draw the poverty line) are also ongoing, but as Marks (2007) notes, agreement has been reached about some issues. He notes that disposable income (that is, income after taxes and cash transfers) is viewed as the best measure of income to use for the calculation of poverty, and that this should be adjusted in some way for household size (Marks 2007, p. 2).

In this study, current disposable household income is used as the basis for measuring poverty. The use of household rather than individual income assumes income-sharing within households. The modified OECD equivalence scale (widely recognised internationally) is used to adjust these household incomes for household size and composition.¹ Persons are then ranked by their household incomes, and the poverty line is set at 50 per cent of the median equivalised household income, so that all persons with household income falling below this figure are deemed to be in poverty. Further details about the technical issues involved in the choice of income measure, equivalence scale and poverty line can be found in Greenwell, Lloyd and Harding (2001) and Saunders (2005).

In interpreting the results in this paper, it is important to be aware that income poverty is only one measure of disadvantage, and that headcount measures of poverty are very sensitive to definitional changes. It could be that using different measures of disadvantage, or using an alternative definition of poverty, could produce somewhat different spatial patterns to those shown here.

2.3 Spatial unit and geographic coverage

This study focuses only on the three states and one territory that make up the eastern section of Australia: New South Wales, Victoria, Queensland and the Australian Capital Territory (ACT). As noted earlier, these four regions make up about 79 per cent of the total Australian population, and the capital cities of the states are Australia's largest three cities. Work is continuing on developing up-to-date regional poverty estimates for Australia's remaining states and territories.

The primary spatial unit used in this study is the Statistical Local Area (SLA). There are 1,353 SLAs in Australia in the 2001 Australian Standard Geographical Classification (ASGC) (ABS 2001). SLAs vary substantially in population size, and in this study, focusing on the eastern seaboard states, SLAs in Brisbane and Canberra are generally smaller in population than those elsewhere. To partly overcome this problem, we present most of our results in population-weighted quintiles and deciles of poverty.

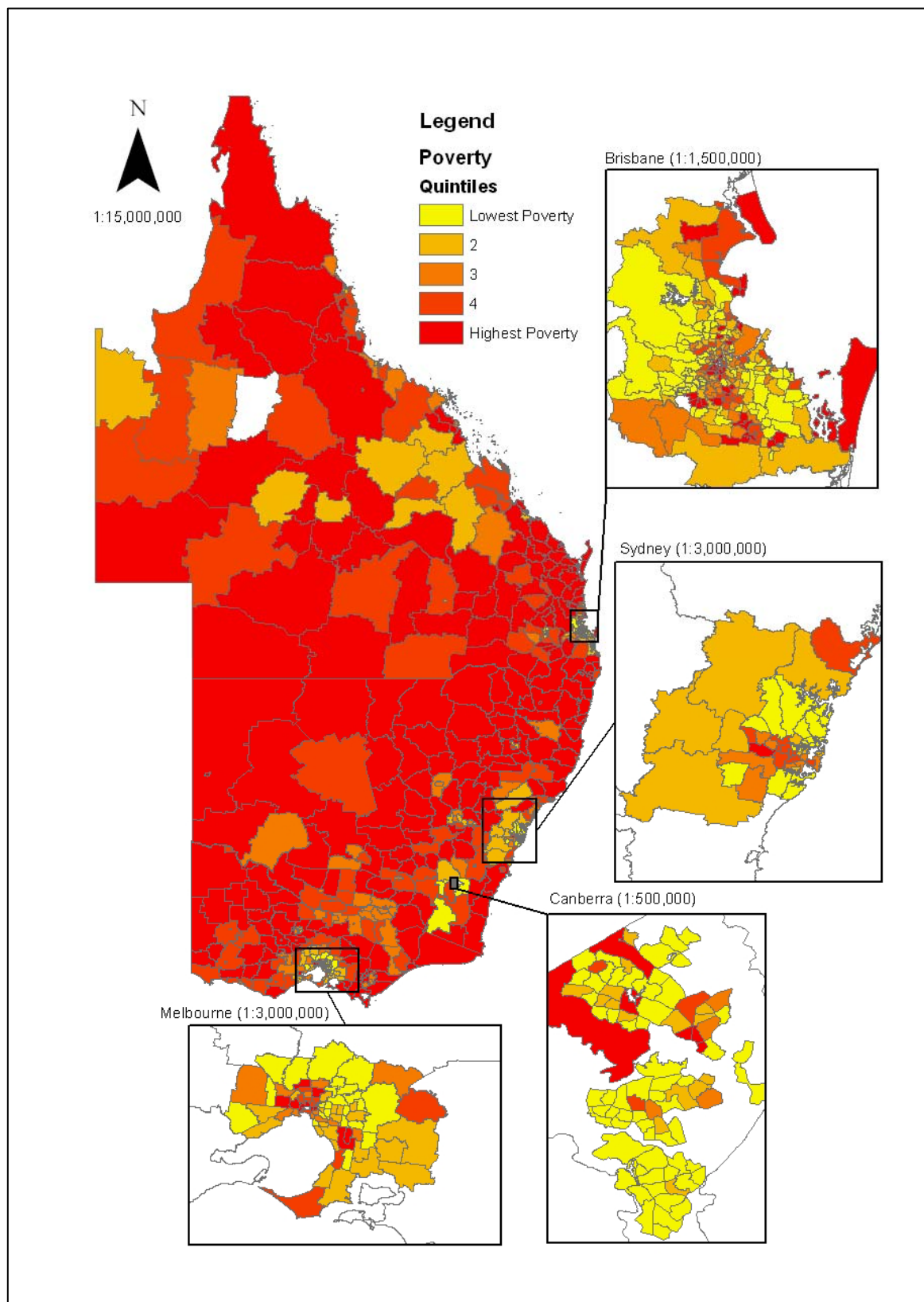
¹ In this study, this scale has been used to give a value of 1 to the first adult in the household, 0.5 to any second and subsequent adults, and 0.3 to dependent children (defined here are children aged 0 to 15, which differs from some earlier poverty research, in which full-time students living at home up to age 24 were sometimes also allocated the dependent child weight).

3 Results

Figure 1 shows the estimated distribution of poverty across Australia's eastern seaboard, using population-weighted quintiles of income poverty. The darkest colour on the map represents those areas where the proportion of people in poverty is in the top quintile. This map makes it clear that areas outside Australia's capital cities are more likely to have higher proportions of people in poverty than areas within capital cities. Large areas of rural NSW, western Victoria and south-eastern coastal regions fall into the top quintile of income poverty. Clusters of non-capital city areas showing lower rates of income poverty include areas in north Queensland to the west and south of Mackay (regions which include some mining towns), a large cluster of SLAs in south-eastern New South Wales and north-eastern Victoria, as well as the areas surrounding Sydney, Melbourne and Canberra.

While the capital cities generally have fewer top quintile SLAs, there are clusters of income-poor suburbs within these cities. For example, in Sydney the suburbs to the south-west of the city generally show higher rates of poverty than those to the north of the city. In Melbourne and Brisbane, there are several clusters of SLAs with relatively high rates of poverty. Canberra shows somewhat less variation than the other capital cities, and those areas that do show up on the Canberra map as being in the top poverty quintile are in fact areas of very low population.

Figure 1 Population weighted quintiles of poverty by SLA, 2006

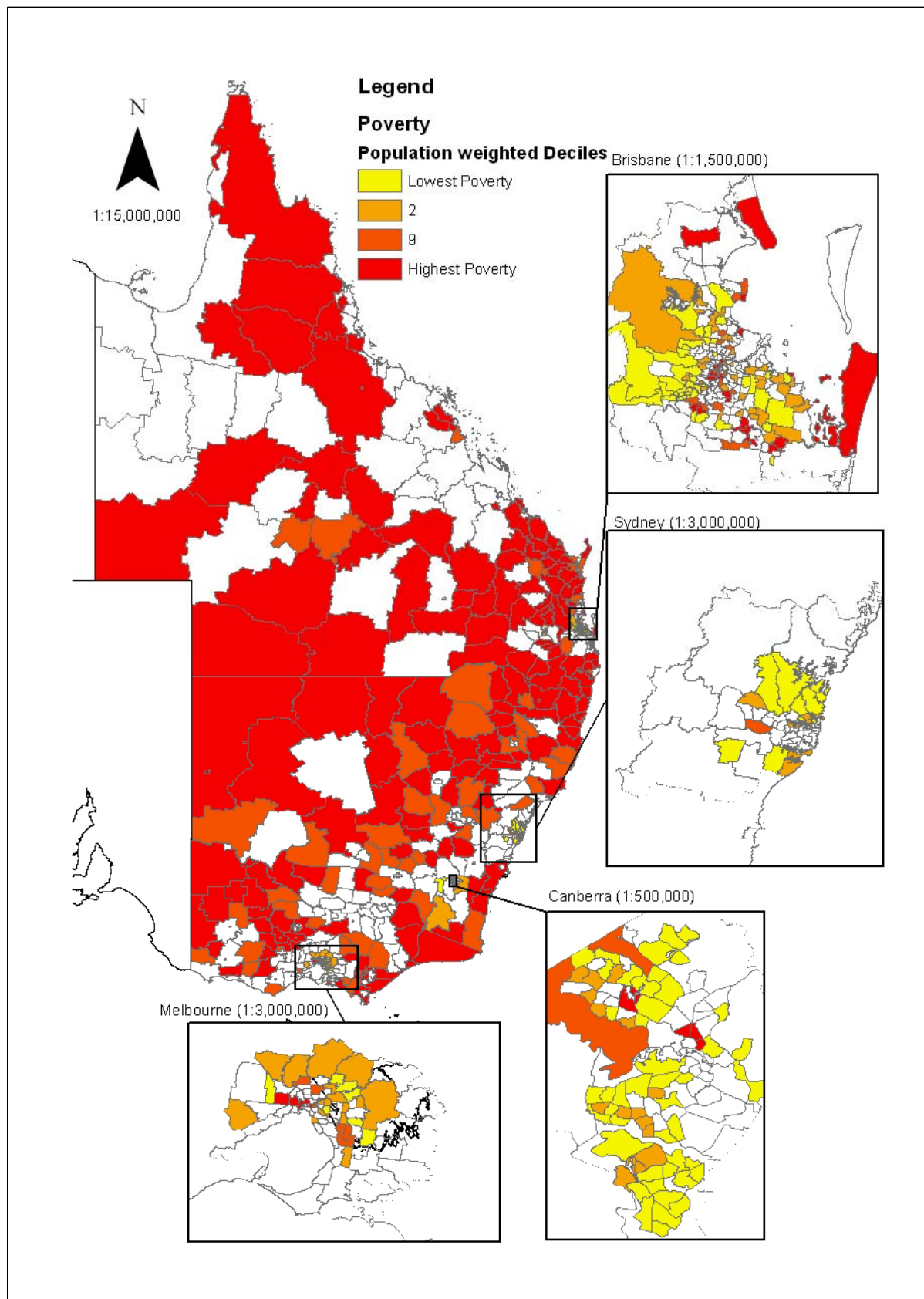


Data source: Authors' calculations

In order to examine regional variations in poverty further, and to examine geographical differences between areas of very low poverty and very high poverty, we calculated population-weighted deciles (rather than quintiles) of poverty. SLAs falling into the bottom two deciles (lowest proportions of persons in poverty) and those falling into the top two deciles (highest proportion of persons in poverty) are shown in Figure 2.

This map shows again the tendency for rural areas to have higher proportions of people living in poverty than major urban areas – and very few rural SLAs fall into the top two (least poor) deciles of income poverty. In the cities, more of a mix between relatively high and relatively low poverty areas is evident. For example, in Melbourne, there are a number of adjoining SLAs in which some small areas fall into the highest or second highest decile of income poverty, while others fall into the lowest or second lowest decile.

Figure 2 Population weighted deciles of poverty by SLA, 2006



Data source: Authors' calculations

While the maps shown above clearly demonstrate geographical differences in poverty, it is also important to understand the magnitude of the differences in advantage and disadvantage between areas. Table 3 provides this information, showing where the poverty rate within each decile falls as a proportion of the overall poverty rate for the SLAs included in the modelling. Recall that our deciles are population-weighted, and therefore are deciles of people, not deciles of SLAs. Thus some deciles contain much more than 10 per cent of the total number of SLAs, and some much less. While the number of persons in each decile is roughly 10 per cent of the total, this is not always the case as we cannot split SLAs across deciles, so that if a large SLA falls at the boundary of a decile, its total population will go into that grouping.

As shown in the table, the differences between poverty rates across deciles are substantial, with people living in SLAs in the least poor decile having a poverty rate of only around half of the overall average rate across New South Wales, Victoria, Queensland, and the ACT, compared to people living in SLAs in the poorest decile, where the poverty rate is over one and half times the average rate. When we examine ranges of poverty rates within deciles, these differences are even more marked, with the least poor SLA within the bottom decile have a poverty rate of only .14 of the mean rate, while the most poor SLA within the top decile has a poverty rate of over two and a half times the mean.

Table 3 Decile poverty rates as a proportion of the mean poverty rate across all SLAs modelled, 2006

Decile of poverty	Number of SLAs	Number of persons	Decile poverty rate as proportion of mean poverty rate	Range of proportions of mean poverty rate within decile
1 - Least poor	105	1425991	0.52	0.14-0.61
2	82	1423352	0.68	0.61-0.73
3	77	1432888	0.78	0.73-0.83
4	80	1408532	0.87	0.83-0.92
5	56	1271331	0.96	0.92-0.98
6	80	1605060	1.03	1.00-1.06
7	70	1422310	1.10	1.06-1.15
8	79	1426587	1.20	1.15-1.24
9	91	1434324	1.31	1.24-1.36
10 - Most poor	198	1430940	1.53	1.36-2.73
Total	918	14281315	na	na

Data source: Authors' calculations

4 Conclusion and next steps

These initial results from regional modelling suggest that, at least in relation to income poverty, rural areas in Australia continue to experience greater concentrations of hardship than capital cities – and, in particular, that areas of very low poverty are much more likely to be urban than rural. This tendency accords with earlier estimates of the regional distribution of income poverty, including studies that have looked at the differences between capital cities and balance of state at a broad level (Chin et al 2006; Ciurej, Tanton, and Sutcliffe 2006; Harding and Szukalska 2000; Lloyd et al 2001;), which generally show higher levels of poverty in rural than capital city locations. Other research using wider measures of disadvantage, for example Vinson's work on small area disadvantage (2001; 2004; 2007) has also tended to find greater rural than urban disadvantage.

There are also substantial overlaps between the areas our spatial microsimulation techniques indicate have high concentrations of income poverty, and areas which other research using alternative disadvantage indicators and non-simulated data find to be highly advantaged or disadvantaged. One example of this relates to the Queensland areas west of Mackay (discussed above), which Vinson (2007) found to be moderately advantaged (Vinson 2007), and which in our study fall into the second quintile of income poverty (that is, having the second lowest proportion of people in poverty).

It is important to note that one of the strengths of small area analysis is its ability to show exceptions to general geographic trends, and, as noted above, there are numerous areas within capital cities which have high or moderately high estimated levels of income poverty. While concentrations of very low levels of income poverty are rare outside the capital cities, there are also nevertheless many rural areas which do not fall into the bottom (poorest) quintile of income poverty. These sort of differentiations within broad regions shown in our results accord well with analyses such as Vinson's work discussed above, and the work on regional disparities published by Baum and colleagues (Baum, O'Connor and Stimson 2005).

It should also be noted that the conclusions about lower poverty rates within the cities might be affected if we took greater account of differentials in the cost of living between the cities and the bush. While it is difficult to fully account for such differentials, one obvious possibility is to subtract housing costs from income and then calculate after-housing poverty rates. There is evidence to suggest that taking housing costs into account in the calculation of regional differences in advantage and disadvantage reduces, but does not eliminate, some of the differences in income poverty between capital city and non-capital city areas (see McNamara et al, forthcoming).

The magnitude of the differences we found in the poverty rates for different spatial areas underlines the importance of estimating and analysing data at a high level of spatial disaggregation. Existing studies of trends in poverty at a national level may in fact disguise differences between areas, and possible above-average increases or decreases in poverty within small areas. Future work may be able to track small area trends in poverty over time, in order to provide further insights into the ways national poverty trends may possibly play out differently within and across small areas.

The spatial microsimulation work undertaken for this study demonstrates the ability of this sort of estimation to produce data about disadvantage useful for policy makers and service providers. However, considerable further work is continuing to add value to the results presented here.

While these results have been validated against earlier estimates produced by NATSEM (Chin et al 2006), and found to match well with those figures, further validation against more recent data is still being undertaken. In addition, as noted earlier, estimates for Australia's remaining states and territories are still being calculated. In the near future, detailed data from Australia's 2006 census will be released (only basic data have so far been released), and this will also be incorporated into our modelling. Although we have addressed the issue of differing population sizes between SLAs to some extent by presenting our results in population-weighted quantiles, we will in the future be aggregating results for some areas with very small SLAs to bring them into closer alignment with average SLA population sizes.

Perhaps the most important developments in this work relate to the ability of spatial microsimulation to be used for evidence-based policy making. Additional regional work at NATSEM is using projection methodologies to produce estimates of population characteristics into the future, so that policy makers can use these estimates as needs-based planning indicators. Also, because our regional weights are applied to the output file from STINMOD, our regional models have the capability not just to estimate the regional distribution of poverty, as demonstrated in this paper, but, more importantly, to model possible policy responses to the alleviation of disadvantage.

References

- Australian Bureau of Statistics (ABS) (2001), *Statistical Geography Volume 1 Australian Standard Geographical Classification (ASGC) 2001*. Australian Bureau of Statistics, Canberra, Cat. No. 1216.0.
- (2004), *Household and Family Projections 2001-2026, Australia*, Cat. No.3236.0, ABS, Canberra.
- 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.
- Chin, S.F and Harding, A. (2007), 'spatialMSM – NATSEM's Small Area Household Model for Australia', in Gupta, A and Harding, A (eds), *Modelling Our Future: Population Ageing, Health and Aged Care*, International Symposia in Economic Theory and Econometrics, Volume 16, Elsevier B. V., Amsterdam, pp. 563-566.
- Chin, S.F., Harding, A. and Tanton, R. (2006), 'A spatial portrait of disadvantage: income poverty by Statistical Local Area in 2001'. Paper presented at the ANZRSAI Conference, Beechworth Victoria, 26-29 September 2006.
- Chin, S.F, Harding,A, Lloyd, R., McNamara, J., Phillips, B. and Vu, Q.N. (2005), 'Spatial Microsimulation Using Synthetic Small-area estimates of Income, Tax and Social Security Benefits', *Australasian Journal of Regional Studies*, Vol. 11, No. 3, pp. 303 - 335
- Ciurej, M, Tanton, R and Sutcliffe, A (2006), Analysis of the regional distribution of relatively disadvantaged areas using 2001 SEIFA, Canberra: ABS, Pub. # 1351.0.55.013
- Greenwell, H., Lloyd, R. and Harding, A. (2001), 'An introduction to poverty measurement issues'. NATSEM Discussion Paper No. 55. National Centre for Social and Economic Modelling, University of Canberra.
- Gregory, R.G. and Hunter, B. H. (2001), 'The Growth of Income and employment Inequality in Australian Cities', in G. Wong and G. Picot (Eds) *Working Time in Comparative Perspective, Volume 1: Patterns, Trends and the Policy Implications of Earnings Inequality and Unemployment*, W.E. Upjohn Institute for Employment Research, Kalamazoo.
- Harding A, Lloyd R, Bill A, King A. (2006), 'Assessing Poverty and Inequality at a Detailed Regional Level: New Advances in Spatial Microsimulation' in M McGillivray and M Clarke (eds), *Understanding Human Well-being*, United Nations University Press, Helsinki, pp 239-261.
- Harding, A, Yap, M and Lloyd, R, (2004), 'Trends in Spatial Income Inequality, 1996 to 2001', AMP. NATSEM *Income and Wealth Report*, Issue No 8, September 2004 (available from www.amp.com.au/ampnatsemreports)

- Harding, A, Lloyd, R, Greenwell, H, (2001), *Financial Disadvantage in Australia 1900 to 2000: The persistence of poverty in a decade of growth*. The Smith Family, Camperdown, NSW, November 2001 (available from www.natsem.canberra.edu.au).
- Harding, A. & Szukalska, A. (2000a), 'Financial disadvantage in Australia – 1999'. The Smith Family, Sydney NSW.
- Headey, B. (2005), 'A framework for assessing poverty, disadvantage and low capabilities in Australia'. Paper presented at the HILDA Survey Research Conference, Melbourne, September 29-30 2005.
- Hunter, B.H. (1995), 'The Social Structure of the Australian Urban Labour Market: 1976-1991', *Australian Economic Review*, 2'95, 65-79.
- (2003), 'Trends in Neighbourhood Inequality of Australian, Canadian and US Cities since the 1970s', *The Australian Economic History Review*, 43(1), 22-44.
- Lloyd, R. (2007), 'STINMOD: use of a static microsimulation model in the policy process in Australia', in Harding, A, and Gupta, A. (eds), *Modelling our Future: Population Ageing, Social Security and Taxation*, International Symposia in Economic Theory and Econometrics, Volume 15, Elsevier B. V., Amsterdam.
- Lloyd, R., Harding, A. and Greenwell, H. (2001), 'Worlds apart: postcodes with the highest and lowest poverty rates in today's Australia'. Paper presented to the National Social Policy Conference, Sydney 2001.
- McNamara, J., Tanton, R. and Phillips, B. (2006), 'The regional impact of housing costs and assistance on financial disadvantage: positioning paper'. Australian Housing and Urban Research Institute, Melbourne.
- McNamara, J., Tanton, R. and Phillips, B. (forthcoming), 'The regional impact of housing costs and assistance on financial disadvantage: final report'. Australian Housing and Urban Research Institute, Melbourne.
- Marks, G.N. (2007), Income poverty, subjective poverty and financial stress. Social Policy Research Paper No 29, FaCSIA, Canberra.
- Melhuish, T., King, A. and Taylor, E. (2004), 'The regional impact of Commonwealth Rent Assistance'. Australian Housing and Urban Research Institute, RMIT-NATSEM Research Centre.
- Melhuish, T, Blake, M. and Day, S. (2002), 'An Evaluation of Synthetic Household Populations for Census Collection Districts Created Using Optimisation Techniques', *Australasian Journal of Regional Studies*, Volume 8, No. 3, pp. 269-387
- Saunders, P. (2005), *The Poverty Wars: Reconnecting Research with Reality*. UNSW Press: Sydney, NSW.
- Saunders, P. and Bradbury, B. (2006), 'Monitoring trends in poverty and income distribution: data, methodology and measurement'. *The Economic Record*, Vol 82 (258), 341-364.

- Taylor, E., Harding, A., Lloyd, R. & Blake, M. (2004), 'Housing unaffordability at the Statistical Local Area level: new estimates using spatial microsimulation'. Paper presented at the 2004 ANZRSI Conference, Wollongong, NSW, September 2004.
- Vinson, T. (2007), *Dropping off the edge: the distribution of disadvantage in Australia*. A report of Jesuit Social Services and Catholic Social Services Australia.
- Vinson, T. (2004), *Community adversity and resilience: the distribution of social disadvantage in Victoria and New South Wales and the mediating role of social cohesion*. Jesuit Social Services, Richmond, Victoria.
- 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.