Developing a Typology of Socio-spatial Disadvantage in Australia

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Abstract: Slums and ghettos may be absent from Australia's cities but distinct concentrations of poverty and disadvantage can be found in almost every major conurbation and larger regional centre. For residents, this often means contending with poor housing and inadequate local amenities, as well as insufficient family income. Drawing on an ongoing research project, this paper details the development of an exploratory methodology to identify, classify and map 'disadvantaged places' in Sydney, Melbourne and Brisbane. Four distinct disadvantaged area types are identified across the three cities, although the pattern appears significantly more complex and multi-faceted in Sydney than in the other two metro areas.

1. Introduction

Even the most economically prosperous cities contain disadvantaged areas. This aspect of socio-spatial differentiation has been widely observed in the urban literature with reference to many developed countries including the US (Lichter et al., 2012; Jargowsky, 1997, 1994; Abramson & Tobin, 1995; Galster & Mikelsons, 1995), the UK (Power, 2012; Rae, 2012) and Australia (Pinnegar et al., 2011; Randolph & Holloway, 2005a). As emphasized in the US literature, such patterns can reflect the locally specific negative impacts of post-industrial economic restructuring as well as the historically determined location of housing tracts affordable to low income groups – e.g. public housing estates. Whilst the association between public housing and disadvantaged neighbourhoods is familiar in Australian cities (see Arthurson, 1998) Australia's experience contrasts with cities in the US and other developed countries in its limited heritage of deindustrialisation.

Within the literature, the term 'disadvantaged area' has been conceptualised in several distinct albeit inter-related ways. Firstly, there is the conception that refers to the spatial concentration of disadvantaged people – i.e. those experiencing poverty, deprivation or exclusion. As a shorthand, this can be referred to as a 'people-based' approach. A number of Australian scholarly articles have used typology analysis in operationalising this conception (see Baum, 2006; Baum et al., 2006; and Reynolds & Wulff, 2005).

A second conception of 'disadvantaged area' is a place which (inherently) disadvantages its residents. Such place-based disadvantage may result from poor access to employment opportunities, public services and other amenities, or may reflect negative features of the local environment such as pollution. Though the issue of measurement of place disadvantage in terms of 'remoteness from services' is rarely addressed in Australia, some recent indices calculated by Dodson & Sipe (2007, 2008) incorporate the concept of transport disadvantage. Thirdly, localities associated with a high incidence of social problems such as domestic violence, other crime or substance abuse may be interpreted as a 'disadvantaged area'. Conceptualised as such (e.g. Vinson, 2007), the spatial distribution of disadvantage is measured via indicators of 'social pathology'.

Partly for simplicity, and to take advantage of existing and respected metrics available at an appropriate spatial scale, our study opted to conceptualise 'disadvantaged areas' in terms of spatial concentrations of disadvantaged people – loosely put, a geography of poverty. Given our main focus on the identification, classification and mapping of such disadvantaged places, policy implications flowing from the analysis are not covered within the scope of the paper.

Historically, the geography of urban poverty in Australia resembled that of many US and European cities, with disadvantaged populations substantially concentrated in inner areas of cities such as Sydney and Melbourne (Kendig, 1979). Subsequently, however, Australia's major capital cities have seen a consistent dynamic of suburbanising disadvantage partly associated with gentrification of inner urban areas (Maher, 1992; Badcock, 1994; Yates & Vipond, 1990; Randolph & Holloway, 2005b, 2007; Baum & Gleeson, 2010). While such urban processes have been widely observed across the developed world (Lees, 2008; Davidson, 2008; and Atkinson, 2004) their operation in Australia has been particularly vigorous. Especially in Sydney, the 'push factor' of inner city gentrification has been compounded by the outer metropolitan focus of public housing development (Badcock, 1984), and by the new migrant magnet effect of low cost private housing in some peripheral suburbs (Birrell, 1993).

In Australian as well as international literature, the term 'social disadvantage' is closely associated with concepts such as poverty, social deprivation and social exclusion. While these notions overlap, it is important to understand their distinct meanings in order to fully comprehend their precise significance. Poverty is most simply defined as a situation where a person lacks the means of adequate income providing acceptable levels of material resources or standard of living (Government of Ireland, 2007). Saunders (2011) (as cited in Jones et al., 2013) has shown that the concept of deprivation has been used to operationalize poverty by indicating what constitutes a minimum acceptable standard of living. The concept of social exclusion is broader in the sense that it is the end result of a set of processes denying people rights, opportunities and resources (Levitas et al., 2007). Social exclusion thus restricts the ability to participate in the relationships and activities, deemed 'socially normal'. The broader concept 'social disadvantage' is an umbrella term that refers to the circumstances of people in possession of relatively low levels of material prosperity in society – in terms of material resources or opportunities for social participation and life outcomes (Jones et al., 2013). Bringing these concepts together, 'socio-spatial disadvantage' refers to the "geographic concentration of households whose relatively low income (poverty) and resources deprive them of an acceptable standard of living (deprivation) and of opportunities for social and economic participation (social exclusion)" (Jones, 2012).

This spatial concentration of social disadvantage is seen to be problematic partly due to the hypothesized existence of 'neighbourhood' or 'area' effects (Galster et al., 2007). That is, the idea that, 'deprived people who live in deprived areas may have their life chances reduced compared to their counterparts in more socially mixed neighbourhoods ... living in a neighbourhood which is predominantly poor is itself a source of disadvantage' (Atkinson & Kintrea, 2001, pp. 3–4). While it remains contested in the academic realm (e.g. Cheshire, 2007), this thesis has achieved growing recognition and acceptance among urban policymakers both internationally and in Australia. Thus, a recent officially sponsored Australian report commented: 'It has been found that when social disadvantage becomes entrenched within a limited number of localities a disabling social climate can develop that is more than the sum of individual and household disadvantages and the prospect is of increased disadvantage being passed from one generation to the next' (Vinson 2009, pp. 5). This kind of thinking has been cited by many governments in support of measures to 'de-concentrate' large public housing estates.

In order to address the problems of disadvantaged areas, urban policymakers need to recognise and understand both the spatial distribution of such areas across cities, and the nature and diversity of such localities (Pinnegar et al., 2011). Measuring, mapping and classifying disadvantaged areas thus becomes of paramount importance. To contribute to methodological development in this area, we report here on an approach to identifying and classifying disadvantaged areas which has generated an overview of the geography of poverty in Australia's three largest cities Sydney, Melbourne and Brisbane. This was conducted as part of a larger study funded by the Australian Housing and Urban Research Institute (AHURI), the main purpose of the exercise was to establish a platform and analytical framework for subsequent housing market analysis, social survey fieldwork and locally focused qualitative investigation in the three cities. Here, however, we aim to address two key research questions:

- What is the geography of poverty across the three cities?
- How can we understand and capture heterogeneity of disadvantaged areas?

A more specific motivation for investigating the extent of social and housing system diversity within the cohort of 'disadvantaged places' in Australia is the understanding that associations between public housing and disadvantage have historically provided the main focus for policy interest in this subject. Hence, despite the known fact that a large proportion of Australia's low income population lives in privately owned dwellings, 'housing and urban policy frameworks in Australia have remained essentially silent in places where those concentrations are cross-tenure or predominantly housed within the private sector' (Pinnegar et al., 2011, pp. 3).

A critical precursor to investigating the geography of poverty is the determination of an appropriate spatial scale of analysis. Inevitably, such decisions are heavily influenced by data availability considerations. This partly accounts for the popularity of census tract-level analysis in the US context. Likewise in Australia, the crucial role of census data in any poverty-mapping exercise means that the researcher's choice is limited to ABS-recognised geographies. Our thinking here was influenced by the perceived need for spatial units with some inherent meaning to local residents and policy makers. It was also recognised that the typical population size of the chosen unit of analysis needed to be

large enough for sound quantitative analysis but not so large that extensive internal diversity could 'dilute' (and thereby render statistically invisible) any significant spatial concentration of disadvantage. On these grounds, therefore, with Collector Districts (CDs) being judged too small and Local Government Areas too large, we chose the ABS-defined suburb as our unit of analysis. For context, across the three cities there were 1,725 suburbs in 2006, with an average population of 5,360.

To address the first of the above research questions we developed a methodology to facilitate a suburb level analysis of the Australian Bureau of Statistics (ABS) Socio-Economic Index for Areas – SEIFA – index. In tackling the second research question we undertook a cluster analysis (CA) utilising relevant census derived socio-economic indicators. An account of the precise methods developed here forms the main body of this paper – see Sections 2 and 3. In conclusion, Section 4 then revisits and reflects on our key findings.

2. Identifying disadvantaged places

The SEIFA index and its utility in this research

In developing our geography of poverty in Sydney, Melbourne and Brisbane the first task was to identify cohorts of disadvantaged suburbs in the three cities. Here, as noted above, we opted to make use of the well-known ABS deprivation index commonly known as SEIFA. Before outlining our approach, and to set this in a wider context, we first discuss briefly the nature of such indices and the implications of their use.

Deprivation indices are formulae which draw on a range of individual indicators for a geographical unit to derive a single composite score for that spatial entity. Conventionally, that score can then be used to place the unit in a wider (e.g. national) area ranking, especially with the aim of identifying the cohort of localities below a certain quantile threshold – e.g. in the lowest 10% of the distribution. The development of such indices stems, in part, from the recognition that government has an interest in measuring the spatial distribution of social disadvantage and also from an acknowledgement that – as noted above – this concept is complex and multi-faceted. Hence, the need for sophisticated metrics which go well beyond the simple measurement of income poverty. Indices of this type are widely used in social research and, as seen in the UK, can be of practical importance in targeting government anti-poverty programs (see Blackman, 2006; Chatterton & Bradley, 2000; Brennan et al., 1999; Simpson, 1996).

The use of indices to quantify and rank socio-spatial disadvantage has a long history (Mitchell & Norman, 2012). In the UK context, well-known instances include the Townsend index (1987), Breadline Britain (Gordon, 1995; Dorling et al., 2007), the Index of Local Conditions (DoE, 1983, 1994) and the Index of Multiple Deprivation (IMD) (Noble et al., 2000; Noble et al., 2004; Noble et al., 2008; McLennan et al., 2011; Noble et al., 2006). Disadvantage indices have been developed in a number of other countries including the US, New Zealand and Canada (Bell et al., 2007).

In Australia, the ABS Socio-Economic Indices for Areas (SEIFA) have been widely used since 1990 (ABS, 2006). Like the IMD and similar UK metrics as developed in Scotland and Wales, SEIFA indices designate 'disadvantage' values at the most local level of census geography (see below). Distinct from IMD, however, SEIFA metrics are entirely derived from census variables and make no use of administrative data.

While there are three other separate SEIFA indices, the SEIFA variant used in our study was the Index of Relative Socio-Economic Disadvantage (IRSD). This is based on 16 variables including incomes, unemployment, disability and language skills. Our choice of IRSD (hereafter simply termed 'SEIFA') reflected an understanding that this is the most all-encompassing and relatively temporally comparable SEIFA metric.

In employing SEIFA values in this study it is also acknowledged that the index may not be ideal for this purpose. Firstly, there was a recognised risk that the inclusion of public housing as a specific component of the 2006 SEIFA index could make a SEIFA-based geography of disadvantage inherently biased towards state housing areas. In practice, however, exploratory work focused on Sydney established that this was not a major concern since a quasi-SEIFA measure excluding public housing produced a spatial pattern little different to the SEIFA-generated geography. Secondly, the index has some shortcomings in that certain relevant factors are not well-represented. In particular, while they incorporate income, SEIFA indices contain little information on wealth (ABS, 2006). Neither

do they reflect living costs – e.g. as in the calibration of poverty 'after housing costs'. Notwithstanding these limitations, it was decided to proceed with a SEIFA-based approach mainly because of the framework's widely accepted utility as a simple and comprehensive measure.

Applying SEIFA metrics at suburb level

As noted above, SEIFA values apply to the smallest census areal units – CDs in the 2006 census – rather than to suburbs or larger units. Therefore, in assigning SEIFA-derived values at the suburb level, it was decided that 'disadvantaged suburbs' would be defined as those containing at least 50% 'disadvantaged' CDs. Reliance on SEIFA also necessitated the adoption of 2006 census geography because the 2011 census-based SEIFA rankings were not available at the time of the analysis (2012). This had crucial practical implications in that use of 2011 and 2001 census data required the customised configuration of the relevant datasets according to 2006 census suburb boundaries.

Therefore, the initial step was to identify 2006 'disadvantaged' CDs in each metropolitan area, and to classify these according to whether situated in suburbs with 50% or more such CDs. The starting point for this exercise was to rank the 2006 SEIFA scores for CDs, nationally across Australia. Focusing on the three cities, this enabled us to identify those Sydney, Melbourne and Brisbane CDs in the most disadvantaged echelon of the nation-wide ranking. While a lower quartile threshold was initially envisaged as the point in the national CD SEIFA standings below which CDs would be classed as 'disadvantaged', we eventually opted for a lower quintile threshold, partly to focus the study on the 'most disadvantaged' places and partly for convenience since SEIFA rankings are typically in deciles.

Having identified 'disadvantaged CDs' as described above, the next step was to assign each 'disadvantaged CD' to its respective suburb. This involved matching CDs and suburbs for 2006. This matching was undertaken via a GIS analysis. Because some officially recognised 'suburbs' are largely non-residential areas whose inclusion could distort the analysis, we applied a 'disadvantaged population' threshold to exclude from consideration any suburb where disadvantaged CD population was less than 2,000.

Summary outputs of the analysis

Summary outputs of the analysis are set out in Table 1. Overall, across the three cities, 15% of all CDs lay within the lowest quintile of the national SEIFA CD ranking. Notably, the city-specific figures all fell below 20%, implying that the propensity for a CD to be 'disadvantaged' was somewhat lower here than the national propensity. Applying the methodology for identifying 'disadvantaged suburbs' as described above, the analysis enumerated 146 such suburbs in 2006 – 77 in Sydney, 45 in Melbourne and 24 in Brisbane – see Table 1.

Importantly, the identified suburbs encompassed the majority of disadvantaged CDs in all three cities – 69% in Sydney, 75% in Melbourne and 54% in Brisbane in 2006. This suggests substantial spatial clustering. That is, most 'disadvantaged CDs' are set within suburbs where they form a majority (or otherwise encompass a large population). Especially in Sydney and Melbourne, few such CDs were situated in areas isolated from other such localities.

Table 1 – Identifying Disadvantaged Suburbs: Summary Outputs

	Sydney	Melbourne	Brisbane	All
Total number of CDs[1]	6,697	6,176	2,992	15,865
Number of disadvantaged CDs	1,123	892	422	2,437
% of disadvantaged CDs	17	14	14	15
Number of suburbs[2]	815	492	418	1,725
Number of disadvantaged suburbs	77	45	24	146
% of disadvantaged suburbs	9	9	6	8
Number of disadvantaged CDs in disadvantaged suburbs	777	672	226	1,675
% of disadvantaged CDs in disadvantaged suburbs	69	75	54	69
Population in disadvantaged suburbs	708,383	586,576	184,639	1,479,598
Population in disadvantaged suburbs as % of total city population	17	16	11	16

Source: Based on 2006 Census analysis

Notes to table: 1. CDs without a SEIFA score, i.e. industrial areas and areas with too few residents etc., were excluded from the analysis (53 CDs in Sydney, 149 CDs in Melbourne and 55 CDs in Brisbane were discarded for this reason). 2. As suburbs are not an ASGC standard geography, CDs were mapped to suburbs through correspondences (concordances) – see ABS statistical geography webpages at: www.abs.gov.au

Results of our initial analysis as outlined above were mapped and 'groundtruthed' – i.e. considered within the context of local knowledge. This gave rise to a slight refinement of our suburb population threshold methodology to allow for the physical contiguity of 'separate suburbs' and to avoid excluding suburbs which, although falling short of the '50% disadvantaged CDs' threshold, still contained substantial 'disadvantaged' populations (i.e. people living in disadvantaged CDs). The resulting application of revised threshold rules[i] designated 177 disadvantaged suburbs across the three cities.

In all three cities, the 2006 disadvantaged suburbs were located primarily in the middle and outer suburban areas (see Annex 1), reflecting significant pre-2006 gentrification of inner cities. Most (86%) of the 2006 disadvantaged suburbs were also spatially contiguous with others similarly classified. In the Sydney and Melbourne metropolitan areas there were three clear agglomerations: in the outer west, northwest and southwest of Sydney and in the west, north and south east of Melbourne. In Brisbane two main groupings were apparent: in a ribbon stretching inland along the Brisbane River, and in the south of the metropolitan area around Logan.

3. Classifying disadvantaged places

Contextualising our approach

Having identified a cohort of disadvantaged suburbs in each city – 177 in all – the next step was to differentiate these through development of a typology. Here a choice was faced. One option would have been to impose a deductive framework – employing prior knowledge to define a set of hypothesized 'ideal type' functional area categories (e.g. drawing classifications developed in previous studies). These area type categories would have been operationalized through the identification and use of relevant socio-economic/housing market indicators available at a suitable spatial scale. Instead, however, we opted for an inductive model – assembling relevant socio-economic data at the suburb level and subjecting this to statistical analysis in the expectation that this would reveal distinct 'clusters' or areas with common combinations of values on specific variables. Approaching the taxonomising task in this way could be termed 'letting the data speak'.

In developing a classification of spatial units based on a multi-variate statistical analysis we were following a well-established tradition in urban geography research. In the Australian context, examples include the use of cluster analysis in studies of regional settlements by Beer and Maude (1995), Baum et al (2006) and Baum (2006). In Baum et al (2006), for instance, metropolitan centres were grouped in terms of shared socio-economic and demographic outcomes into a seven-fold classification. In the US context, cluster analysis has been applied to the large-scale classification of central cities (e.g. Hill et al., 1998) and metropolitan suburbs (Mikelbank, 2004). Somewhat more targeted studies have also been undertaken – e.g. focused on 'inner ring suburbs' Hanlon (2009). Of more specific relevance to our research, this latter study 'serve[d] to further erode outdated perceptions of not only uniform suburbs, but uniform inner ring suburbs' (Mikelbank, 2011, pp. 319). Rather than seeking to group areas with common socio-economic characteristics, Vicino (2008) used cluster analysis to classify US suburbs not in terms of their current composition or characteristics, but in relation to their 'change over time' trajectories as regards race, class and age.

Studies more directly pertinent to our research include the work of Beatty et al (2008) who sought to classify the 39 disadvantaged areas in England included in the 1998-2008 New Deal for Communities (NDC) regeneration program. Similarities with our research include both the remit of the exercise – places defined as socio-economically disadvantaged – and the scale of the analysis – with an average population of 4,000, NDC spatial units were similar in size to ABS suburbs. In the Beatty et al study, 36 indicators drawn from household survey data and administrative record systems were subjected to

[i] Revised 'threshold' rules adopted were: (a) Only suburbs containing at least 2,000 people in disadvantaged CDs were included except in relation to suburbs with at least 1,000 people if physically contiguous with other 'disadvantaged suburbs'; (b) Suburbs containing at least 5,000 people in 'disadvantaged CDs' were included even where the percentage of 'disadvantaged CDs' in the suburb fell short of 50%; (c) Suburbs were included as 'disadvantaged' where at least 40% of the population lived in disadvantaged CDs and there was a population count of over 2,000.

a principal components analysis (PCA). Indicators included variables on education, employment, health, crime, housing and community. The stated purpose of the classification exercise was to help address questions such as: ''is it easier for some types of NDCs to make progress rather than others' and 'is there any evidence that some types of NDCs find it easier to make progress in some types of outcomes?'' (Beatty et al., 2008, pp. 63). The five clusters emerging from this analysis were: (1) Low on human capital, high on fear of crime and relatively unstable; (2) Relatively stable, 'working class' with fewer entrenched problem; (3) London neighbourhoods; unstable population, least deprived; (4) Relatively thriving areas with higher BME (black and minority ethnic) populations outside London; (5) Low on human capital but relatively stable with low fear of crime.

Potentially of even greater relevance to the current research have been the UK studies which, in seeking to classify disadvantaged areas, have focused on the functional roles of neighbourhoods as revealed by residential mobility patterns. These include the work of Bailey & Livingstone (2007) which produced mobility-based typology categories – stability, connection, area change. Similarly, in the Robson et al (2008) study, rather than being based on socio-economic characteristics, area classification was informed by census-derived residential mobility data, available in the UK at small spatial scales. Central here was an analysis of localities in terms of in-mover and out-mover flows, as regards the relative social status of the neighbourhoods from which and to which moves had occurred. The four distinct deprived neighbourhood types identified by Robson et al – transit, escalator, improver and isolate – were of interest not simply in social research terms, but with respect to the informed targeting of potential policy responses.

Having contextualised our research in relation to existing studies, we now move to an account of how our study was undertaken. Next, we briefly introduce the cluster analysis methodology. We then explain the prior steps needed in preparation for this analysis. Summary tables of the final cluster analysis results are then presented and discussed.

Cluster analysis methodology

Cluster analysis (CA) is an exploratory data reduction technique that organises data into more meaningful and manageable groups within a large sample. Clusters (in this case localities) are defined in terms of inter-relationship between variables. Hence, CA indicates that the members within an emerging cluster are similar to each other in certain respects. Since it cannot be known at the outset the number of clusters/types that will emerge, a two-stage sequence of analysis is undertaken:

a) Hierarchical cluster analysis (HCA) to identify inherent clusters within the sample[ii].

b) K-means cluster analysis[iii] with the selected optimal number of clusters with the greatest possible distinction.

Selection of cluster analysis variables and assembly of data

In applying the cluster analysis approach summarised above, we used 14 census-based indicators of disadvantaged suburbs' socio-economic status, under three headings:

- social/residential mobility (Dimension A),
- lifecycle stage/family type (Dimension B), and
- change over time in socio-economic status (Dimension C).

The 14 variables themselves are shown in Table 3.

While seeking to build on existing studies (see above) our approach was unfortunately constrained by data availability considerations on local level residential mobility. While ABS census forms record actual 'former addresses' for respondents who have recently moved to their current residence, such data is coded (and therefore available for analysis) only at Statistical Local Area (SLA) scale. Hence,

[ii] Hierarchical cluster analysis was completed using the Ward's method applying squared Euclidean distance as the distance measure.

[iii] Once the possible number of types is known, the CA was re-run using the computationally efficient k-means method. See Lai (2004) and Gilman et al. (2005) for use of this strategy in various contexts.

in analysing 'former address' data for recent in-movers to a particular suburb, previous residential locations cannot be classified at the required (small area) geographic level. Given the typically large size of SLAs (e.g. averaging 64,000 population in Sydney, 2006) and the resulting scope for internal socio-economic diversity such areas cannot be meaningfully used to inform an analysis similar to the Robson et al study. Unfortunately, therefore, rather than differentiating suburbs in terms of Robson-type socio-spatial mobility patterns, Dimension A indicators were necessarily limited to simpler and more familiar metrics – gross mobility rates and incidence of recent overseas migrant arrivals.

In the main, it was possible to generate suburb-level values for our chosen 14 indicators via ABS Tablebuilder. In relation to Dimension C (change over time) variables, however, 2001 data needed to be obtained via customised purchase from ABS to supplement material sourced from ABS Basic Community Profile (BCP) databases.

While our identification of disadvantaged areas necessarily utilised 2006 ABS suburb geography (see above) our typology was informed by the latest – 2011 – census data, as well 2001 census data for the Dimension C variables. This required the configuration of 2011 (and 2001) census data according to 2006 census boundaries through GIS.

Cluster analysis results – overview

Through initial HCA application we were able to identify and eliminate from the analysis two 'outlier' Sydney suburbs revealed through the analysis as unique (in 'overseas migration churn' and socio-economic change over time, respectively). Having removed the associated distortion a k-means cluster analysis was performed for the remaining 175 disadvantaged suburbs based on the four area types which emerged from the initial HCA results. This produced a more balanced grouping of members within each category – see Table 2 (suburb membership of each typology category is mapped in Annex 2).

Table 2 – Summary of Typology Distribution

Suburb typology category	Sydney		Melbourne		Brisbane		All	
	No of suburbs	*Pop (000s)*	No of suburbs	*Pop (000s)*	No of suburbs	*Pop (000s)*	No of suburbs	*Pop (000s)*
Type 1	13	*49*	-	-	1	*2*	14	*51*
Type 2	48	*534*	25	*388*	-	-	73	*923*
Type 3	13	*68*	2	*17*	11	*43*	26	*128*
Type 4	15	*106*	23	*261*	24	*184*	62	*550*
Total	89	*757*	50	*666*	36	*229*	175	*1,652*

Source: Authors' calculations

Table 3 illustrates the extent to which each typology category is distinguished by relatively high or low values on specific indicators – a matter which we revisit below.

Table 3 – Summary of Variables by Typology Category

Dimension	Variable		Disadvantaged suburbs					Rest of city**	City total
	Type	Summary definition	Type 1	Type 2	Type 3	Type 4	All		
A – social/residential mobility	Household	% of households moved in previous 5 years	24.1	25.6	39.0	33.5	29.7	34.0	33.3
	Household	% of households moved in previous 5 years from an overseas address	1.6	7.1	2.2	5.8	6.2	6.5	6.5
B - lifecycle stage/family type	People	% of population >65 and not in labour force	8.0	10.4	21.5	10.9	11.3	10.0	10.2
	People	% of population aged 0-12	24.8	18.1	13.4	17.5	17.6	16.4	16.6
	People	% of population aged 13-18	11.6	8.1	6.3	7.4	7.8	7.5	7.5
	People	% of population aged 19-24	8.6	9.0	6.0	8.9	8.8	8.6	8.7
	Household	Couples with dependent children %*	19.3	27.9	13.1	20.6	23.5	27.7	27.7
	Household	Single parents with dependent children %*	23.5	10.0	9.0	10.6	10.4	6.2	6.2
	Household	Lone person %*	17.8	18.1	35.2	24.7	22.2	20.9	20.9
C – Change over time in socio-economic status	People	% change in unemployment 2001-2011	-2.5	-2.3	-3.0	-3.3	-2.8	-0.6	-0.9
	People	% change in 25-44s left school at Yr 10	-12.1	-11.9	-14.2	-13.8	-12.9	-7.9	-8.7
	People	% change in 15-24s not in education, employment or training	-2.3	-1.6	-2.7	-2.7	-2.1	-1.2	-1.5
	Household	% change in low income households***	8.2	8.2	3.4	2.8	5.7	3.1	3.4
	People	% change in persons with low status jobs****	-2.8	-7.2	-6.2	-8.1	-7.6	-7.4	-7.5

*As a proportion of all households
**Cumulative figures for Sydney/Melbourne/Brisbane combined
***Proportion in approximately the bottom 40% of the Australia-wide household income distribution
****Scores of 35 or below in the occupational status scale – the Australian Socioeconomic Index 2006 (for 2011) and 'ANU4' (for 2001)
Source: Authors' calculations

As shown in Table 2, Types 2 and 4 not only included the highest number of disadvantaged suburbs (77%), but also contained a considerable proportion of population within them (89%). Table 2 also suggests substantial contrasts in the incidence of disadvantaged suburbs of different kinds in the three cities, raising issues which we discuss in the next section.

A separate component of our secondary data analysis (reported elsewhere) involves a detailed analysis of housing markets in the identified disadvantaged suburbs. In the current context, however, partly to assist in provisional 'labelling' of the typology categories, a simple overview of housing market structures specific to each suburb cohort is shown in Table 4. Notable here is that rental housing is somewhat more common in disadvantaged suburbs than elsewhere, especially as regards social rental. As might be expected, the incidence of 'buying with a mortgage' is somewhat lower in all typology categories than in non-disadvantaged suburbs. Outright ownership, however, typically runs at a fairly similar rate and is above citywide norms in Type 3 areas.

Table 4 – Summary of Housing Tenure Breakdown

Suburb typology category	% social rent	% private rental	% owned with mortgage	% owned outright
All Type 1 suburbs	43.5	14.7	22.2	17.3
All Type 2 suburbs	8.1	26.4	31.1	31.4
All Type 3 suburbs	6.8	30.7	23.4	35.5
All Type 4 suburbs	11.1	29.6	30.1	26.4
All disadvantaged suburbs	10.0	27.6	29.8	29.7
Rest of Sydney/Melbourne/Brisbane	3.2	25.2	37.9	31.7
All of Sydney/Melbourne/Brisbane	4.3	25.6	36.6	31.4

Source: Authors' calculations

On the basis of Tables 3 and 4 it can be seen that distinguishing socio-economic and housing characteristics of each typology category include:

Type 1 High on young people and single parent households; high on social renting

Type 2 High on overseas movers, high on two parent families

Type 3 High on residential mobility but low on overseas movers, high on older people; high on private rental, high on outright home ownership

Type 4 High on overseas movers, somewhat low on change in unemployment and change in incidence of low status jobs

Cluster analysis results – spatial patterns in geographies of poverty

As already noted, the overall geography of disadvantage across the three cities features substantial clustering of affected suburbs. Moreover, as apparent from Annex 2, specific types of disadvantaged area are also either:

- spatially grouped – especially true of Types 2 and 4, or
- spatially distinctive – the almost entirely peripheral location of Type 3 areas.

In both their incidence and their geography, Type 1 areas are strongly associated with the scale and location of public housing (see Table 4). A scale issue also arises here as one possible explanation for the absence of Type 1 areas in Melbourne. Relevant here is the observation that while, as noted above, the average 2006 suburb accounted for 5,360 people, public housing estates are generally much smaller. Also, because the average suburb size in Melbourne was substantially larger than in the other two cities the chance of 'public housing domination' at suburb level is inherently lower.

Type 2 suburbs – the most numerous of the four area types (see Table 2) – are well represented in both Sydney and Melbourne, but absent in Brisbane. The possible reasons for this are more difficult to postulate. Type 3 suburbs are present – albeit in limited numbers – in all three cities. This category possesses perhaps the most striking spatial pattern, with a marked tendency to appear in peripheral

locations, possibly suggesting an association with low priced housing. Type 4 suburbs are also present in all three cities, but distributed somewhat differently; a substantially agglomerated pattern in Brisbane contrasting in particular with a scattered distribution in Sydney.

4. Conclusions

This paper has reported on an exploratory data analysis to probe the nature and distribution of spatially concentrated disadvantage in Australia's largest cities. Results confirm a number of common patterns across the three cities. Disadvantaged suburbs are geographically concentrated in the middle and outer suburban regions of Sydney, Melbourne and Brisbane. With many of these being places far from central cities and other metropolitan centres, residents are also likely to experience place-based disadvantage on account of their remoteness from employment and services. In this respect, the typical experience of poverty in contemporary Australia may be more problematic than historically when such populations tended to be more centrally located.

The analysis has confirmed the inaccuracy of the widely-held assumption that urban poverty in Australia is exclusively associated with the location of public housing. At the suburb-scale, public housing is only a major presence in one of the four distinct 'disadvantaged area' typology categories emerging from the analysis. It also suggests that socio-spatial disadvantage is a somewhat more complex and multi-faceted phenomenon in Sydney than in the other two cities.

From a methodological perspective, the paper has pointed up the critical importance of decisions on the appropriate spatial scale of analysis and the limitations imposed by census geographies. Without question, Australia's census is immensely valuable to social research - e.g. in its incorporation of income data and its five-yearly periodicity. However, as this study has revealed ABS census administrative conventions on residential mobility variables impose important limitations on the utility of such data in the analysis of local housing markets.

Whilst the main aim of this paper has been to identify, classify and map disadvantaged places in Australia's major cities, the policy implications flowing from this analysis remain to be addressed in future papers which will be informed by the primary fieldwork undertaken as part of the same project.

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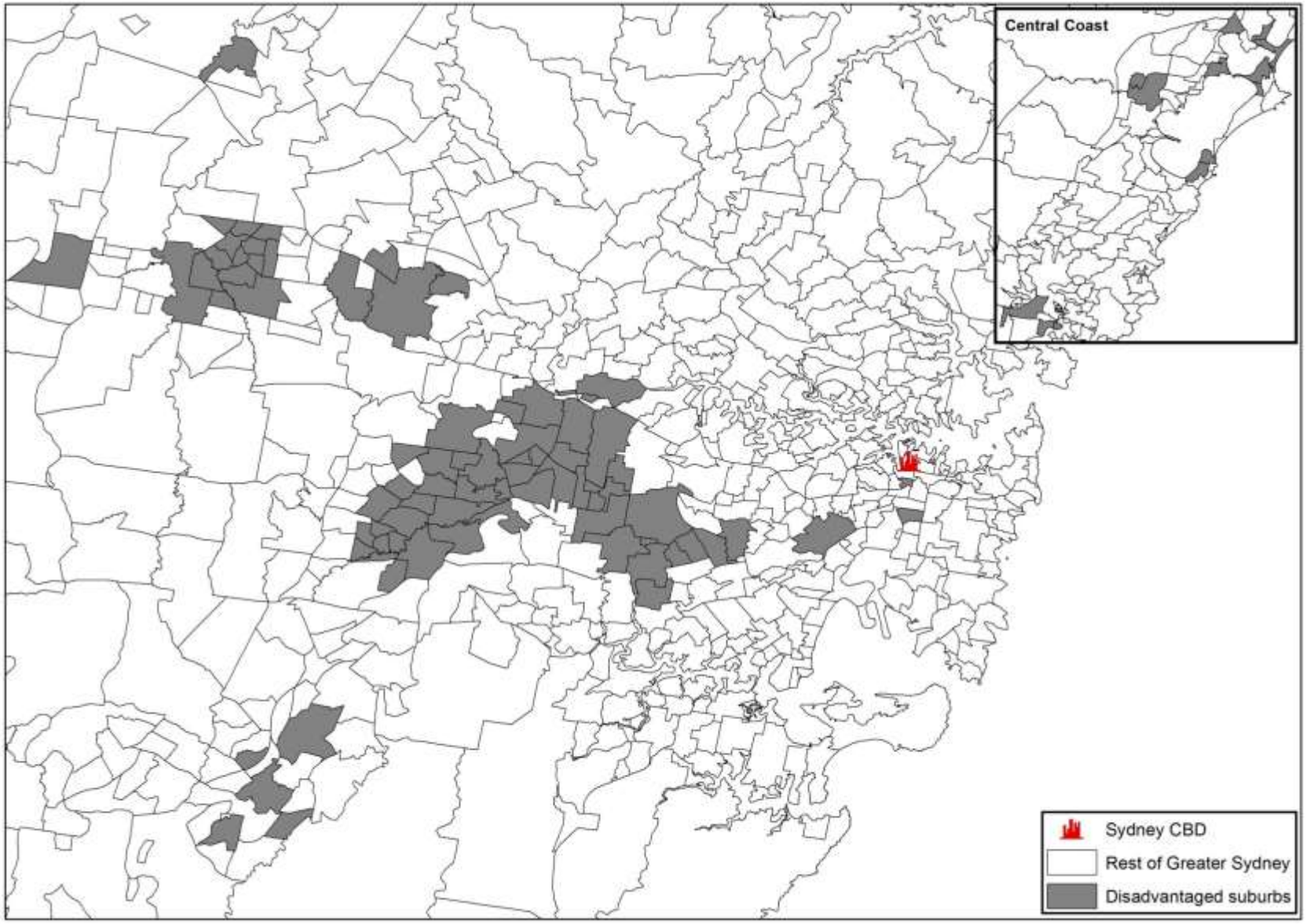
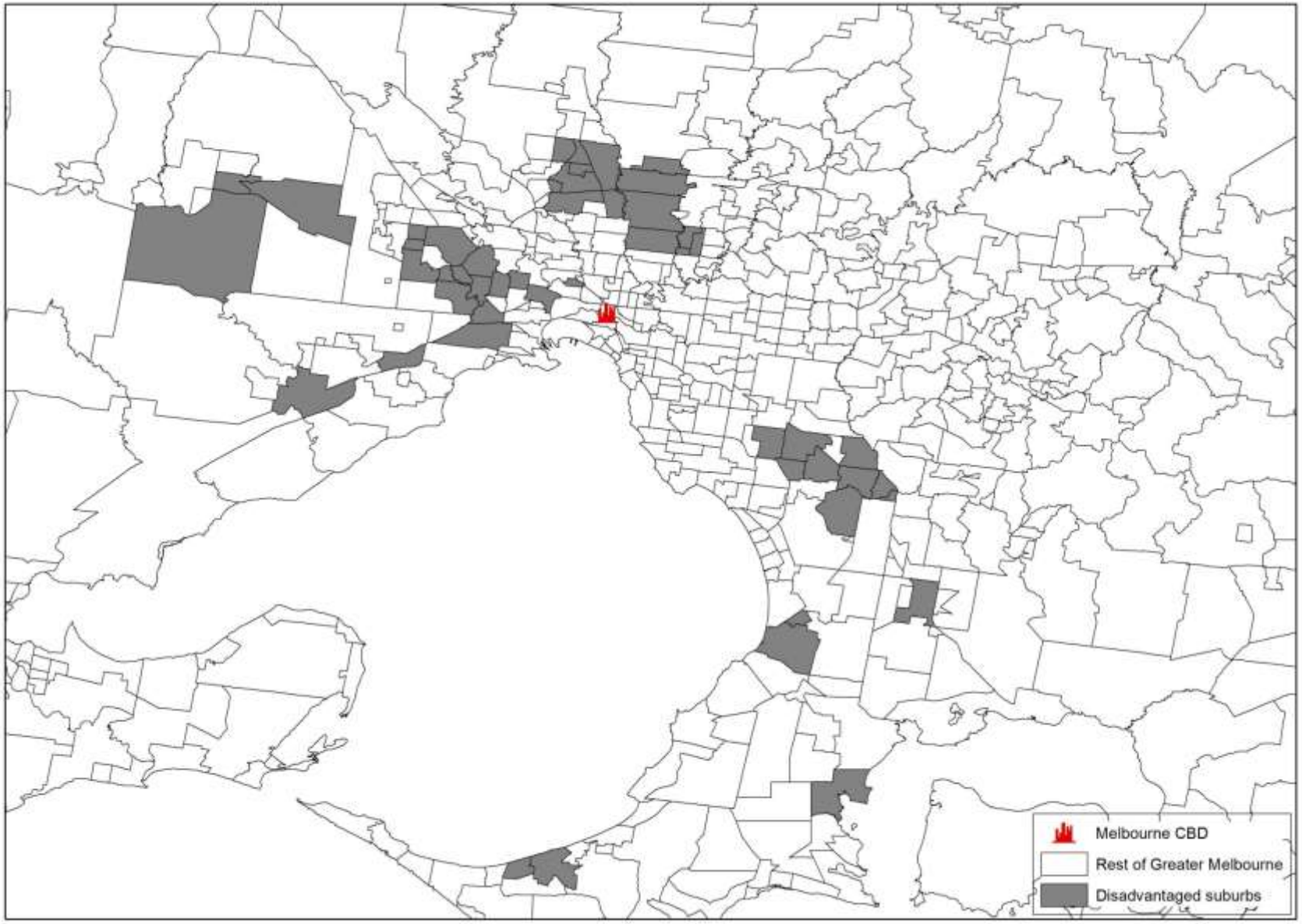
Annex 1 – Mapping the Geography of Disadvantage at Suburb Level: Sydney, Melbourne and Brisbane 2006

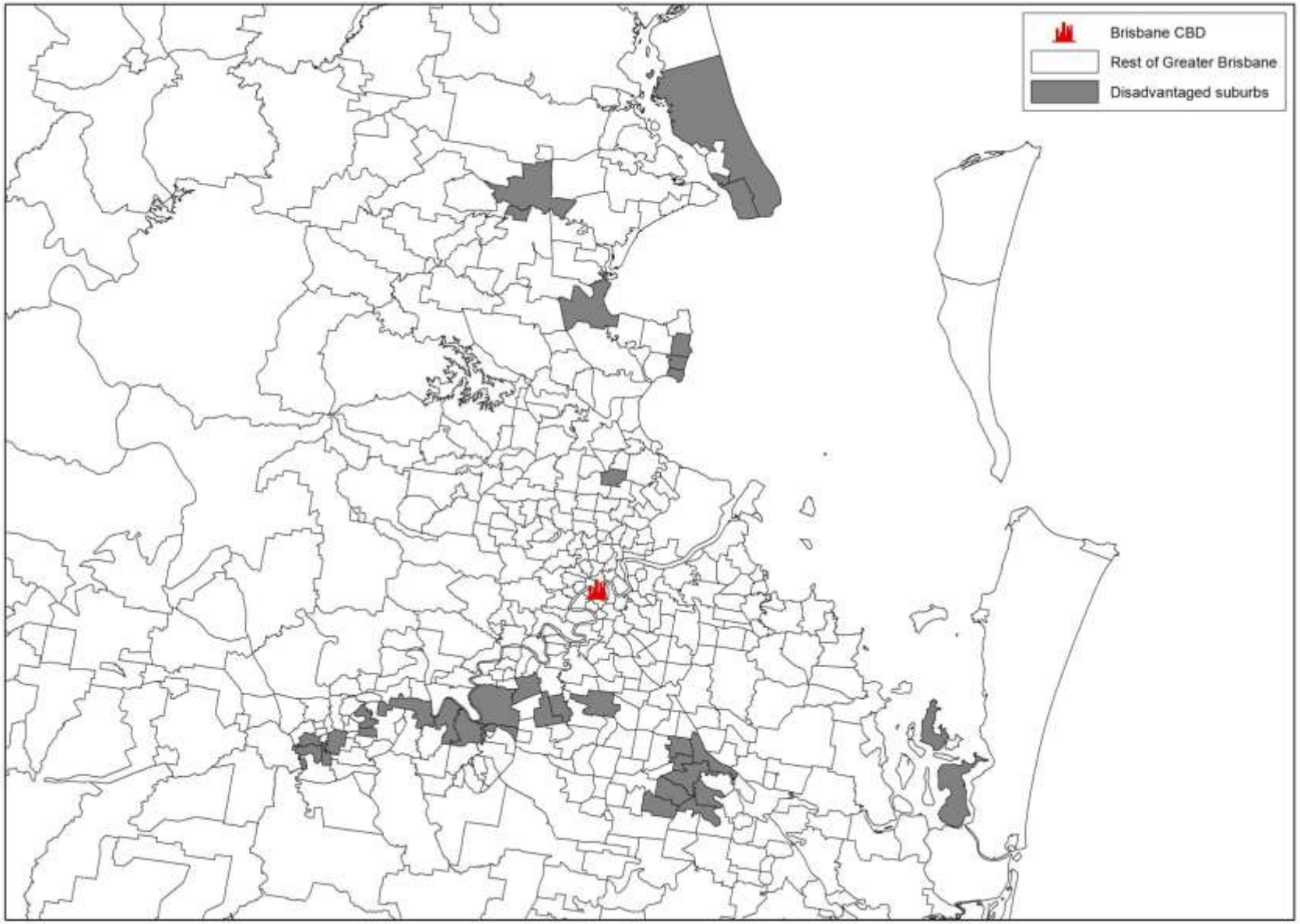
Map A1.1 – 2006 Disadvantaged suburbs in Sydney



Map A1.2 – 2006 Disadvantaged suburbs in Melbourne

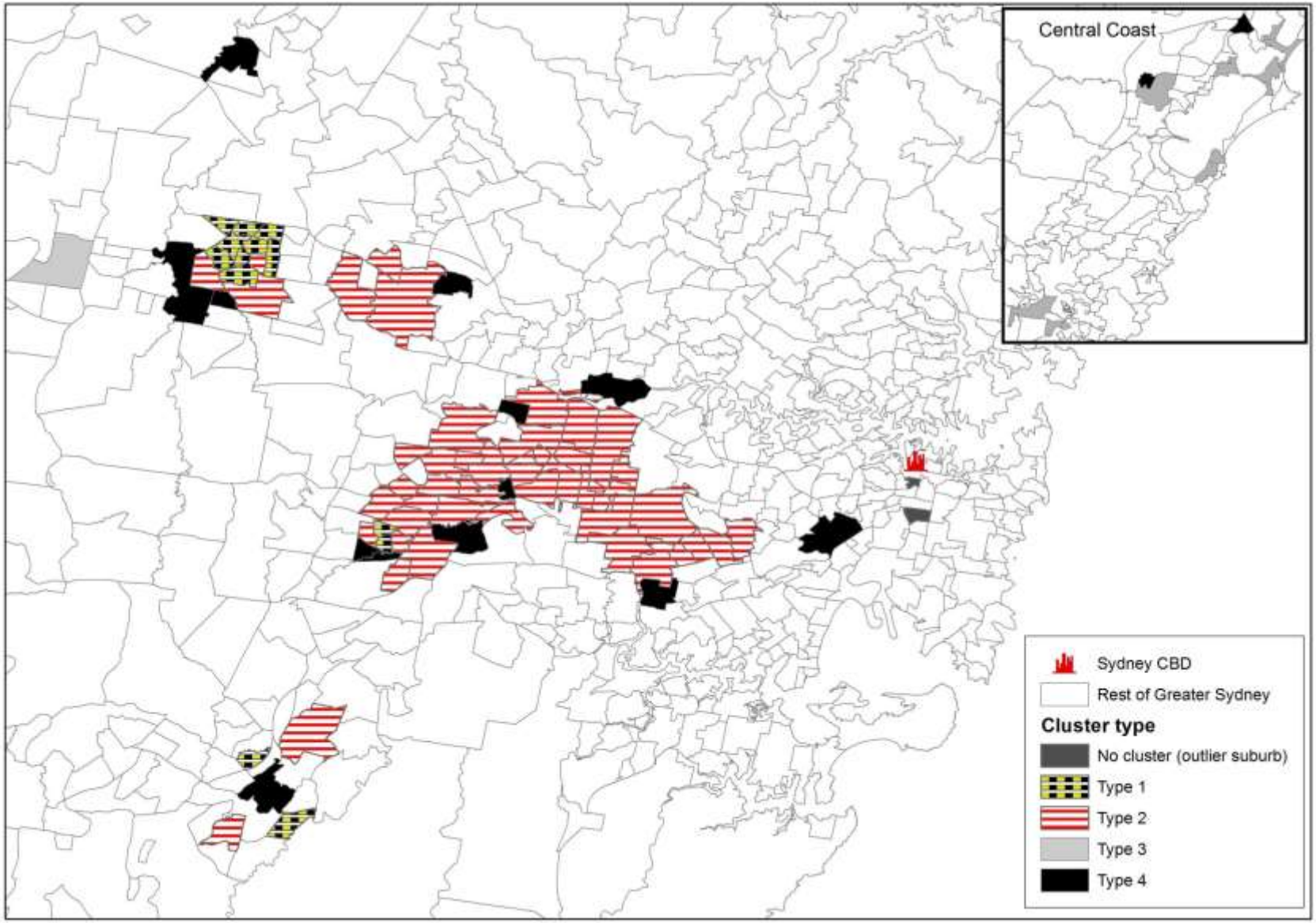


Map A1.3 – 2006 Disadvantaged suburbs in Brisbane

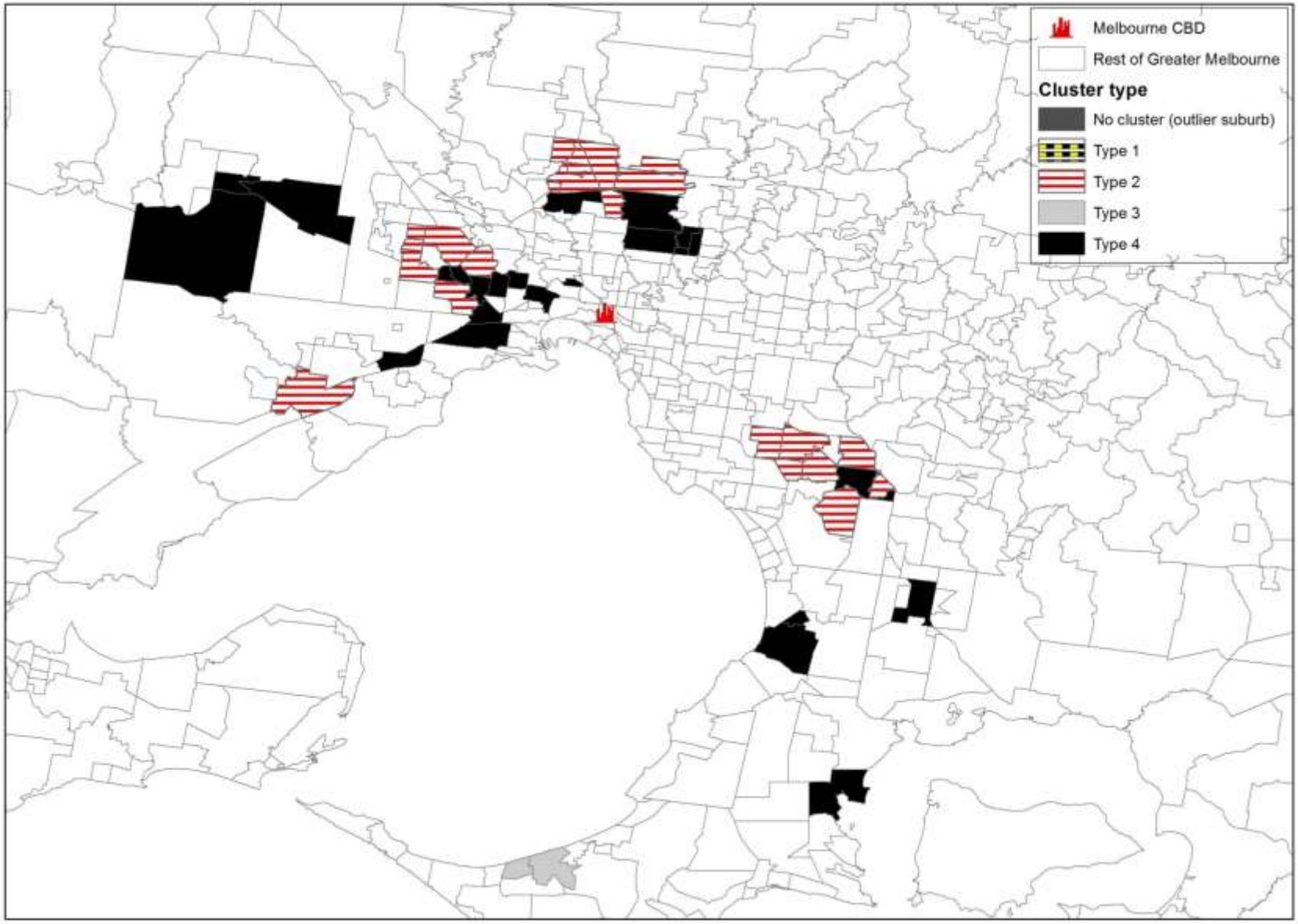


Annex 2 – Spatial Distribution of Distinct ‘Disadvantaged Suburb’ Types in Sydney, Melbourne and Brisbane

Map A2.1 – 2006 Disadvantaged suburbs in Sydney differentiated according to socio-economic variables (2011 data)



Map A2.2 – 2006 Disadvantaged suburbs in Melbourne differentiated according to socio-economic variables (2011 data)



Map A2.3 – 2006 Disadvantaged suburbs in Brisbane differentiated according to socio-economic variables (2011 data)