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Socio-Economic Indexes for Areas (SEIFA) - Technical Paper

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SOCIO-ECONOMIC INDEXES FOR AREAS (SEIFA) – TECHNICAL PAPER

1. INTRODUCTION

1.1 Purpose of technical paper

This paper provides information on the method, concepts and data used to create Socio-economic Indexes for Areas (SEIFA) 2006. The purpose of this paper is to give users a good understanding of how the indexes were created, and how they can be used in socio-economic analysis. Regarding the use of SEIFA, we especially encourage users to read Section 1.3 (Interpreting SEIFA) and Section 6 (Using SEIFA). The accompanying *Information Paper: An Introduction to Socio-economic Indexes for Areas (SEIFA)* (ABS cat. no. 2039.0) is also a useful resource, which provides a non-technical introduction to the concepts involved in SEIFA and its use.

1.2 The 2006 SEIFA

1.2.1 The 2006 indexes

The ABS first produced a measure of relative socio-economic disadvantage following the 1971 Census. SEIFA in its present form began as five indexes produced from the 1986 Census. The number of indexes was reduced to four in SEIFA 2001, when the Urban Index of Relative Socio-economic Advantage and the Rural Index of Relative Socio-economic Advantage and Disadvantage were replaced with a single index.

SEIFA 2006 is a set of four indexes:

- The Index of Relative Socio-economic Disadvantage; [1]

- The Index of Relative Socio-economic Advantage and Disadvantage; [2]

- The Index of Education and Occupation; and

- The Index of Economic Resources.

The Index of Relative Disadvantage, using indicators of low socio-economic wellbeing, provides a general measure of disadvantage. The Index of Relative Advantage and Disadvantage extends this measure to encompass the entire socio-economic spectrum. The Index of Education and Occupation focuses specifically on the educational and occupational aspects of socio-economic status. The Index of

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[1] For convenience, in this paper we generally use the shortened form 'The Index of Relative Disadvantage' to refer to this index.

[2] For convenience, in this paper we generally use the shortened form 'The Index of Relative Advantage and Disadvantage' to refer to this index .

Economic Resources focuses specifically on financial aspects of relative advantage and disadvantage.

We have generally attempted to maintain consistency between SEIFA 2006 and the previous release. However, a number of methodological improvements have been made to the 2006 indexes:

- the Index of Economic Resources has been revised to better capture dimensions of income and wealth (for more information, see Appendix A);

- an explicit concept of relative advantage and disadvantage was used as the framework for selecting variables (see Section 2);

- all SEIFA variables were calculated using the respondent's place of usual residence rather than their location on Census Night (see Section 3.1.1);

- income variables were calculated using equivalised household income (see Section 3.1.2);

- a new classification standard has been used to define the occupation variables (see Section 3.1.5); and

- new SEIFA variables have been introduced, and a number of variables have been improved (see Section 3).

1.2.2 Geographic areas available

SEIFA 2006 is released for the following geographic levels:

- Census Collection District (CD);
- Postal Area (POA);
- Statistical Local Area (SLA); and
- Local Government Area (LGA).

The basic geographic level used to create SEIFA is the CD. The CD is the smallest spatial unit in the *Australian Standard Geographic Classification* (ASGC) (ABS cat. no. 1216.0). SLAs and LGAs are larger units in the ASGC. POAs are a CD-based approximation of Australia Post postcodes, and are part of the *Census Geographic Areas* classification (ABS cat. no. 2905.0).

Indexes are no longer produced for geographic levels higher than those listed above. The reason is that as the size of an area increases, it becomes correspondingly more heterogeneous and the socio-economic index becomes less and less meaningful. To analyse the socio-economic differences between large areas, we recommend observing the distribution of CD scores within each area (see Section 6.2).

1.3 Interpreting SEIFA

Before using SEIFA, it is important to be aware of some key issues relating to the indexes. Further information and examples demonstrating the use of SEIFA are given in Section 6.

1.3.1 Area level indexes

SEIFA indexes are assigned to areas, not to individuals. They indicate the collective socio-economic status of the people living in an area. A relatively disadvantaged area is likely to have a high proportion of relatively disadvantaged people. However, such an area is also likely to contain people who are not disadvantaged, as well as people who are relatively advantaged. When area level indexes are used as proxy measures of individual level socio-economic status, many people are likely to be misclassified. This is known as the ecological fallacy.

Baker and Adhikari (2007) investigated the potential for misuse of SEIFA to lead to an ecological fallacy. They created experimental socio-economic indexes for individuals and families, using variables from the 2001 Index of Relative Disadvantage. When individuals' indexes were compared to the index for the area in which they lived, there were significant discrepancies. They concluded that using SEIFA as an individual or family level measure led to a high risk of ecological fallacy.

1.3.2 Ordinal indexes

As measures of socio-economic level, the indexes are ordinal. They can be used to rank areas, but cannot be used to measure the size of the difference in socio-economic level between areas. For example:

- we cannot infer that an area with an Index of Relative Disadvantage value of 500 is twice as disadvantaged as an area with an index value of 1,000; and

- the difference in relative socio-economic disadvantage between two areas with values of 900 and 1,000 is not necessarily the same as the difference between two areas with values of 1,000 and 1,100.

We recommend using the indexes to group areas into quantiles (e.g. deciles), then using these quantiles as the basis for analysis, rather than using the index scores. Examples are provided in Section 6.4.

1.3.3 Importance of the underlying variables

Each index is constructed based on a weighted average of selected variables. The indexes are dependent on the set of variables chosen for the analysis. A different set of underlying variables would result in a different index. At the same time, because of the large number of variables in each index, removing or altering one variable will not

usually have a large effect. Each variable set was selected based on our notion of relative socio-economic advantage/disadvantage or the particular aspect of socio-economic status for that index (e.g. economic resources). The list of potential variables was constrained by what was available from Census.

Users should consider the aspect of socio-economic status, in which they are interested, and examine the underlying set variables in each index (see Section 3). This will allow them to make an informed decision on whether a SEIFA index is appropriate for their particular purpose.

1.3.4 Problems with longitudinal analysis

SEIFA is designed to compare the relative socio-economic status of areas at a given point in time, not to compare individual areas across time. We do not recommend performing analysis which aims to compare change in socio-economic conditions using SEIFA indexes from different Census years. The reasons why we do not advocate this type of longitudinal analysis include:

- the constituent variables and variable weights for the index are likely to have changed;

- the boundaries of the relevant small area(s) may have changed;

- the distribution of the standardised index values will have changed (e.g. a score of 800 does not represent the same level of disadvantage in different years); and

- the 2006 indexes are calculated using the characteristics of an area's usual residents, rather than those of the people in the area on Census Night (as was done in previous editions of SEIFA).

2. CONCEPTUAL FRAMEWORK

2.1 The notion of relative socio-economic advantage and disadvantage

The Index of Relative Disadvantage and the Index of Relative Advantage and Disadvantage identify and rank areas in terms of relative socio-economic advantage and disadvantage.[3] It is important to clarify what we mean by these terms.

Adopting a notion of relative (rather than 'absolute') disadvantage, we can only say that an area is disadvantaged with reference to the situation and standards applying in the wider community at a given point in time. The use of relative concepts to measure socio-economic disadvantage has been generally accepted in the literature since the poverty studies of Henderson (1975) and Townsend (1979).

Another aspect of disadvantage as measured in SEIFA is that it is multidimensional. For example, consider a community with a relatively high level of financial wellbeing. On this basis we may conclude that this area is relatively advantaged. However, if this community also has very high crime rates, or poor levels of general health, these factors may cause us to view the area as relatively disadvantaged.

A measure of relative socio-economic advantage and disadvantage could include any number of social and economic dimensions. The dimensions that are included in SEIFA are guided by international research, given the constraints of Census data. Census does collect information on the key dimensions of income, education, employment, occupation and housing. It is generally agreed in international literature (e.g. Krieger et al., 2003; Bailey et al., 2003; Walker & Hiller, 2005) that these are important indicators of socio-economic disadvantage. They are also core dimensions incorporated in other national area level indexes of socio-economic disadvantage or deprivation (Noble et al., 2002; Salmond & Crampton, 2004).

SEIFA measures relative advantage and disadvantage at an area level, not at an individual level. Area level and individual level disadvantage are separate, though interrelated, concepts. Area level disadvantage depends on the socio-economic conditions of a community or neighbourhood as a whole. These are primarily characteristics of the area's residents, such as indicators of income, education or employment. They may also be characteristics of the area itself, such as a lack of public resources, transport infrastructure or high levels of pollution.

Based on international research and also the information collected in Census, we broadly define relative socio-economic advantage and disadvantage in terms of people's access to material and social resources, and their ability to participate in society.

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3   The Index of Education and Occupation and Index of Economic Resources measure particular aspects of socio-economic advantage and disadvantage. These are further discussed in Section 2.2.

2.2 Which index to use

Below is an overview of the scope of the four SEIFA 2006 indexes. For a complete list of the variables included in each index, see Section 3.2.

2.2.1 The Index of Relative Socio-economic Disadvantage

The Index of Relative Socio-economic Disadvantage summarises variables that indicate relative disadvantage at the small area level, according to the concept described in Section 2.1.

The index is designed to focus on disadvantage only. A low score on this index indicates a high proportion of relatively disadvantaged people in an area. We cannot conclude that an area with a very high score has a large proportion of relatively advantaged ('well off') people, as there are no variables in the index to indicate this. We can only conclude that such an area has a relatively low incidence of disadvantage.

2.2.2 The Index of Relative Socio-economic Advantage and Disadvantage

The Index of Relative Socio-economic Advantage and Disadvantage summarises variables that indicate either relative advantage or disadvantage, according to the concepts described in Section 2.1. This index can be used to measure socio-economic wellbeing in a continuum, from the most disadvantaged areas to the most advantaged areas.

An area with a high score on this index has a relatively high incidence of advantage and a relatively low incidence of disadvantage. Due to the differences in scope between this index and the Index of Relative Disadvantage, the scores of some areas can vary significantly between the two indexes. For example, consider a large area that has parts containing relatively disadvantaged people, and other parts containing relatively advantaged people. This area may have a low Index of Relative Disadvantage, due to its pockets of disadvantage. However, its Index of Relative Advantage and Disadvantage may be moderate, or even above average, because the pockets of advantage may offset the pockets of disadvantage.

2.2.3 The Index of Economic Resources

The Index of Economic Resources summarises variables relating to the financial aspects of relative socio-economic advantage and disadvantage. These include indicators of high and low income, as well as variables that correlate with high or low wealth.

Areas with higher scores have relatively greater access to economic resources than areas with lower scores.

Note that because of the new variables introduced to improve the wealth aspect of the index, as well as the use of equivalised household income, the 2006 Index of Economic Resources is not comparable with its 2001 predecessor. For a discussion on the changes, see Appendix A.

2.2.4 The Index of Education and Occupation

The Index of Education and Occupation summarises variables relating exclusively to education, employment and occupation. This index focuses on the skills of the people in an area, both formal qualifications and the skills required to perform different occupations.

A low score indicates that an area has a high proportion of people without qualifications, without jobs, and/or with low skilled jobs. A high score indicates many people with high qualifications and/or highly skilled jobs.

3. SEIFA VARIABLES

This section looks at the variables included in the four SEIFA indexes. All the SEIFA variables were created from the 2006 Census of Population and Housing.[4]

The SEIFA variables can be categorised into the following broad socio-economic dimensions:

- income variables;

- education variables;

- employment variables;

- occupation variables;

- housing variables; and

- other indicators of relative advantage or disadvantage.

Section 3.1 contains a description of each variable. There is a brief discussion explaining how each variable relates to our notion of relative socio-economic advantage or disadvantage. We also highlight the variables that have been modified since SEIFA 2001, and those that are new in 2006. The tables containing the variable descriptions also state whether the variable is an indicator of relative advantage (adv) or relative disadvantage (dis).

Section 3.2 contains a table showing the variable lists for each index. Appendix C contains detailed descriptions of the numerators and denominators for each variable considered for inclusion in SEIFA 2006.

3.1 Description of SEIFA variables

3.1.1 Place of usual residence

One important improvement to SEIFA 2006 that affects all the variables is the use of people's place of usual residence to create CD level counts. A person's place of usual residence may, or may not be the place where the person was counted on Census Night. Previous editions of SEIFA have used Census Night counts to create area level variables. However, certain areas, for example CDs in popular tourist destinations or containing large hotels, may be populated on Census Night by people whose socio-economic characteristics do not reflect those of the CD's usual residents. Counts compiled on a 'place of usual residence' basis are more appropriate for SEIFA, because they are less likely to be influenced by seasonal factors such as school holidays and snow seasons.

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4   Quality Statements are available for each Census data item on the ABS website. See *Census Dictionary, 2006* (ABS cat. no. 2901.0).

3.1.2 Income variables

3.1 List of income variables

Variable mnemonic	Variable description
INC_LOW	% People with stated annual household equivalised income between $13,000 and $20,799 (approx. 2nd and 3rd deciles) (dis)
INC_HIGH	% People with stated annual household equivalised income greater than $52,000 (approx. 9th and 10th deciles) (adv)

Income is an important economic resource, and is a core component of our notion of relative socio-economic advantage and disadvantage (outlined in Section 2.1). Income variables are used in all the SEIFA indexes except for the Index of Education and Occupation.

The 2001 SEIFA income variables were derived separately for each family or household type. For example, two of the 2001 income variables were:

- % couple families with dependent offspring only with income less than $36,400;

and

- % single person households with income greater than $36,399.

The purpose of using a separate variable for each household type was to account for the fact that the amount of household income depends on the number of people in the household. In 2006 we have used the widely accepted practice of equivalising household income. Equivalisation is where the household income is adjusted by an 'equivalence scale'[5], based on the number of adults and children in the household.

The cut-off of $52,000 for the high income variable was chosen to approximately capture the highest income quintile. The range for the low income variable was chosen to approximately capture the second and third equivalised income deciles. It is ABS standard practice to use the second and third income deciles as a low income group, because of the varying financial circumstances of people in the lowest income decile.[6]

The introduction of equivalised income has some effect on the comparability between the 2001 and 2006 indexes. Our analysis has shown that although income by household type is significantly different to equivalised income in a few areas, on the whole the measures are reasonably consistent. The index most affected by the

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5   The scale adopted by ABS is the modified OECD equivalence scale. For details see Appendix 3 in *Household Income and Income Distribution, Australia, 2005–06* (ABS cat. no. 6523.0).

6   The lowest income decile has been found to have higher average wealth and expenditure than the second and third income deciles. For more information see Appendix 3 in *Household Income and Income Distribution, Australia, 2005–06* (ABS cat. no. 6523.0).

change to equivalised income is the Index of Economic Resources, as 11 out of the 15 variables in the 2001 index were income variables.

One limitation of the SEIFA income variables is that personal income is collected in ranges in the Census. In order to calculate household equivalised income, a dollar value had to be imputed for personal income, based on the range reported. The imputed figure was an estimation of the median income for each income range, based on income data from the ABS *Survey of Income and Housing, 2003–04*.

3.1.3 Education variables

3.2 List of education variables

Variable mnemonic	Variable description
ATUNI	% People aged 15 years and over at university or other tertiary institution (adv)
CERTIFICATE	% People aged 15 years and over with a certificate qualification (dis)
DIPLOMA	% People aged 15 years and over with an advanced diploma or diploma qualification (adv)
NOQUAL	% People aged 15 years and over with no post-school qualifications (dis)
NOSCHOOL	% People aged 15 years and over who did not go to school (dis)
NOYEAR12	% People aged 15 years and over whose highest level of schooling completed is Year 11 or lower (dis)

The skills people obtain through school and post-school education can increase their own standard of living, as well as that of their community. There is also a certain amount of prestige associated with educational attainment.

The SEIFA 2006 education variables were all used in SEIFA 2001. They are based on the broad levels of the *Australian Standard Classification of Education (ASCED), 2001* (ABS cat. no. 1272.0).

The CERTIFICATE variable is an indicator of relative disadvantage in SEIFA. It is true that having a certificate qualification gives a person an advantage over someone with no qualifications. However, at an area level, a high proportion of people with certificate qualifications correlates with other disadvantaging characteristics (e.g. lower skilled occupations), thus it indicates relative disadvantage.

3.1.4 Employment variables

3.3 List of employment variables

Variable mnemonic	Variable description
UNEMPLOYED	% People (in the labour force) who are unemployed (dis)
UNEMP_POP_RATIO	% People aged 15 and over who are unemployed (dis)

For most people, employment is the main source of income. Employment can also contribute to social participation and self-esteem. An unemployment variable is included in all of the SEIFA indexes.

The standard unemployment variable (UNEMPLOYED) is calculated as the number of unemployed people divided by the number of people in the labour force. The variable used in the Index of Economic Resources (UNEMP_POP_RATIO) is the number of unemployed people divided by the entire adult population of the area. This was done to distinguish the unemployed from those employed and those not in the labour force, as the latter two groups were found to have significantly higher average wealth.

3.1.5 Occupation variables

3.4 List of occupation variables

Variable mnemonic	Variable description
OCC_DRIVERS	% Employed people classified as Machinery Operators and Drivers (dis)
OCC_LABOUR	% Employed people classified as Labourers (dis)
OCC_PROF	% Employed people classified as Professionals (adv)
OCC_SERVICE_L	% Employed people classified as Low-Skill Community and Personal Service Workers (dis)
OCC_SKILL1	% Employed people who work in a Skill Level 1 occupation (adv)
OCC_SKILL4	% Employed people who work in a Skill Level 4 occupation (dis)
OCC_SKILL5	% Employed people who work in a Skill Level 5 occupation (dis)

Occupation plays a significant part in determining socio-economic status. The ability to accumulate economic resources varies greatly with occupation type. Elements of job satisfaction and social status are also associated with different occupations.

The 2006 SEIFA occupation variables have been classified using *ANZSCO – Australian and New Zealand Standard Classification of Occupations, First Edition, 2006* (ABS cat. no. 1220.0). The SEIFA 2001 variables used *ASCO – Australian Standard Classification of Occupations, Second Edition, 1997* (ABS cat. no. 1220.0). The updated classification differs somewhat from its predecessor. Although the

classification criteria are similar, the 'skill level' concept and its relationship to the occupation major groups have changed.

Each occupation in ANZSCO 2006 is assigned a skill level ranging from 1 (highest) to 5 (lowest), which is "a function of the range and complexity of the set of tasks performed in a particular occupation" (ABS, 2006a, p. 6). These skill levels were used as the basis of the occupation variables in the Index of Education and Occupation. The aim was to include broad categories of both advantaging and disadvantaging occupations, which complement the education variables by introducing the aspect of vocational skills.

For the Disadvantage and Advantage–Disadvantage indexes, we used the ANZSCO major groups in conjunction with the skill levels to construct the occupation variables. This was done to identify occupations, or groups of occupations, which contribute to our concept of relative advantage or disadvantage at an area level. Using the major groups as well as the skill levels also helped to maintain consistency with SEIFA 2001.

The SEIFA 2006 occupation variables were not separately defined for males and females, as was done in 2001, because our analysis showed that male and female versions of the same occupation variable correlated very similarly with other indicators at an area level.

3.1.6 Housing variables

3.5 List of housing variables (a)

Variable mnemonic	Variable description
HIGHBED	% Occupied private dwellings with four or more bedrooms (adv)
HIGHMORTGAGE	% Households paying mortgage who pay more than $2,120 per month (adv)
HIGHRENT	% Households paying rent who pay more than $290 per week (adv)
LOWRENT	% Households paying rent who pay less than $120 per week (excluding $0 per week) (dis)
MORTGAGE	% Households owning the dwelling they occupy (with a mortgage) (adv)
OVERCROWD	% Occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard) (dis)
OWNING	% Households owning the dwelling they occupy (without a mortgage) (adv)
RENT_SOCIAL	% Households renting dwelling from a government or community organisation (dis)

(a) All dwelling variables excluded dwellings whose inhabitants all usually resided elsewhere, whose inhabitants were all under 15, or which could not be classified due to insufficient information. For numerator and denominator specifications see Appendix C.

Having an adequate and appropriate place to live is fundamental to socio-economic wellbeing. There are many aspects to housing that affect the quality of people's lives. Dwelling size, cost and security of tenure are all important in this regard, and are therefore considered in SEIFA.

Housing size is measured by the variables HIGHBED and OVERCROWD. HIGHBED counts dwellings with four or more bedrooms. The variable OVERCROWD, which is new in SEIFA 2006, counts dwellings that do not have enough bedrooms for their occupants. This variable is calculated using the Canadian National Occupancy Standard. [7]

Housing cost is measured in SEIFA using reported mortgage or rent payments. The cut-offs for the high and low groups were based on the ranges corresponding to the top and bottom quintiles. The high housing cost variables (HIGHMORTGAGE, HIGHRENT) are indicators of relative advantage, because they indicate greater financial capacity, as well as higher quality housing or locational advantage. The low housing cost variable (LOWRENT) is an indicator of relative disadvantage, for similar reasons.

Owning a house, with or without a mortgage, is an indicator of advantage. First, owning a house implies security of tenure. For many Australian households, the family home is also the most valuable asset. Owning with a mortgage indicates the financial capacity to make repayments, as well as the possession of a future asset. In contrast, people renting from a government/community authority are dependent on an external agency for their security of tenure, and have less freedom to choose their location. Public housing is highly associated with low financial wellbeing, as this type of accommodation is usually means tested. The 2006 public housing variable (RENT_SOCIAL) was expanded to include community housing authorities, which were not captured in 2001.

Housing stress and housing affordability are aspects of housing that are not well captured in SEIFA. We considered creating a housing affordability indicator, for example by comparing housing costs to household income. However, it is difficult to create an indicator that is comparable across all tenure and household types. There are also data constraints, such as the fact that the Census does not collect information on Commonwealth Rent Assistance. For these reasons we have not attempted to construct a specific housing affordability indicator in SEIFA. The LOWRENT variable may serve as a proxy for housing stress in some areas.

Another limitation of the data available from the Census is that we could not directly capture the quality or value of the dwelling. Although number of bedrooms and amount of rent/mortgage payments provide some indication, these do not determine housing quality or dwelling value in all areas.

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7   The Canadian National Occupancy Standard determines housing appropriateness, using the number of
     bedrooms and the number, age, sex and relationships of household members. For more information refer to
     Housing Occupancy and Costs, Australia, 2005–06 (ABS cat. no. 4130.0.55.001).

3.1.7 Other indicators of relative advantage or disadvantage

3.6 List of other indicators of relative advantage or disadvantage (a)

Variable mnemonic	Variable description
BROADBAND	% Occupied private dwellings with a broadband Internet connection (adv)
DISABILITYU70	% People aged under 70 who need assistance with core activities due to a long-term health condition, disability or old age (dis)
ENGLISHPOOR	% People who do not speak English well (dis)
INDIGENOUS	% People who identified themselves as being of Aboriginal and/or Torres Strait Islander origin (dis)
LONE	% Households that are lone person households (dis)
NOCAR	% Occupied private dwellings with no cars (dis)
NONET	% Occupied private dwellings with no Internet connection (dis)
ONEPARENT	% Families that are one parent families with dependent offspring only (dis)
DIVORCED	% People aged 15 and over who are separated or divorced (dis)
UNINCORP	% Occupied private dwellings with at least one person who is an owner of an unincorporated enterprise (adv)

(a) All dwelling variables excluded dwellings whose inhabitants all usually resided elsewhere, whose inhabitants were all under 15, or which could not be classified due to insufficient information. For numerator and denominator specifications see Appendix C.

Having an Internet connection allows access to information and services and may demonstrate a certain level of financial capability. In SEIFA 2001, proportion of people with any type of Internet connection was used as an indicator of relative advantage. The use of broadband Internet to indicate relative advantage, and lack of any Internet to indicate relative disadvantage, is new in SEIFA 2006.

The disability variable, which is new to SEIFA in 2006, provides an indication of the physical or health aspects of socio-economic disadvantage. It is based on the new Census questions on need for assistance, which were developed to provide an indication of whether people have a profound or severe disability. People with a profound or severe disability are defined as those people needing help or assistance in one or more of the three core activity areas of self-care, mobility and communication, because of a disability, long term health condition (lasting six months or more) or old age. [8] Disability limits employment opportunities, and consequently access to financial resources. For the purpose of indicating relative socio-economic disadvantage, we have limited the scope of the SEIFA disability variable to people aged under 70 (for more information see Appendix B).

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8 Note that the Census measure was designed to indicate the disability status of people in Australia according to geographic area, or for small groups within the broader population. It is not a comprehensive measure of disability. For more information see *Census Dictionary, 2006* (ABS cat. no. 2901.0).

Lacking fluency in English may limit employment opportunities, and ability to participate in society.

Indigeneity is highly correlated with relative socio-economic disadvantage at an area level. It has been shown that on average, Indigenous Australians have significantly lower levels of income, employment and education than the rest of the population (*Population Characteristics, Aboriginal and Torres Strait Islander Australians, 2001* (ABS cat. no. 4713.0)). The variable may also serve as a proxy for factors that are within our notion of relative disadvantage, but not captured by other variables, such as discrimination and loss of culture.

A car is both a material resource and a means of transport that enables greater freedom. A limitation of the NOCAR variable is that the need for a car varies depending on the remoteness of the area and access to public transport.

One parent households are disadvantaged as compared to other household types, because of the need to simultaneously provide and care for dependents. Apart from having lower equivalised household incomes, one parent families have also been shown to have lower rates of employment and labour force participation, lower rates of home ownership and higher incidence of financial stress, as compared to couple family households (see, for example, *Australian Social Trends, 2007,* ABS cat. no. 4102.0). There are significant correlations at area level between the number of one parent families and many indicators of relative socio-economic disadvantage, such as those mentioned above. The same patterns are evident for areas with high proportions of people who are separated or divorced.

An analysis of wealth data from the ABS *Survey of Income and Housing, 2003–04*, showed that lone person households have lower average wealth (per person) than other household types. The proportion of lone person households in an area is correlated with less ability to access economic resources, beyond what is measured by the equivalised household income variables. A high proportion of unincorporated enterprise owners was found to correlate with high wealth and access to economic resources. These two variables were used only in the Index of Economic Resources. For more information on the choice of new wealth-related variables for the 2006 Index of Economic Resources, see Appendix A.

We considered including new Census data items relating to unpaid child care and voluntary work through an organisation or group. However, both these data items had relatively high levels of non-response, their quality had not been externally validated, and they did not correlate strongly with other socio-economic indicators. Therefore neither of these variables were included in SEIFA.

3.2 Variable list for each index

3.7 List of variables in each index, by socio-economic dimension

Dimension	Index of Relative Disadvantage	Index of Relative Advantage and Disadvantage	Index of Economic Resources	Index of Education and Occupation
Income	INC_LOW	INC_HIGH INC_LOW	INC_HIGH INC_LOW	
Education	NOQUAL NOSCHOOL	ATUNI DIPLOMA NOQUAL		ATUNI CERTIFICATE DIPLOMA NOQUAL NOYEAR12
Employment	UNEMPLOYED	UNEMPLOYED	UNEMP_POP_RATIO	UNEMPLOYED
Occupation	OCC_DRIVERS OCC_LABOUR OCC_SERVICE_L	OCC_DRIVERS OCC_LABOUR OCC_PROF OCC_SERVICE_L		OCC_SKILL1 OCC_SKILL4 OCC_SKILL5
Housing	LOWRENT OVERCROWD RENT_SOCIAL	HIGHBED HIGHMORTGAGE HIGHRENT LOWRENT OVERCROWD RENT_SOCIAL	HIGHBED HIGHMORTGAGE HIGHRENT LOWRENT MORTGAGE OVERCROWD OWNING RENT_SOCIAL	
Other	DISABILITYU70 ENGLISHPOOR INDIGENOUS NOCAR NONET ONEPARENT DIVORCED	BROADBAND DISABILITYU70 NOCAR NONET ONEPARENT	LONE NOCAR ONEPARENT UNINCORP	

4. CONSTRUCTION OF THE INDEXES

This section describes the methodology used to construct SEIFA 2006, outlines the process step-by-step and gives the variable loadings, weights and variance explained for each index.

4.1 Method for constructing the indexes

4.1.1 Principal Components Analysis

The SEIFA indexes were calculated using a data reduction technique called Principal Components Analysis (PCA). The aim of PCA is to summarise a large number of correlated variables into a smaller set of transformed variables, called 'principal components'. Each component is a weighted linear combination of the original variables. It is possible to extract as many components as there are variables. If the original variables are highly correlated, much of the variation can be summarised by a single principal component.

The first principal component is the weighted linear combination designed to capture the maximum amount of variation present in the original dataset. This is achieved by using correlations between the variables. In general, variables that are strongly correlated with many others in the set are given high weights. The first principal component is used for SEIFA, as it is the single transformed variable that best summarises the common trend underlying the original set of variables.[9]

Associated with each component, PCA produces:

- *variable loadings*, which are the Pearson correlation coefficients between each variable and the component;

- *an eigenvalue*, which is the variance of the component. The percentage of the variation in the dataset explained by the component is equal to the eigenvalue divided by the number of variables (because each input variable is standardised to have a variance of one); and

- *variable weights*, which are the coefficients used in the linear transformation that produces the component. Each variable weight is equal to the variable loading divided by the square root of the eigenvalue.

More detailed explanations of PCA can be found in, for example, Joliffe (1986) and O'Rourke (2005).

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9 Component rotation is an optional variant of PCA, which can sometimes make components more meaningful. Rotation was investigated as part of a review of SEIFA in 2001. It was concluded, both by ABS analysts and an external peer review group, that the first unrotated component provided the best summary indicator for each of the SEIFA indexes. For more information refer to *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia – Technical Paper., 2001,* (ABS cat. no. 2039.0.55.001).

4.1.2 Constructing the indexes

Step 1. Creating the initial variable list

We created an initial variable list, with the aim of characterising relative socio-economic advantage/disadvantage, or the relevant aspect of socio-economic status, as well as possible, given the available data.

Step 2. Constructing the variables

We created all variables as proportions at CD level (e.g. '% people aged 15 and over with no post-school qualifications'). We then standardised these proportions to a mean of 0 and a standard deviation of 1. The standardisation was done to prevent variables with larger prevalences, or larger ranges, from exerting a larger influence on the index.

Step 3. Removing very highly correlated variables

We removed highly correlated variables to prevent instability in the variable weights and overrepresentation of any specific socio-economic characteristic. When two variables had a correlation coefficient greater than $|0.8|$, we generally removed one of them. However, we applied some discretion, depending on the particular variables and the size of the correlation. For example, we kept both proportion of professionals and proportion of people without qualifications (correlation = –0.82) in the Index of Relative Advantage and Disadvantage, because they measure different socio-economic characteristics (i.e. occupation and education).

Step 4. Conducting the initial PCA

Using the correlation matrix for the set of variables, we conducted principal components analysis to obtain the loading for each variable on the first principal component.

Step 5. Removing low loading variables

We excluded variables with loadings below $|0.3|$, on the grounds that they were not strong indicators of relative advantage or disadvantage. The limit of $|0.3|$ is an accepted level in the PCA literature (see Joliffe, 1986, pp. 108, 111); this limit was also used in SEIFA 2001. [10] We removed variables one at a time, starting with the lowest loading variable.

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[10] A loading limit of $|0.3|$ was used for three of the four 2001 indexes. A limit of $|0.2|$ was used for the 2001 Index of Relative Disadvantage, in an attempt to maintain consistency with the 1996 index.

Step 6. Conducting PCA on the reduced list of variables

We conducted a PCA on the reduced variable list, and if any other variables loaded below 0.3, we repeated steps 5 and 6.

Step 7. Standardising component/index scores

We derived the first principal component scores for each CD by taking the product of each standardised variable with its respective weight, then taking the sum across all variables. For convenience of presentation, we standardised these raw component scores across all included CDs in Australia, to a mean of 1,000 and a standard deviation of 100, to produce the CD level index.

Step 8. Reversing signs of the loadings and weights

For each of the indexes, we multiplied the weight of each variable by –1. This gives advantage indicators positive weights and loadings, and disadvantage indicators negative weights and loadings. Accordingly, high index scores indicate relative advantage, and low index scores indicate relative disadvantage. We did this for convenience of presentation and consistency with previous editions of SEIFA.

Step 9. Creating higher geographic level indexes

We constructed indexes for geographies higher than CD level using population weighted averages of the constituent CDs. We used the following formula:

$$INDEX_{AREA} = \frac{\sum_{i=1}^{n}(INDEX_{CDi} \times POP_{CDi})}{POP_{AREA}}$$

where

INDEX	=	index score for each CD or higher level area
POP	=	population for each CD or higher level area (population with SEIFA scores only)
n	=	total number of CDs (with SEIFA scores) in the higher level area.

Although the higher level indexes were constructed from standardised CD level indexes, they were not standardised themselves. Therefore the POA, SLA and LGA indexes do not necessarily have a mean of 1000 or standard deviation of 100.

Only CDs with SEIFA scores were used to create the higher level indexes. In a small number of cases, where a POA, SLA or LGA contains a number of CDs that were excluded, its SEIFA index may not be representative of its entire population. For this reason, the SEIFA file provides the proportion of each POA, SLA and LGA population that were in excluded CDs.

For SEIFA 2006 we considered conducting a separate principal components analysis at each level of geography. However, this resulted in indexes that were considerably different at each geographic level. For example, some variables that indicated relative disadvantage at CD level indicated relative advantage at higher levels, and vice versa. For the sake of consistency between levels of geography, we maintained the previous practice of constructing higher level indexes using population-weighted means of the CD indexes. However, we encourage users conducting analysis at POA, SLA or LGA level to keep in mind that the indexes were constructed at CD level, and to consider using the distribution of CDs within the larger areas. Examples are provided in Section 6.2.

4.2 Data issues

4.2.1 Creating the variables

Specifications

All the variables used in SEIFA were created from the 2006 Census of Population and Housing. As each variable was expressed as a proportion, a numerator and denominator was required. In most cases, the numerator and denominator specifications were based on SEIFA 2001 specifications. Where variables were new or modified for 2006, we specified numerators and denominators based on our own analysis and research into the relevant literature, as well as consultation with ABS subject matter experts. Appendix C contains detailed descriptions of the numerators and denominators used for all the SEIFA variables.

Not stated

Generally we excluded the 'Not stated' values from both the numerators and denominators. There were some exceptions, where we had some additional information due to the sequencing of the Census questions. For details, see Appendix C.

Zero denominators

Each variable used in SEIFA was a ratio. The numerator for each variable was a subset of the denominator. Therefore, if the denominator was zero, the numerator was also zero. In these cases, the variable was given a value of zero. This is the same procedure we have used in previous indexes.

4.2.2 Validating the variables

Validating numerators and denominators

Numerators and denominators were validated by summing CD level SEIFA variables to State totals, which were then compared to published or independently created figures.

Summary statistics

Summary statistics for each of the SEIFA variables were analysed in order to observe their distributions. Some of the variables were highly right-skewed (meaning most CDs had low proportions for these variables but a few CDs had very high proportions). The most skewed variables were the proportions of Indigenous people, people who never attended school, dwellings that are overcrowded and dwellings rented from government/community authority.

Principal components analysis relies on Pearson correlations, which are measures of linear relationships. The analysis can be affected somewhat by differences in the underlying variable distributions. However, PCA has been shown to be reliable even where the underlying variables are not normally distributed (Dudzinski, 1975). In order to maintain objectivity and ease of interpretation, we did not transform any variables to adjust for skewness.

Comparing 2006 variable values with 2001 values

We compared the 2006 data with 2001 data, to see whether there were unusual changes in any variable. Only variables included in both Censuses, and CDs with similar boundaries in both Censuses, were used in the comparison. For each variable there were a small number of CDs that had significantly different values in 2001 and 2006. However, the average change across all comparable CDs was constrained within expected limits for every variable.

4.2.3 Exclusion of some areas

The populations of some CDs were too small to derive meaningful area level variables. High non-response in key Census data items also jeopardised the reliability of the data for some CDs. SEIFA scores are not meaningful if the input variables are also not meaningful. Therefore, CDs with very low populations, or high levels of non-response to certain Census questions, were excluded from the analysis. The thresholds used to exclude CDs were largely based on those used in SEIFA 2001. We did make some adjustments, which are noted as footnotes below. CDs with any one of the following characteristics were excluded:

- Offshore or shipping CDs. These CDs contain people who are enumerated on offshore oil rigs, drilling platforms and the like, or aboard ship in Australian waters;

- 'No usual address' CDs. [11] These non-geographic CD codes are assigned to people who respond in Census as having 'no usual address'. There is one of these CD codes in each State and Territory;

- CDs with usual resident population less than or equal to ten;

- CDs with five or fewer people employed;

- CDs with five or fewer classifiable occupied private dwellings; [12]

- CDs where equivalised household income could not be determined for 70% of people or more; [13]

- CDs where 70% of people or more did not respond to the Census questions on:

    - occupation (OCCP);

    - labour force status (LFSP);

    - current educational institution (TYPP); [14] and

    - qualifications (QALLP); and

- CDs where more than 80% of people lived in non-private dwellings. [15]

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11 This criteria was used for the first time in 2006, as 2006 is the first time we have usual residence population counts in SEIFA.

12 This new exclusion rule was introduced in 2006 to increase the reliability of the dwelling variables. Many of the variables used in the Index of Relative Advantage and Disadvantage and the Index of Economic Resources use dwelling counts.

13 We have adopted the same non-response cut-off as was used for the family income variable in SEIFA 2001.

14 We modified this exclusion rule in 2006. Now the denominator includes all people in the CD; in 2001 it included only those people attending an educational institution. The previous denominator was quite small in most CDs, and there was an unreasonably large number of CDs being excluded from SEIFA based on this rule alone.

15 The 2001 rule excluded 'CDs where more than 20% of dwellings are non-private'. Non-private dwellings can vary a great deal in terms of population size, therefore a proportion of persons in non-private dwellings is more appropriate.

Table 4.1 shows how many CDs were excluded from SEIFA 2006, due to each exclusion rule. The first column shows the number of CDs falling under each exclusion category. The total number of CDs excluded (1256) is not equal to the sum of the entries in the first column, because each CD can satisfy multiple criteria. The second column shows the number of CDs excluded by each category, that have not been excluded by one of the above categories. The sum of the second column entries equals the total number of CDs excluded.

4.1 Number of CDs excluded by each category, 2006

Exclusion category	CDs in category	CDs excluded by category (hierarchical)
Population = 0	616	616
Offshore, Shipping, No Usual Address	101	47
Population > 0 and ≤ 10	188	163
Employed persons ≤ 5	894	102
Classifiable occupied private dwellings ≤ 5	1,004	127
Household Equivalised Income not stated ≥ 70%	22	1
Occupation not stated ≥ 70%	3	1
Level of education (Non-school qualification) not stated ≥ 70%	284	182
Labour Force Status not stated ≥ 70%	23	0
Type of educational institution attending not stated ≥ 70%	44	0
People in non-private dwellings ≥ 80%	147	17
Total number of CDs excluded		**1,256**

4.3 Variable loadings and weights

This section gives the results of the principal components analysis carried out for each index, including variable loadings, weights, and percentage of variance explained[16]. We also outline which variables were initially considered for inclusion but removed due to high correlations with other variables or weak loadings.

4.3.1 Index of Relative Socio-economic Disadvantage

The Index of Relative Disadvantage summarises variables that indicate relative disadvantage at CD level, according to the concept described in Section 2.1. The final variable loadings and weights are shown below in table 4.2. They are listed in weight order, starting with the strongest indicators of relative disadvantage.

4.2 Variable loadings and weights

Variable mnemonic	Variable loading	Variable weight	Variable description
NONET	–0.85	–0.33	% Occupied private dwellings with no Internet connection
OCC_LABOUR	–0.76	–0.30	% Employed people classified as Labourers
NOQUAL	–0.76	–0.30	% People aged 15 years and over with no post-school qualifications
INC_LOW	–0.76	–0.30	% People with stated annual household equivalised income between $13,000 and $20,799 (approx. 2nd and 3rd deciles)
RENT_SOCIAL	–0.70	–0.27	% Households renting from a Government or Community organisation
UNEMPLOYED	–0.70	–0.27	% People (in the labour force) unemployed
ONEPARENT	–0.67	–0.26	% Families that are one parent families with dependent offspring only
LOWRENT	–0.67	–0.26	% Households paying rent who pay less than $120 per week (excluding $0 per week)
DISABILITYU70	–0.61	–0.24	% People aged under 70 who have a long-term health condition or disability and need assistance with core activities
NOCAR	–0.57	–0.22	% Occupied private dwellings with no car
INDIGENOUS	–0.52	–0.20	% People who identified themselves as being of Aboriginal and/or Torres Strait Islander origin
OVERCROWD	–0.52	–0.20	% Occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard)
DIVORCED	–0.51	–0.20	% People aged 15 years and over who are separated or divorced
OCC_DRIVERS	–0.51	–0.20	% Employed people classified as Machinery Operators and Drivers
NOSCHOOL	–0.44	–0.17	% People aged 15 years and over who did not go to school
OCC_SERVICE_L	–0.44	–0.17	% Employed people classified as Low Skill Community and Personal Service Workers
ENGLISHPOOR	–0.33	–0.13	% People who do not speak English well

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16 These terms are explained in Section 4.1.

Removal of highly correlated variables

The initial variable list for the Index of Relative Disadvantage also contained the variable NOYEAR12 (% People aged 15 years and over whose highest level of schooling completed is Year 11 or lower). However, this variable had a high correlation (above our prescribed cut-off of |0.8|) with the variable NOQUAL (% People aged 15 years and over with no post-school qualifications). Both variables measure educational disadvantage. As post-school qualifications were considered more relevant to our notion of relative socio-economic disadvantage, the NOYEAR12 variable was dropped.

Removal of low loading variables

Table 4.3 shows the variables that were dropped from the Index of Relative Disadvantage, because their loading was below our prescribed cut-off of |0.3|. These variables made minor contributions to the index; without them the index was more precise and explained a larger percentage of the total variation. The variables are shown in the order they were removed; the loading shown for each variable is from the iteration of PCA after which it was dropped. The variable OCC_ADMIN_L was removed first as it indicated advantage rather than disadvantage.

4.3 Variables removed due to low loadings

Variable mnemonic	Variable loading	Variable description
OCC_ADMIN_L	0.14	% Employed people classified as Low Skill Clerical and Administrative Workers
OCC_SALES_L	−0.12	% Employed people classified as Low Skill Sales Workers
FEWBED	−0.20	% Occupied private dwelling with one or no bedrooms

Variance explained

The eigenvalue for the Index of Relative Disadvantage was 6.62. The index explained 39% of the total variance of its 17 input variables. This was higher than the percentage of variance explained by the 2001 Index of Relative Disadvantage (32.5%).

4.3.2 Index of Relative Socio-economic Advantage and Disadvantage

The Index of Relative Advantage and Disadvantage summarises variables that indicate either relative socio-economic advantage or disadvantage, according to the notions described in Section 2.1. The final variable list is shown below in table 4.4; the variables are listed in weight order from strongest disadvantage to strongest advantage.

4.4 Variable loadings and weights

Variable mnemonic	Variable loading	Variable weight	Variable description
NOQUAL	–0.88	–0.29	% People aged 15 years and over with no post-school qualifications
NONET	–0.87	–0.29	% Occupied private dwellings with no Internet connection
INC_LOW	–0.83	–0.28	% People with stated annual household equivalised income between $13,000 and $20,799 (approx. 2nd and 3rd deciles)
OCC_LABOUR	–0.80	–0.26	% Employed people classified as Labourers
LOWRENT	–0.64	–0.21	% Households paying rent who pay less than $120 per week (excluding $0 per week)
DISABILITYU70	–0.61	–0.20	% People aged under 70 who have a long-term health condition or disability and need assistance with core activities
OCC_DRIVERS	–0.60	–0.20	% Employed people classified as Machinery Operators and Drivers
UNEMPLOYED	–0.60	–0.20	% People (in the labour force) unemployed
ONEPARENT	–0.58	–0.19	% Families that are one parent families with dependent offspring only
RENT_SOCIAL	–0.51	–0.17	% Households renting from a Government or Community organisation
OCC_SERVICE_L	–0.38	–0.13	% Employed people classified as Low Skill Community and Personal Service Workers
OVERCROWD	–0.34	–0.11	% Occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard)
NOCAR	–0.33	–0.11	% Occupied private dwellings with no car
HIGHBED	0.41	0.13	% Occupied private dwellings with four or more bedrooms
ATUNI	0.43	0.14	% People aged 15 years and over at university or other tertiary institution
HIGHMORTGAGE	0.70	0.23	% Households paying mortgage who pay more than $2,120 per month
HIGHRENT	0.72	0.24	% Households paying rent who pay more than $290 per week
DIPLOMA	0.73	0.24	% People aged 15 years and over with an advanced diploma or diploma qualification
OCC_PROF	0.73	0.24	% Employed people classified as Professionals
BROADBAND	0.79	0.26	% Occupied private dwellings with a broadband Internet connection
INC_HIGH	0.86	0.29	% People with stated annual household equivalised income greater than $52,000 (approx. 9th and 10th deciles)

Removal of highly correlated variables

The initial variable list for the Index of Relative Advantage and Disadvantage contained the variables NOYEAR12 (% People aged 15 years and over whose highest level of schooling completed is Year 11 or lower) and DEGREE (% People aged 15 years and over with a degree or higher qualification).

NOYEAR12 and NOQUAL had a high correlation (0.81), so NOYEAR12 was dropped (as discussed in Section 4.3.1).

DEGREE had high correlations with INC_HIGH (0.81) and OCC_PROF (0.92), and a high negative correlation with NOQUAL (–0.85). This suggests that the proportion of people in an area with a degree is well captured by other variables in the index. Therefore the DEGREE variable was dropped.

The variables OCC_PROF and NOQUAL had a high negative correlation (–0.82). However, as the variables measure different aspects of advantage (occupation and education), and the correlation was only marginally above 0.8, both variables were retained.

Removal of low loading variables

Table 4.5 shows the variables initially considered for the Index of Relative Advantage and Disadvantage, but dropped because of weak loadings. The variables are shown in the order they were removed, with the loadings from the iteration when they were removed.

4.5 Variables removed due to low loadings

Variable mnemonic	Variable loading	Variable description
OCC_SALES_L	–0.16	% Employed people classified as Low Skill Sales Workers
OWNING	0.17	% Households owning the dwelling they occupy (without a mortgage)
ENGLISHPOOR	–0.21	% People who do not speak English well
HIGHCAR	0.22	% Occupied private dwellings with three or more cars
SPAREBED	0.24	% Occupied private dwellings with one or more bedrooms spare (based on Canadian National Occupancy Standard)
OCC_MANAGER	0.24	% Employed people classified as 'Managers'

Variance explained

The eigenvalue for the Index of Relative Advantage and Disadvantage was 9.16. The index explained 44% of the total variance of its 21 input variables. This was slightly higher than the percentage of variance explained by the 2001 Index of Relative Advantage and Disadvantage (41%).

4.3.3 Index of Economic Resources

The Index of Economic Resources focuses on the financial aspects of relative socio-economic advantage and disadvantage, by summarising variables related to income and wealth. The final weights and loadings are shown below in table 4.6.

4.6 Variable loadings and weights

Variable mnemonic	Variable loading	Variable weight	Variable description
INC_LOW	–0.71	–0.31	% People with stated annual household equivalised income between $13,000 and $20,799 (approx. 2nd and 3rd deciles)
ONEPARENT	–0.70	–0.30	% Families that are one parent families with dependent offspring only
NOCAR	–0.69	–0.30	% Occupied private dwellings with no car
RENT_SOCIAL	–0.68	–0.29	% Households renting from a Government or Community organisation
LOWRENT	–0.64	–0.28	% Households paying rent who pay less than $120 per week (excluding $0 per week)
UNEMP_POP_RATIO	–0.62	–0.27	% People aged 15 and over who are unemployed
LONE	–0.58	–0.25	% Households that are lone person households
OVERCROWD	–0.47	–0.20	% Occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard)
OWNING	0.33	0.14	% Households owning the dwelling they occupy (without a mortgage)
UNINCORP	0.45	0.20	% Occupied private dwellings with at least one person who is an owner of an unincorporated enterprise
HIGHMORTGAGE	0.52	0.23	% Households paying mortgage who pay more than $2,120 per month
MORTGAGE	0.55	0.24	% Households owning the dwelling they occupy (with a mortgage)
HIGHRENT	0.55	0.24	% Households paying rent who pay more than $290 per week
INC_HIGH	0.63	0.27	% People with stated annual household equivalised income greater than $52,000 (approx. 9th and 10th deciles)
HIGHBED	0.68	0.29	% Occupied private dwellings with four or more bedrooms

Removal of highly correlated variables

There were no variables considered for the Index of Economic Resources that shared correlations above |0.8|.

Removal of low loading variables

Table 4.7 shows the variables initially considered for the Index of Economic Resources, but dropped because of weak loadings.

4.7 Variables removed due to low loadings

Variable mnemonic	Variable loading	Variable description
IMPDWEL	–0.07	% Occupied private dwelling that are improvised dwellings
GROUP	–0.19	% Households that are group households

Removal of variables during validation process

Table 4.8 shows the variables initially considered for the Index of Economic Resources, but dropped during the index validation process. It became apparent during validation that these variables were causing the index to overestimate people's access to economic resources in rural areas.

4.8 Variables removed during index validation process

Variable mnemonic	Variable description
HIGHCAR	% Occupied private dwellings with three or more cars
FEWBED	% Occupied private dwelling with one or no bedrooms
SPAREBED	% Occupied private dwellings with one or more bedrooms spare (based on Canadian National Occupancy Standard)

A high number of cars per dwelling may represent access to wealth. However, this variable did not account for the number of people in the dwelling, or the value or quality of the cars. It also tended to be highly related to farming and other business activity in rural areas. It was decided that HIGHCAR was not a reliable indicator of access to economic resources in all areas, so this variable was removed from the index.

The housing size variables measure number of bedrooms, but do not necessarily reflect the value of the dwelling or the land. Analysis of correlation structures in urban and rural areas suggested that FEWBED and SPAREBED appeared to be related to life cycle and lifestyle choice rather than access to economic resources. As dwelling size and crowding are already captured by other variables in the index, these two variables were dropped.

Variance explained

The eigenvalue for the Index of Economic Resources was 5.32. The index explained 35% of the total variance of its 15 input variables.

4.3.4 Index of Education and Occupation

The Index of Education and Occupation summarises variables related to educational qualifications and vocational skills. The final loadings and weights for this index are shown below in table 4.9.

4.9 Variable loadings and weights

Variable mnemonic	Variable loading	Variable weight	Variable description
NOYEAR12	–0.88	–0.41	% People aged 15 years and over whose highest level of school completed is Year 11 or lower
NOQUAL	–0.87	–0.40	% People aged 15 years and over with no post-school qualifications
OCC_SKILL5	–0.79	–0.36	% Employed people who work in a Skill Level 5 occupation
OCC_SKILL4	–0.66	–0.31	% Employed people who work in a Skill Level 4 occupation
UNEMPLOYED	–0.50	–0.23	% People (in the labour force) unemployed
CERTIFICATE	–0.50	–0.23	% People aged 15 years and over with a certificate qualification
ATUNI	0.56	0.26	% People aged 15 years and over at university or other tertiary institution
DIPLOMA	0.76	0.35	% People aged 15 years and over with an advanced diploma or diploma qualification
OCC_SKILL1	0.85	0.39	% Employed people who work in a Skill Level 1 occupation

Removal of highly correlated variables

DEGREE (% People aged 15 years and over with a degree or higher qualification) was initially considered for inclusion in the Index of Education and Occupation. However, it shared strong negative correlations with NOQUAL (–0.85) and NOYEAR12 (–0.91). Also, the variables DEGREE, DIPLOMA, CERTIFICATE and NOQUAL are very nearly colinear. In other words, all possibilities for post-school qualifications (apart from non-response) are covered by those four variables. For the above reasons, it was decided that proportion of people with a degree was already well captured in the index, and the DEGREE variable was removed.

The variables NOYEAR12 and NOQUAL share a correlation of 0.81. Both variables are indicators of educational disadvantage. However, this index focuses solely on education and occupation. It was decided that the aspects of education they measure (high school and post-school) are both relevant to the index. Therefore these variables were both retained.

Removal of low loading variables

Table 4.10 below lists the variables that were initially considered for the Index of Education and Occupation but removed because of low loadings. The variables OCC_SKILL2 and NOSCHOOL had loadings of 0.27 and –0.26, respectively. Due to our prescribed minimum loading requirement of |0.3|, for which we had strong theoretical grounds (see Joliffe, 1986, pp. 108, 111), these variables were removed from the index.

4.10 Variables removed due to low loadings

Variable mnemonic	Variable loading	Variable description
ATSCHOOL	–0.01	% People aged 15 years and over who are still attending secondary school
OCC_SKILL2	0.27	% Employed people who work in a Skill Level 2 occupation
NOSCHOOL	–0.26	% People aged 15 years and over who did not go to school

Variance explained

The eigenvalue for the Index of Education and Occupation was 4.69. The index explained 52% of the total variance of its nine input variables. This was higher than the percentage of variance explained by the 2001 Index of Education and Occupation (46%).

5. VALIDATION OF THE INDEXES

The concepts underlying SEIFA are not simple to define or measure precisely. A great deal of thought went into defining these concepts, and selecting variables to summarise them. Therefore it was important to scrutinise the final indexes, to ensure they accurately reflected what we aimed to measure. This section gives an overview of the main methods used to validate the 2006 SEIFA indexes. These are listed below:

- examination of the highest and lowest ranked CDs in each index;

- comparison with SEIFA 2001 and identification of the drivers of change;

- investigation of the correlations between the four indexes;

- consultation with ABS Regional Offices to validate the indexes against local knowledge; and

- consultation with an external group of experts to validate the methodology and variable selection.

Comparison of SEIFA 2006 with other ABS survey data, which also formed a type of validation, is discussed in Section 6.

5.1 Examination of highest and lowest ranked CDs

We identified the ten top and bottom ranked CDs in each index. We looked at the variable proportions for each of these CDs, to observe the characteristics that contributed to the extreme index value. Tables 5.1 and 5.2 list the variable proportions for the bottom five and top five CDs in the Index of Relative Advantage and Disadvantage. The mean proportions for all CDs included in SEIFA are shown for comparison. Variables are listed in order of their weights; from strongest indicators of disadvantage to strongest indicators of advantage. Similar tables for the other indexes are shown in Appendix E.

5.1 Index of Relative Advantage and Disadvantage, variable proportions for bottom five CDs

Variable	CD 1	CD 2	CD 3	CD 4	CD 5	Mean for all CDs
NOQUAL	0.95	0.96	0.92	0.87	0.93	0.50
NONET	1.00	0.97	1.00	1.00	1.00	0.37
INC_LOW	0.93	0.66	0.84	0.60	0.34	0.18
OCC_LABOUR	0.88	0.74	0.77	1.00	0.80	0.12
LOWRENT	1.00	1.00	1.00	1.00	1.00	0.15
DISABILITYU70	0.07	0.01	0.00	0.02	0.05	0.03
OCC_DRIVERS	0.13	0.00	0.00	0.00	0.00	0.07
UNEMPLOYED	0.00	0.57	0.30	0.07	0.64	0.06
ONEPARENT	0.38	0.18	0.06	0.50	0.16	0.09
RENT_SOCIAL	1.00	0.94	0.90	0.71	1.00	0.05
OCC_SERVICE_L	0.00	0.09	0.08	0.00	0.00	0.07
OVERCROWD	0.67	0.63	1.00	0.67	0.30	0.03
NOCAR	0.67	0.94	0.89	1.00	0.70	0.1
HIGHBED	0.00	0.00	0.00	0.00	0.17	0.28
ATUNI	0.00	0.02	0.00	0.00	0.00	0.05
HIGHMORTGAGE	0.00	0.00	0.00	0.00	0.00	0.19
HIGHRENT	0.00	0.00	0.00	0.00	0.00	0.18
DIPLOMA	0.00	0.01	0.00	0.01	0.00	0.08
OCC_PROF	0.00	0.00	0.08	0.00	0.10	0.19
BROADBAND	0.00	0.03	0.00	0.00	0.00	0.39
INC_HIGH	0.00	0.00	0.00	0.00	0.00	0.23

The five lowest ranked CDs have high proportions for most of the disadvantage indicators, and low proportions for all of the advantage indicators. For example, all five CDs have very high proportions of people without qualifications (NOQUAL) or without Internet access (NONET). All five CDs have no people in the highest equivalised income quintile (INC_HIGH). These five CDs are all remote communities with high proportions of Indigenous people, as are many of the lowest ranking CDs in all four indexes.

5.2 Index of Relative Advantage and Disadvantage, variable proportions for top five CDs

Variable	CD 1	CD 2	CD 3	CD 4	CD 5	Mean for all CDs
NOQUAL	0.25	0.23	0.13	0.27	0.23	0.50
NONET	0.17	0.07	0.13	0.14	0.11	0.37
INC_LOW	0.00	0.03	0.00	0.02	0.01	0.18
OCC_LABOUR	0.00	0.01	0.03	0.01	0.02	0.12
LOWRENT	0.00	0.00	0.00	0.00	0.00	0.15
DISABILITYU70	0.00	0.01	0.00	0.00	0.01	0.03
OCC_DRIVERS	0.00	0.01	0.00	0.00	0.01	0.07
UNEMPLOYED	0.00	0.03	0.00	0.03	0.00	0.06
ONEPARENT	0.00	0.02	0.00	0.04	0.02	0.09
RENT_SOCIAL	0.00	0.00	0.00	0.00	0.00	0.05
OCC_SERVICE_L	0.00	0.02	0.00	0.01	0.04	0.07
OVERCROWD	0.00	0.00	0.00	0.01	0.00	0.03
NOCAR	0.00	0.03	0.03	0.04	0.03	0.10
HIGHBED	0.86	0.79	0.00	0.70	0.71	0.28
ATUNI	0.00	0.11	0.07	0.06	0.08	0.05
HIGHMORTGAGE	0.50	0.92	0.33	0.82	0.79	0.19
HIGHRENT	0.00	0.78	0.81	1.00	0.85	0.18
DIPLOMA	0.50	0.10	0.11	0.13	0.11	0.08
OCC_PROF	0.20	0.43	0.79	0.38	0.45	0.19
BROADBAND	0.83	0.91	0.70	0.77	0.78	0.39
INC_HIGH	0.67	0.85	0.91	0.84	0.80	0.23

The top five ranking CDs in the Index of Relative Advantage and Disadvantage are shown below in table 5.3. They have low proportions for the disadvantage indicators and high proportions for the advantage indicators, relative to mean proportions for all CDs. For example, these CDs have almost no people on low incomes (INC_LOW) or working as labourers (OCC_LABOUR). They all have high proportions of people on high incomes (INC_HIGH) or with broadband Internet access (BROADBAND).

5.2 Comparing 2001 and 2006 rankings

We compared the 2006 index rankings with the 2001 rankings at CD level, in order to see how consistent the indexes were and identify any drivers of change. There have been numerous improvements made to SEIFA in 2006, which affect comparability with SEIFA 2001 (these changes are listed in Section 1.2.1).

Only those CDs whose boundaries did not change between 2001 and 2006 were used in the comparisons. This limited the analysis to 31,946 CDs. These comparable CDs made up 90% of the SEIFA 2001 CDs and 85% of the SEIFA 2006 CDs.

Table 5.3 gives a broad overview of how CD decile rankings varied between SEIFA 2001 and 2006, for each index. It shows the percentage of CDs whose ranking changed by 0 to 1, 2 to 5, and more than five deciles. For the Indexes of Relative Disadvantage, Relative Advantage & Disadvantage and Education & Occupation, most CDs (80–90%) did not change deciles or changed by only one decile. The Index of Economic Resources showed considerably more change in CD rankings. Around 40% of the CDs changed by more than one decile in this index, and 2% changed by more than five deciles.

5.3 Percentage of CDs changing deciles from SEIFA 2001 to SEIFA 2006 (a)

Index	CDs moving 0 to 1 deciles (%)	CDs moving 2 to 5 deciles (%)	CDs moving more than 5 deciles (%)
Relative Disadvantage	82.8%	17.0%	0.2%
Relative Advantage & Disadvantage	88.1%	11.8%	0.0%
Economic Resources	60.2%	37.7%	2.1%
Education & Occupation	85.8%	14.0%	0.1%

(a) Analysis limited to CDs that did not change boundary between 2001 and 2006.

We investigated the characteristics of CDs with the greatest change in rank, in order to understand the causes for the change. Some patterns found amongst CDs changing ranks are outlined below:

*   many CDs with large changes in rank had smaller than average populations;

*   some CDs with large changes in rank were populated on Census night by visitors who usually resided elsewhere. These CDs changed rank because of the introduction of usual residence population counts to SEIFA 2006. For example, CDs in the New South Wales ski resort Thredbo ranked much lower in 2006 than in 2001, for all four indexes. Using usual resident counts allows SEIFA to more accurately measure the socio-economic status of the people who usually live in an area; and

- there were more rank changes around the middle of the distributions than at either end. For example, more CDs moved from decile 4 to 6 than from decile 1 to 3. The CDs in the middle of the distribution have much closer scores than the CDs at either end of the distribution (see frequency histograms in Section 6.1). Therefore, it takes less of a change in score for a middle ranking CD to significantly change in rank than for a high or low ranking CD.

We also looked at which new or modified variables contributed to CDs changing ranks. We analysed variable values for the 100 CDs with the greatest change in rank from 2001 to 2006, for each index. For example, figure 5.4 summarises variable values for the 100 CDs with the greatest decrease in rank from 2001 to 2006, for the Index of Relative Disadvantage. It shows the mean for each of the 2006 standardised variables across these 100 CDs. As variables were standardised to a mean of 0 and a standard deviation of 1, a positive standardised value indicates a proportion greater than the average for all CDs.

It is evident that these 100 CDs had high proportions for new disadvantage indicators, such as LOWRENT, DISABILITYU70 and NONET. CDs with these characteristics rank lower in 2006, as these aspects of disadvantage were not measured in 2001. The most decreasing CDs also had many people with low equivalised income (INC_LOW). In SEIFA 2001, the income variables in the Index of Relative Disadvantage only related to families. Low income is better captured in the 2006 index, as the equivalised income variable covers families, lone person households and group households.

**5.4 Index of Relative Disadvantage, 2006 mean standardised variables,
100 CDs with greatest decrease in rank from 2001 to 2006**
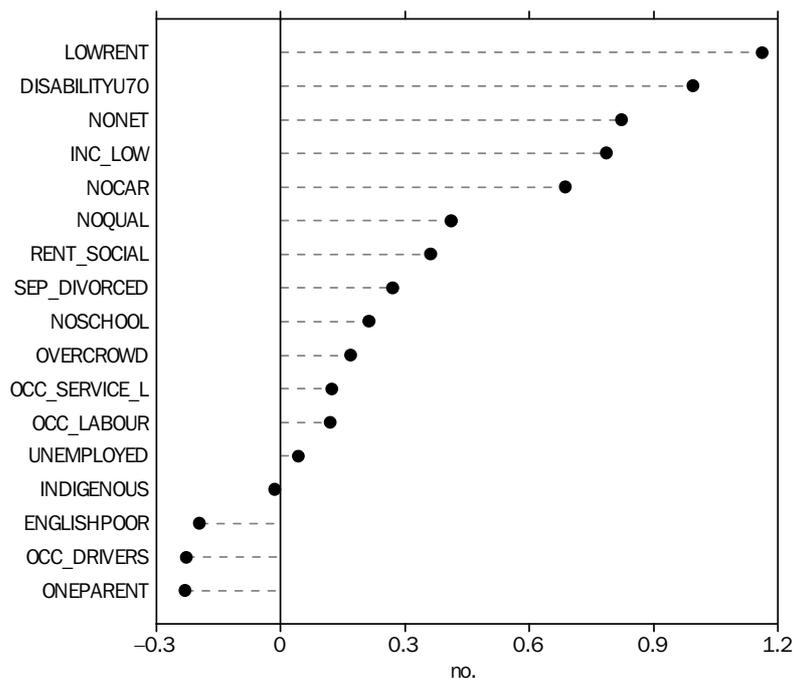
Similar analysis was done for all the indexes. Some new or modified variables contributing to changes in CD ranks for the other three indexes are mentioned below:

Index of Relative Advantage and Disadvantage

Although this index is the most comparable with 2001, there were still a number of new and changed variables that impacted on CD ranks. The new disadvantage indicators mentioned above in the Index of Relative Disadvantage (LOWRENT, DISABILITYU70 and NONET) also had a significant effect on this index. The modification of the public housing variable (RENT_SOCIAL) to include community housing has contributed to some CDs decreasing in rank from 2001. New advantage indicators, particularly the variables relating to broadband Internet access (BROADBAND) and high mortgage repayments (HIGHMORTGAGE) have contributed to some CDs increasing in rank from 2001.

Index of Economic Resources

The 2006 Index of Economic Resources is not comparable with the 2001 index. The 2001 Index of Economic Resources focused heavily on income: 11 out of its 15 variables were income measures for different household types, which were replaced in 2006 by two equivalised household income variables. The 2006 index includes new variables designed to better capture additional types of economic resources, particularly wealth. Many CDs with large increases in rank from 2001 to 2006 had high proportions of people with unincorporated businesses (UNINCORP), or who owned their dwelling without a mortgage (OWNING). Many CDs with large decreases in rank had high proportions of dwellings without cars (NOCAR), lone person households (LONE), or low proportions of people owning their home (MORTGAGE, OWNING). All the variables mentioned above were new to the 2006 index, and reflect aspects of wealth or economic resources that were not captured in SEIFA 2001.

Index of Education and Occupation

This index has also undergone some changes since 2001. Although the education variables are similar, the occupation variables have been reclassified using ANZSCO 2006 (see Section 3.1.4). CDs with large increases in rank tended to have low proportions for the indicators of occupational disadvantage (OCC_SKILL4 and OCCSKILL_5) and high proportions for the indicator of occupational advantage (OCC_SKILL1). The converse was found for CDs with large decreases in rank.

5.3 Relationships between the indexes

We examined SEIFA for internal consistency by comparing CD rankings across the four indexes. The rank correlation matrix, shown in table 5.5, shows that all correlations are in the expected directions and show significant relationships. The Index of Relative Disadvantage is very highly correlated with the Index of Relative Advantage and Disadvantage (0.94). These two indexes measure similar concepts, the main difference being the inclusion of advantage indicators in the Index of Relative Advantage and Disadvantage.

5.5 Spearman's rank correlation matrix

Index	Index of Relative Disadvantage	Index of Relative Advantage and Disadvantage	Index of Economic Resources	Index of Education and Occupation
Relative Disadvantage	1.00			
Relative Advantage & Disadvantage	0.94	1.00		
Economic Resources	0.92	0.82	1.00	
Education and Occupation	0.80	0.89	0.61	1.00

The indexes which measure specific dimensions of relative advantage and disadvantage (i.e. the Index of Economic Resources and the Index of Education and Occupation) have a lower correlation with the other indexes. The Index of Economic Resources includes variables chosen to capture high and low wealth, which are not included in the other indexes. The Index of Education and Occupation focuses solely on educational qualifications, employment and vocational skills.

The Index of Economic Resources and the Index of Education and Occupation are positively correlated, but the correlation is weaker than between the other indexes (0.61). There is a significant difference between the concepts measured by these two indexes, and they do not share any common variables.

5.4 ABS Regional Office validation

The top ten and bottom ten CDs in each index were inspected by ABS Regional Offices to confirm whether they aligned with local knowledge. The five CDs with the greatest increase in rank since 2001, and the five CDs with the greatest decrease, were also inspected by the Regional Offices.

The highest and lowest ranking CDs largely agreed with the expectations of the Regional Office analysts. The tendency of remote Indigenous communities to rank among the most disadvantaged CDs in many States and Territories was noted as being an accurate reflection of reality. Although some CDs were found to have surprisingly high or low ranks, these areas were scrutinised with respect to the underlying variables

and found to have advantaging or disadvantaging characteristics that justified their SEIFA indexes. Regional Offices questioned the reliability of indexes for some CDs with very small populations. These were CDs with populations slightly above our criteria for inclusion (more than ten people and five dwellings). The exclusion criteria, discussed in Section 4.2.3, were designed to strike a balance between providing SEIFA scores for as many areas as possible, while ensuring all scores are meaningful. These criteria will be further analysed post-release to inform future editions of SEIFA.

The Regional Offices highlighted numerous causes for CDs changing rank between 2001 and 2006. Some of the CDs increasing in rank were in areas experiencing recent economic growth. A common cause of increase or decrease was a difference between the Census Night and usual residence population count, as discussed above in Section 5.2.

Regional Offices raised concerns that some rural areas were being portrayed as unrealistically advantaged by the Index of Economic Resources. We conducted further analysis to understand which variables were responsible for this anomaly, and subsequently modified the index (for more information see Section 4.3.3).

5.5 External peer review

An external group of experts reviewed the variables and methodology used in SEIFA 2006. The panel members were drawn from academia and policy research areas and were skilled in socio-economic modelling and analysis. Each of them was also an experienced user of SEIFA.

The panel was generally supportive of the 2006 methodology, including the major changes to using usual residence counts and equivalised income. The group provided many valuable comments on the methodology, concepts and variables. Some of the suggestions relating to the choice of variables and the content of the publications were able to be incorporated into SEIFA 2006. However, due to time constraints, much of the feedback will be addressed post-release, and where appropriate, may be used to improve future SEIFA indexes. A few of the areas where further analysis may be done to improve future editions of SEIFA are:

- investigating current developments and frameworks in the socio-economic literature, in order to further inform the concepts of relative advantage and disadvantage underlying SEIFA;

- further investigating transformation of skewed variables to normalise the distribution of the indexes; and

- considering whether a simplified index can be produced for multiple Census years, in order to allow meaningful longitudinal comparisons.

6. USING SEIFA

This section provides an introduction to the use of SEIFA. We provide examples of analysis using the indexes' distributional properties, provide sample maps to convey relative disadvantage visually, and use SEIFA to demonstrate relationships between area level socio-economic status and health.
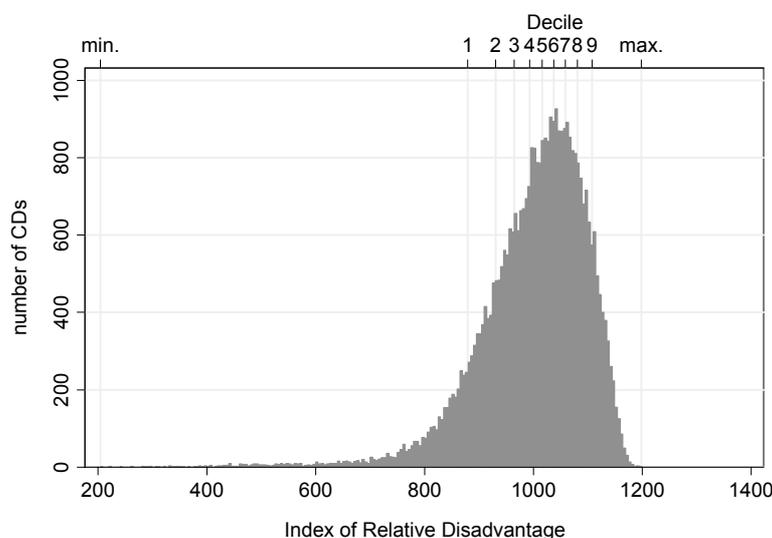
6.1 Distribution of the indexes

This section explores the frequency distributions of the SEIFA indexes at CD level. The distributions differ slightly between the indexes, because of the different variables that make up each index.

6.1.1 Index of Relative Socio-economic Disadvantage

Figure 6.1 shows the frequency distribution for the Index of Relative Disadvantage. Each vertical bar represents the number of CDs within a range of five index points. The distribution has a very long left tail, and is slightly left-skewed (i.e. the mean is lower than the median). The values range from around 200 to around 1200. The left slope is less steep than the right slope, meaning the scores of relatively disadvantaged areas are more spread out than the scores of areas with little disadvantage. This is because the index contains only disadvantage indicators, meaning there is more scope to distinguish between disadvantaged areas. The decile cut-offs (marked along the top axis), show that there is not much difference in the scores of CDs in the middle deciles. This means that the CDs in the middle deciles do not vary much in terms of the indicators of disadvantage used. The discriminating power of this index lies in the lower end of the distribution, i.e. for identifying relatively disadvantaged CDs.

6.1 Index of Relative Disadvantage distribution

6.1.2 Index of Relative Socio-economic Advantage and Disadvantage

The Index of Relative Advantage and Disadvantage distribution is shown below in figure 6.2. It has a long left tail, but the tail is not as long as the Index of Relative Disadvantage. The scores range from around 500 to around 1300. The right slope is not as steep as the Index of Relative Disadvantage, and there is more space between the higher decile cut-offs, meaning the scores of CDs in the upper half of the distribution are more spread out. This index is more appropriate than the Index of Relative Disadvantage for users who want to compare the entire range of areas, rather than focusing on relatively disadvantaged areas only.

6.2 Index of Relative Advantage and Disadvantage distribution
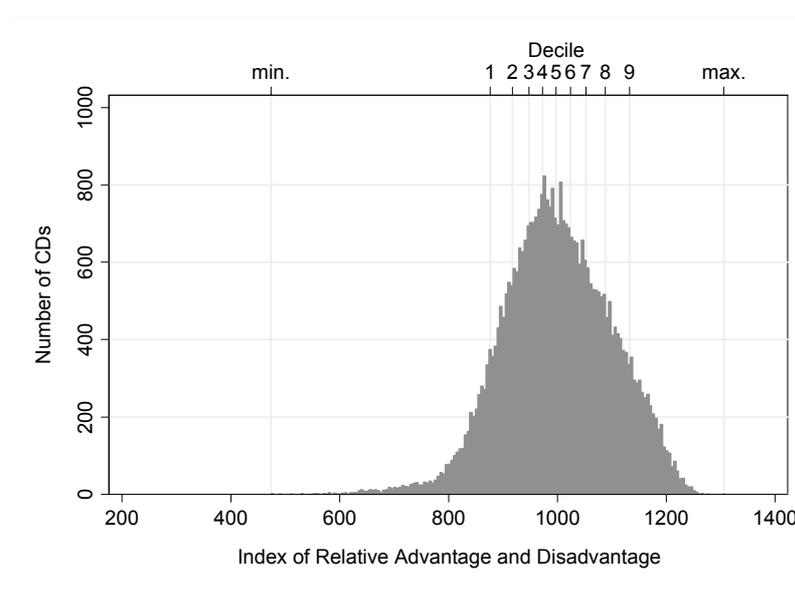
6.1.3 Index of Economic Resources

The Index of Economic Resources, shown below in figure 6.3, is the most normally distributed of the four 2006 indexes. It also has the largest range of scores: the lowest is under 300 and the highest is above 1250. Again, the decile cut-offs in the middle of the distribution are much closer than those at either end, meaning it is easier to distinguish between CDs with relatively high advantage or disadvantage than between mid-ranking CDs. This index can be used to compare all areas in terms of their access to economic resources, such as income and wealth.

6.3 Index of Economic Resources distribution
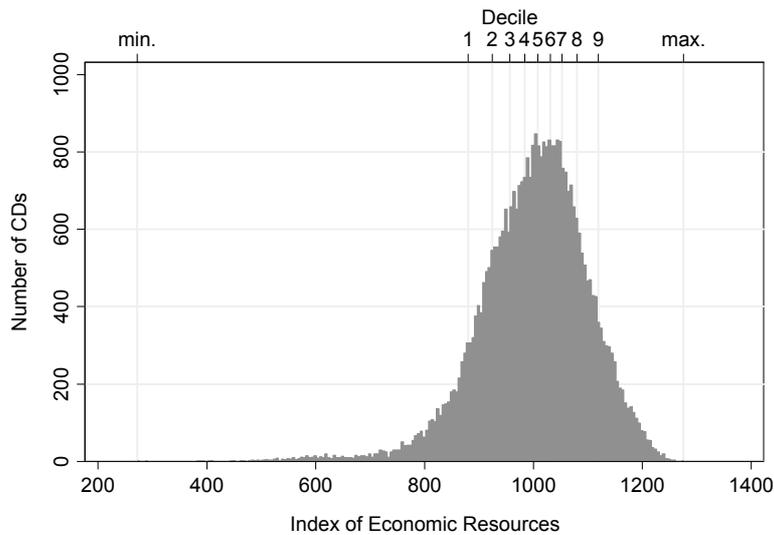
6.1.4 Index of Education and Occupation

The Index of Education and Occupation values range from around 600 to around 1350. The distribution is slightly right-skewed, and the scores of areas in the upper deciles are more spread out than the scores of areas in the lower deciles. Of the four index distributions, the distribution of this index is the least smooth, largely because it contains the least number of variables. The Index of Education and Occupation can be used to compare the entire range of areas in terms of people's educational qualifications and vocational skills.

6.4 Index of Education and Occupation distribution
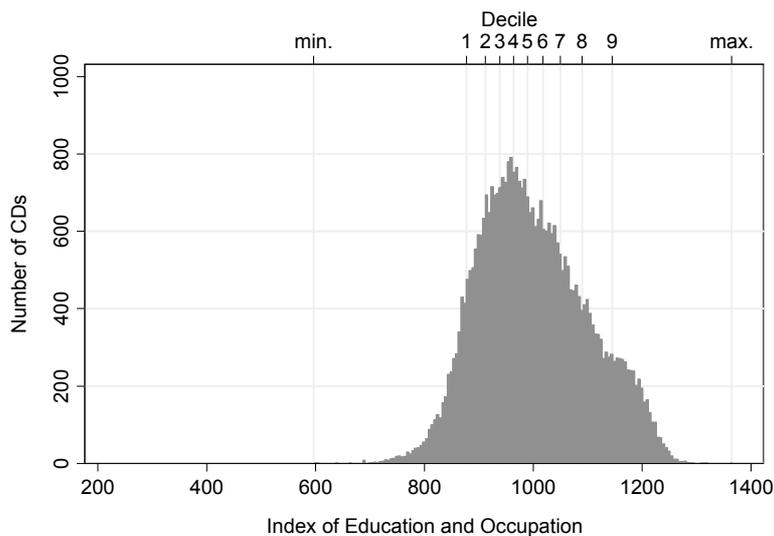
6.2 Distributional analysis of SEIFA scores

The CD was the basic unit of analysis used to create SEIFA. The variable weights were calculated using CD level data. Therefore the indexes are most accurate when applied at CD level. Indexes for larger areas were constructed by taking weighted means of the CDs within these areas.

In previous editions of SEIFA, indexes were created for various geographic levels larger than the four levels created in 2006 (i.e. CD, POA, SLA and LGA). However, it is not meaningful to assign a single index to a very large area, which may contain many CDs of varying socio-economic status. Instead, we recommend comparing larger areas using the distribution of the CDs within the areas.

In this section we compare the distribution of relative socio-economic advantage and disadvantage across States and Territories, using the Index of Relative Advantage and Disadvantage at CD level.

Boxplots are a simple method of visually comparing distributions. They present the median, upper and lower quartiles, and range of the distribution as shown below:

6.5 Boxplot description
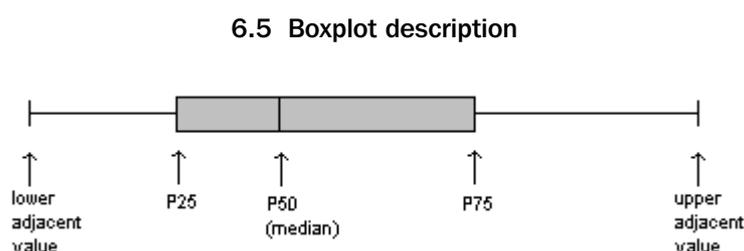
The upper and lower adjacent values are calculated using the interquartile range (IQR), which is the difference between the upper and lower quartile values (P75–P25). For example, the upper adjacent value is the largest value within 1.5 IQRs of the upper quartile. Values outside the upper and lower adjacent values ('outside values') are not shown.

Figure 6.6 uses boxplots to compare the distribution of the Index of Relative Advantage and Disadvantage across the States and Territories. It is evident that the Australian Capital Territory has the highest median score, as well as the highest quartile values. On this basis we could say that the Australian Capital Territory is the most advantaged of the States and Territories. New South Wales, Victoria and Western Australia have similar medians, but New South Wales has a wider range of scores than the other two. It is clear that New South Wales contains some very advantaged CDs as well as some very disadvantaged CDs. Tasmania has the lowest median score, but the range of the Northern Territory scores extends much lower. The most disadvantaged CDs in the Northern Territory are also the most disadvantaged CDs in Australia.

6.6 Index of Relative Advantage and Disadvantage, Distribution by State/Territory

Index of Relative Advantage and Disadvantage
excludes outside values
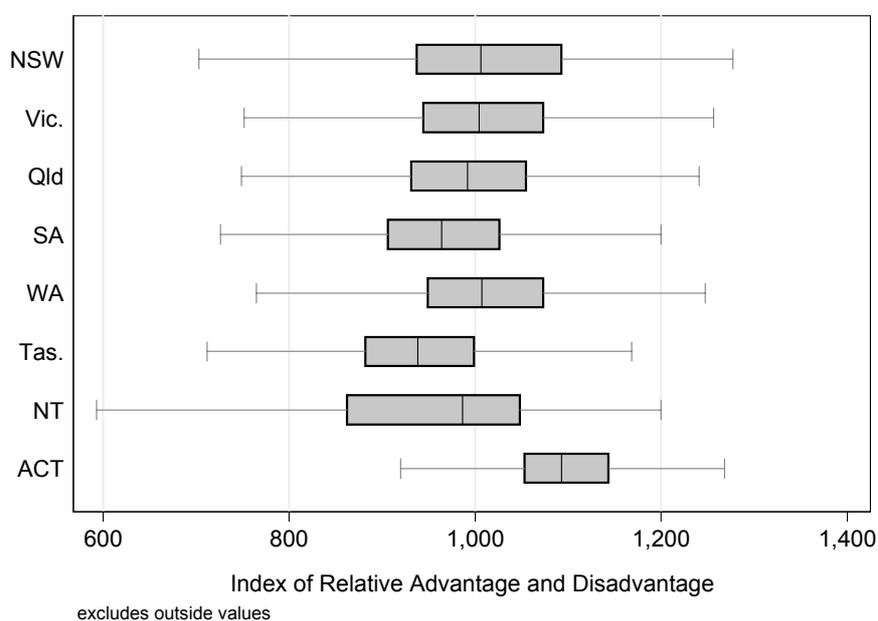
As discussed in Section 6.1, the discriminatory power of SEIFA is greatest at the extremes of the distributions. Therefore, it is often useful to look at CDs in the top and bottom SEIFA deciles. Figures 6.7 and 6.8 show the percentage of CDs in each State and Territory that are in the top and bottom decile for Australia. A figure greater than 10% in a particular State or Territory indicates that there are a high proportion of relatively advantaged (or disadvantaged) CDs in that State or Territory.

6.7 Index of Relative Advantage and Disadvantage, % CDs in top decile, by State/Territory
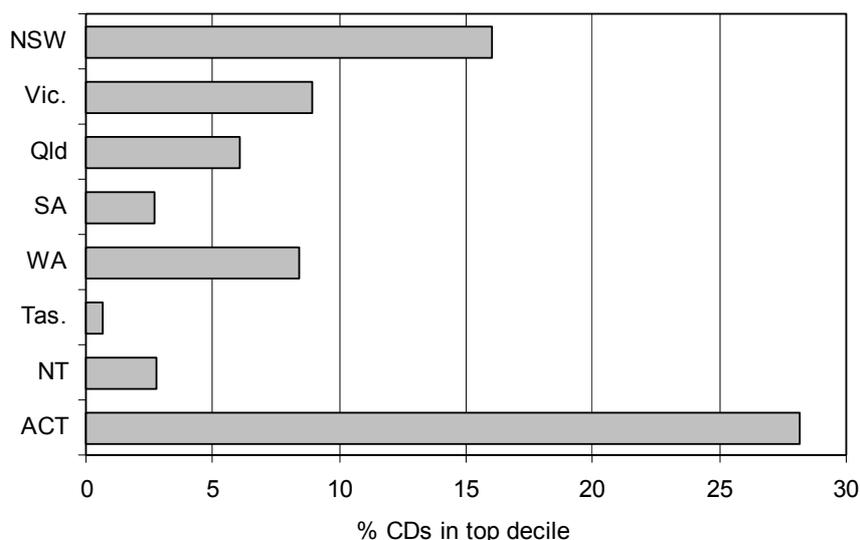
28% of CDs in the Australian Capital Territory are in the top decile for Australia. New South Wales also has a high proportion of CDs (16%) in the top decile. It is worth pointing out that in absolute terms, New South Wales has a much greater number of CDs in the top decile than ACT (1892 compared to 147). The very advantaged CDs are underrepresented in South Australia and Northern Territory, and particularly in Tasmania. Less than 1% of CDs in Tasmania are in the top decile for Australia.

6.8 Index of Relative Advantage and Disadvantage, % CDs in bottom decile, by State/Territory
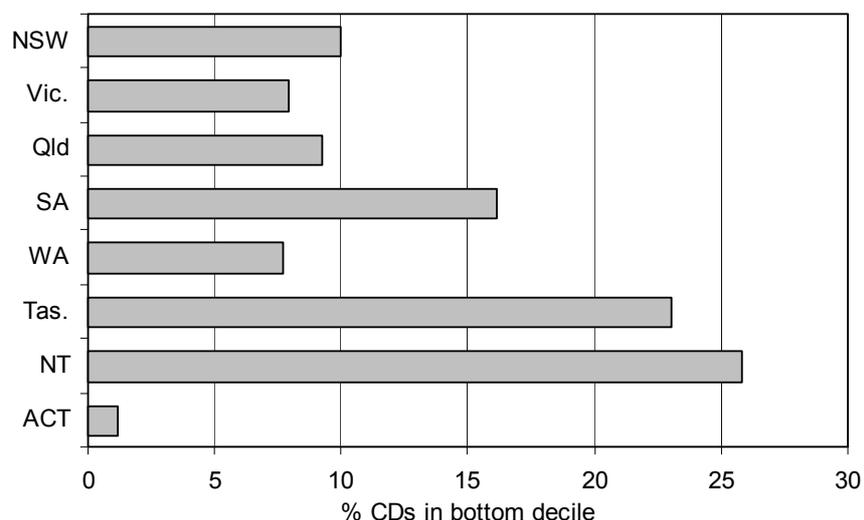
It is clear that the Australian Capital Territory has a very low proportion of relatively disadvantaged CDs. Northern Territory and Tasmania, on the other hand, have a high proportion of relatively disadvantaged CDs. Over 25% of CDs in Northern Territory are in the bottom decile for Australia.

6.3 Mapping SEIFA

Maps are useful to observe the geographic distribution of relative socio-economic advantage and disadvantage. Map 6.9 shows the distribution of relative disadvantage in Sydney. Each Statistical Local Area (SLA) is shaded according to its Index of Relative Disadvantage quintile.[17] Darker shading indicates a greater level of disadvantage. The quintiles are based on all SLAs in Australia; the legend shows the number of Sydney SLAs in each quintile. Overall, Sydney has a relatively low proportion of relatively disadvantaged SLAs, with only eight SLAs in the bottom quintile and 23 SLAs in the top quintile for the Index of Relative Disadvantage.

We can see that areas of high or low disadvantage tend to be clustered together. For example, many SLAs in the western suburbs have relatively high levels of disadvantage, while central Sydney and the northern suburbs have very low levels of disadvantage.

6.9 Index of Relative Disadvantage quintiles by SLA, Sydney

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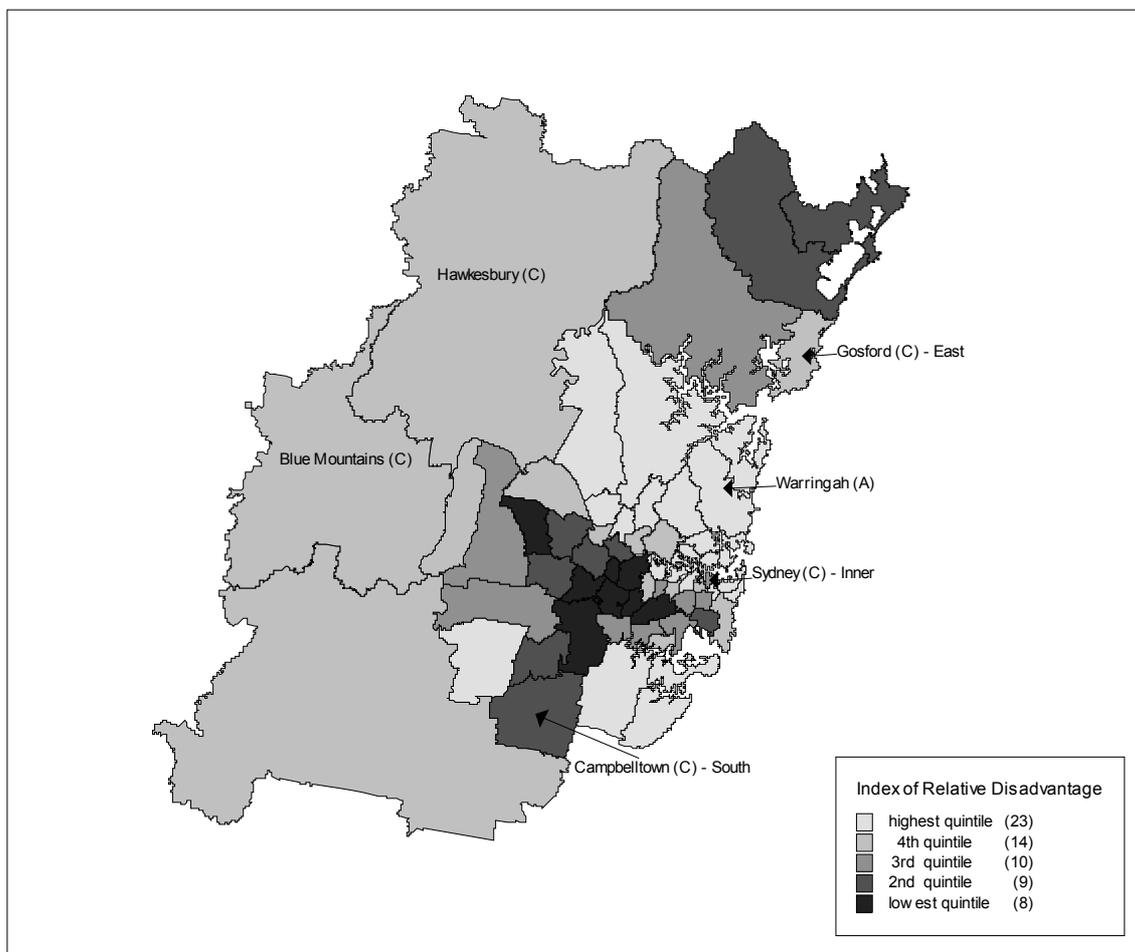
17 SLA indexes were calculated using population weighted averages of the underlying CDs, as discussed in Section 4.1.2.

Map 6.10 shows the geographic distribution of relative socio-economic advantage and disadvantage in Melbourne, using the Index of Relative Advantage and Disadvantage. Dark shading indicates disadvantage and light shading indicates advantage. Melbourne has relatively low levels of disadvantage and high levels of advantage. For example, 27 SLAs in Melbourne are in the top national quintile for the Index of Relative Advantage and Disadvantage, while only five are in the bottom quintile. The SLAs around the centre of Melbourne have relatively high levels of advantage, as do the SLAs in the inner eastern and south-eastern suburbs. There are some relatively disadvantaged SLAs further out in the south-eastern and north-western suburbs. Other capital city maps also showed areas of high advantage around the city centre, with more disadvantaged areas on the outskirts.

6.10 Index of Relative Advantage and Disadvantage quintiles by SLA, Melbourne
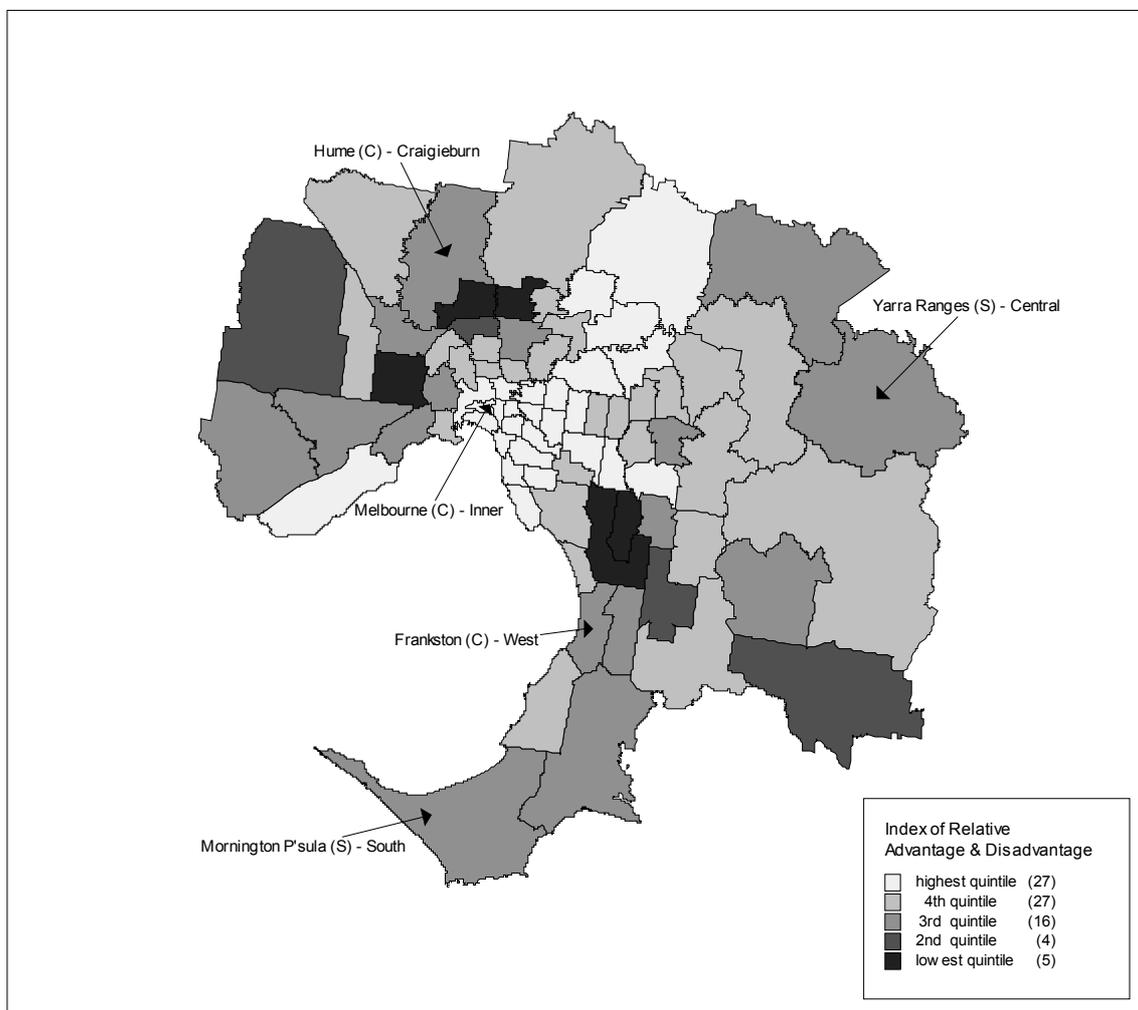
6.4 Comparing SEIFA with health indicators

In this section we provide simple examples of how SEIFA can be used in social analysis. We investigate how self-reported health status, smoking, body mass index and mental health status are related to SEIFA deciles for CDs where people live. [18] The health data used are from the ABS *National Health Survey, 2004–05* (NHS). [19]

6.4.1 Self-reported health status

When asked to select from the categories 'excellent', 'very good', 'good', 'fair' and 'poor', just over 17% of survey respondents reported that their health was 'fair' or 'poor'. We examined the Index of Economic Resources for the CDs in which these respondents lived. We did not choose the Index of Relative Disadvantage or the Index of Relative Advantage and Disadvantage to compare with self-reported health, as these indexes contain the disability variable. The Index of Economic Resources measures the financial aspects of socio-economic status, independent of health indicators. Figure 6.11 below shows the proportion of respondents reporting fair/poor health, by Index of Economic Resources decile. It shows that people who live in areas in the lowest decile are much more likely to report fair/poor health than those living in areas in the highest decile. There is also a reasonably consistent gradient across the deciles; as areas become relatively more disadvantaged with respect to access to economic resources, the proportion of respondents reporting fair/poor health increases.

6.11 Proportion of people reporting fair/poor health, by Index of Economic Resources decile


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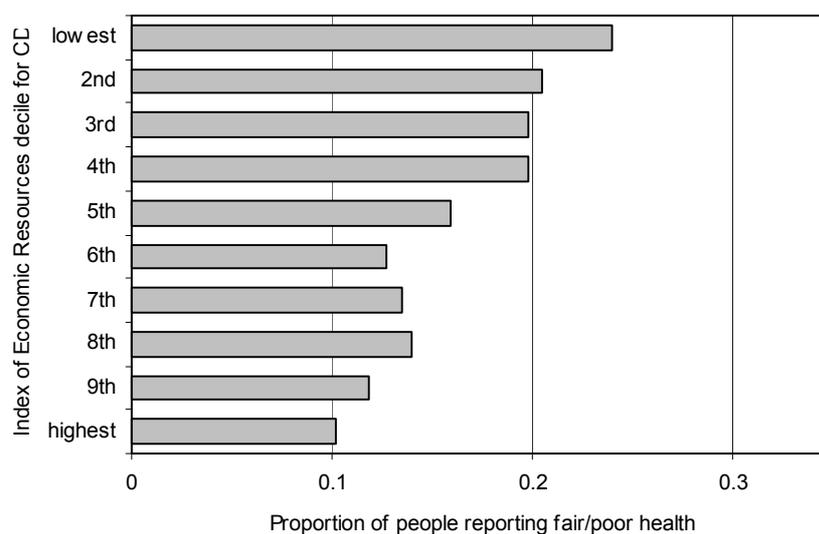
18 For each of the four health indicators, we have included analysis using a different SEIFA index. All four indexes showed relationships with all four health indicators examined.

19 For more information see *National Health Survey: Summary of Results, 2004–05*, ABS cat. no. 4364.0.

6.4.2 Smoking

Smoking is a key risk factor for cancer and heart disease, and is widely considered to be the largest preventable cause of death and disease in Australia (The Cancer Council Australia, 2007). The NHS asked adults (aged 18 years and over) questions about smoking. Figure 6.10 below shows the proportion of respondents who smoked at least once a day, for each Index of Relative Disadvantage decile. The graph shows a clear relationship between smoking and area level socio-economic disadvantage. The proportion of daily smokers in the lowest decile is almost three times the proportion in the highest decile. There is a trend across deciles: as areas become relatively more disadvantaged, the prevalence of regular smokers increases.

6.12 Proportion of adults who smoke daily, by Index of Relative Disadvantage decile
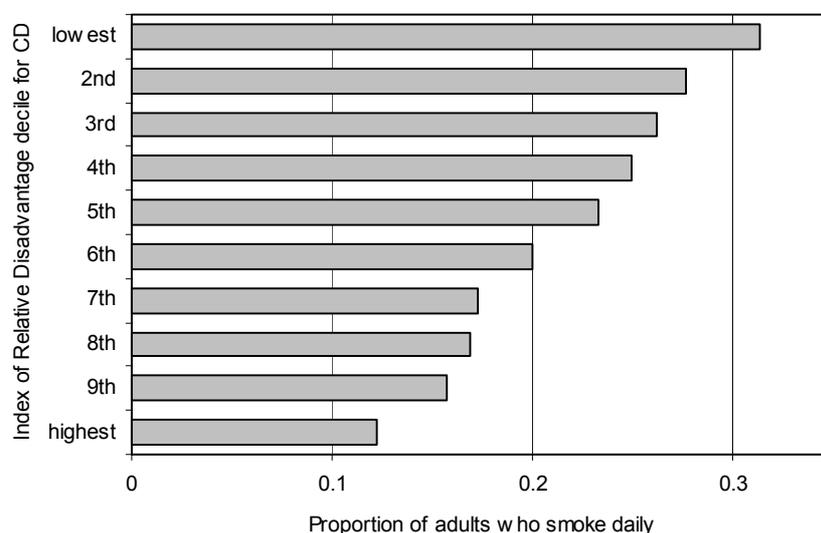
6.4.3 Mental health status

Mental health status was measured using 10 questions based on the Kessler Psychological Distress Scale (for more information see Kessler and Mroczek, 1994). The survey estimated that around 13% of Australian adults had a 'high' or 'very high' mental distress level. Figure 6.11 below shows the prevalence of 'high' or 'very high' mental distress, classified by Index of Relative Advantage and Disadvantage deciles for respondents' CDs. It is evident that the prevalence of high mental distress is much greater than average in the most disadvantaged decile (22%) and much lower in the most advantaged decile (6%). Although a relationship is evident across all the deciles, it is most marked in the top and bottom deciles. Note that this analysis does not show whether relative socio-economic disadvantage contributes to mental distress, whether mental distress contributes to relative socio-economic disadvantage, or whether there are other factors underlying both outcomes.

6.13 Proportion of adults with 'high' or 'very high' mental distress, by Index of Relative Advantage and Disadvantage decile
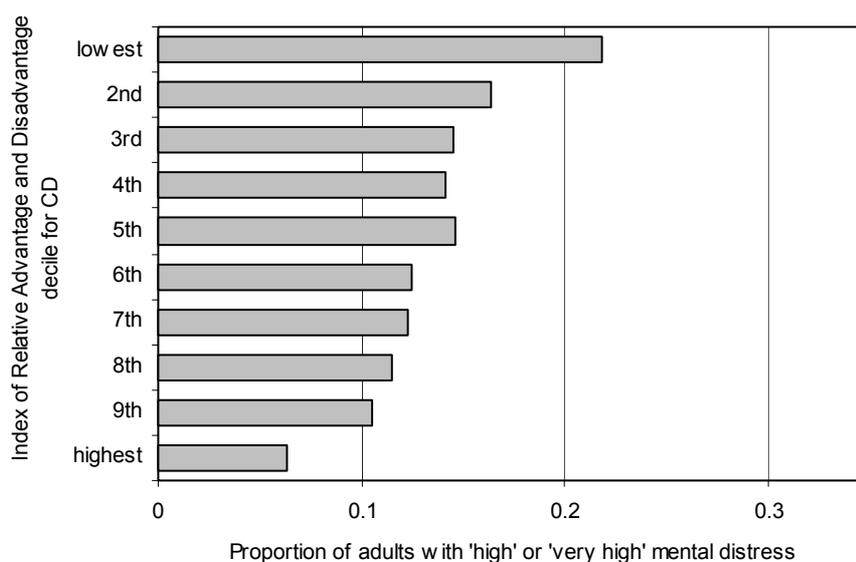
6.4.4 Body Mass Index

Obesity poses a major risk to long term health by increasing the risk of chronic illness (World Health Organisation, 2003). Body Mass Index (BMI) provides a general indication of whether a person is within a healthy weight range, based on their height and weight. Respondents' self-reported height and weight were collected in the *National Health Survey* and used to calculate BMI. NHS results estimated a 17% obesity rate (defined as BMI>30) amongst Australians aged 15 and over. Figure 6.13 shows that obesity levels of CDs in the lowest Index of Education and Occupation decile are much higher (25%). It is evident that as areas increase in level of education and occupation skill, the prevalence of obesity decreases.

6.14 Proportion of people classified as obese, by Index of Education and Occupation decile

Proportion of people classified as obese
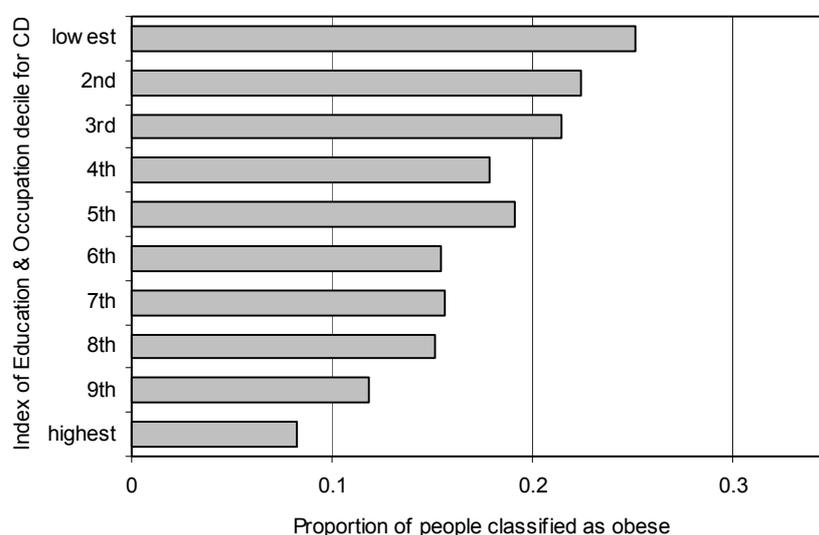
The above analysis has demonstrated that relationships exist between area level socio-economic advantage/disadvantage and physical/mental health status, smoking and obesity. Such relationships are already well established (see for example, AIHW, 2006, Section 4.6).

We have used each of the four SEIFA indexes in one of the comparisons. Depending on the aim or context of the analysis, one of the SEIFA indexes may be more appropriate than the others. It may also be the case that none of the SEIFA indexes are appropriate. Socio-economic analysis could be based on a number of simpler measures, such as people's incomes or employment status. Users should consider the variables underlying each index before deciding whether SEIFA is suitable for their particular research question.

REFERENCES

Australian Bureau of Statistics (1997) *ASCO – Australian Standard Classification of Occupations, Second Edition*, cat. no. 1220.0, ABS, Canberra.

—— (2001) *Australian Standard Classification of Education (ASCED)*, cat. no. 1272.0, ABS, Canberra.

—— (2003) *Population Characteristics, Aboriginal and Torres Strait Islander Australians, 2001*, cat. no. 4713.0, ABS, Canberra.

—— (2004) *Census of Population and Housing: Socio-Economic Indexes for Area's (SEIFA), Australia – Technical Paper., 2001,* cat. no. 2039.0.55.001, ABS, Canberra.

—— (2006a) *ANZSCO – Australian and New Zealand Standard Classification of Occupations, First Edition*, cat. no. 1220.0, ABS, Canberra.

—— (2006b) *National Health Survey: Summary of Results, 2004–05*, cat. no. 4364.0, ABS, Canberra.

—— (2006c) *Statistical Geography: Volume 2 – Census Geographic Areas, Australia*, cat. no. 2905.0, ABS, Canberra

—— (2006d) *Census Dictionary, 2006 (Reissue),* cat. no. 2901.0, ABS, Canberra.

—— (2007a) *Australian Standard Geographic Classification (ASGC)*, cat. no. 1216.0, ABS, Canberra.

—— (2007b) *Household Income and Income Distribution, Australia, 2005–06,* cat. no. 6523.0, ABS, Canberra.

—— (2007c) *Housing Occupancy and Costs, Australia, 2005–06,* cat. no. 4130.0.55.001, ABS, Canberra.

—— (2007d) *Australian Social Trends, 2007,* cat. no. 4102.0 ABS, Canberra.

—— (2008) *Information Paper: An Introduction to Socio-economic Indexes for Areas, 2006*, cat. no. 2039.0, ABS, Canberra.

Australian Institute of Health and Welfare (2006) *Australia's Health 2006*, Cat. No. AUS 73, AIHW, Canberra.

Baker, J. and Adhikari, P. (2007) "Socio-Economic Indexes for Individuals and Families", *Methodology Advisory Committee Papers*, cat. no. 1352.0.55.086, Australian Bureau of Statistics, Canberra.

Bailey, N.; Flint, J. et al. (2003) *Measuring Deprivation in Scotland: Developing A Long-Term Strategy*, Scottish Centre for Research on Social Justice, Universities of Glasgow and Aberdeen.

Department of the Treasury (2004) "Policy advice and Treasury's wellbeing framework", *Economic Roundup,* Winter 2004, Department of the Treasury, Canberra, pp. 1–20.

Dudzinski, M.L.; Norris, J.M.; Chmura, J.T. and Edwards, C.B.H. (1975) "Repeatability of Principal Components in Samples: Normal and Non-Normal Data Sets Compared", *Multivariate Behavioural Research*, 10(1), pp. 109–117.

Henderson, R.F. (Chairman) (1975) *Commission of Inquiry into Poverty: Poverty in Australia, First Main Report*, Australian Government Publishing Service, Canberra.

Joliffe, I.T. (1986) *Principal Components Analysis*, Springer–Verlag, New York.

Kessler, R. and Mroczek, D. (1994) *Final Versions of our Non-Specific Psychological Distress Scale*, University of Michigan, Michigan.

Krieger, N.; Zierler, S.; Hogan, J.W.; Waterman, P.; Chen, J.T.; Lemieux, K. and Gjelsvik, A. (2003) "Geocoding and Measurement of Neighborhood Socioeconomic Position: A U.S. Perspective", in Kawachi, I. and Berkman, L. (eds), *Neighborhoods and Health*, Oxford University Press, Oxford, pp. 147–178.

O'Rourke, N.; Hatcher, L. and Stepanski, E.J. (2005) *A Step-by-Step Approach to Using SAS for Univariate and Multivariate Statistics, Second Edition*, SAS Institute Inc., Cary, NC.

Noble, M.; Wright, G. et al. (2004) *The English Indices of Deprivation*, Office of the Deputy Prime Minister, London.

Salmond, C. and Crampton, P. (2002) *NZDep2001 Index of Deprivation*, Department of Public Health, Wellington School of Medicine and Health Science, Wellington, New Zealand.

The Cancer Council Australia (2007) *Smoking and Tobacco Control*, viewed January 2008,
<http://www.cancer.org.au/Healthprofessionals/PositionStatements/smokingtobaccocontrol.htm>

Townsend, P. (1979) *Poverty in the United Kingdom. A Study of Household Resources and Standards of Living*, Penguin Books, Harmondsworth.

Walker, R. and Hiller, J.E. (2005) "Index of Relative Socio-economic Disadvantage: General population views on indicators used to determine area-based disadvantage", *Australian and New Zealand Journal of Public Health*, 29(5), pp. 442–447.

World Health Organisation (2003) *Obesity and Overweight: WHO Global Strategy on Diet, Physical Activity and Health*, WHO, Geneva.

APPENDIXES

A. THE 2006 INDEX OF ECONOMIC RESOURCES

Background

Between 2001 and 2006, the Index of Economic Resources (IER) has undergone the most significant change of all SEIFA indexes. The 2001 Index of Economic Resources focused heavily on income – in fact 11 of its 15 variables were income measures for different family types. The change from family income to household equivalised income, described in Section 3.1.2, meant that these 11 variables would replaced with two equivalised income variables. This allowed us to review and revise the IER using a range of additional variables which are associated with economic resources.

Concept of economic resources

In the IER we attempt to capture "access to economic resources". The material wellbeing, including the level of consumption possibilities, of individuals and households will be largely determined by their access to economic resources in the form of income and wealth. Economic resources may also help to provide the capacity for an individual to choose the lives they want to live and the level of risk they bear.[20] However, other factors such as non-market services provided by the government and other non-profit sectors (including voluntary organisations) can also be significant aspects of material wellbeing.

As with all other SEIFA indexes, IER is a relative measure. We are aiming to capture the wealth of an area relative to other areas in Australia, rather than the absolute level of wealth in an area.

Reviewing the 2001 Index

The relationships between the elements of economic resources – particularly income and wealth – are very complex. However, a measure which uses indicators of both income and wealth will be superior to those using income or wealth alone. In the development of the 2001 IER, 25 indicators of income and wealth were initially included in the index:

- 12 variables indicating high or low income by family type;
- 3 variables indicating housing payments; and
- 10 variables which were believed to indicate wealth.

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20 Based on the Wellbeing Framework produced by the Department of the Treasury (2004).

In the final index, 11 income variables and all of the housing payment variables were retained. However, only one of the 'wealth' variables was retained. This suggests that the 2001 IER was lacking a wealth dimension. In the revision of the IER for SEIFA 2006, we aimed to create a measure which included indicators of both income and wealth.

Finding "new variables"

To create a wealth dimension we needed to identify 2006 Census data items which were associated with both high and low wealth. We identified potential variables through an analysis of net worth (defined as asset value minus liability value, and often used in practice to measure wealth) using the 2003–04 ABS *Survey of Income and Housing*. However, before any variable was included in the 2006 IER we carefully considered whether the variable had:

- a strong conceptual relationship with wealth (as defined by net worth);

- a conceptual relationship with alternative definitions of wealth; and

- any explanatory power beyond other variables included in the index (especially income).

If the variable met these criteria, it was added to the initial variable list described in Section 4.1.2.

As with any analysis, there were limitations associated with selecting variables in the fashion described above. These limitations include:

- the complex and multidimensional nature of wealth. This makes wealth a difficult concept to capture, particularly with the type of variables available on the Census;

- a range of issues in using the concept of net worth to measure wealth;

- limited information on wealth available in the Census. For example, the Census collects very little information on monetary values apart from limited information on income and rent/mortgage payments; and

- concepts within "access to economic resources" that remain uncaptured, such as information on living standards, locational variation and access to infrastructure.

Relationship with wealth

Once the 2006 IER had been created, we were able to investigate the relationship between the IER and household net wealth in the 2005–06 ABS *Survey of Income and Housing*. Figure A.1 shows the distribution of household net wealth, when respondent households in the survey are classified according to the IER decile for their CD. Although there appears to be some heteroscedasticity, figure A.1 does show quite a strong positive relationship between household net wealth and the IER for the CD.

A.1 Boxplot of household net wealth by Index of Economic Resources decile

excludes outside values

IER decile for CD
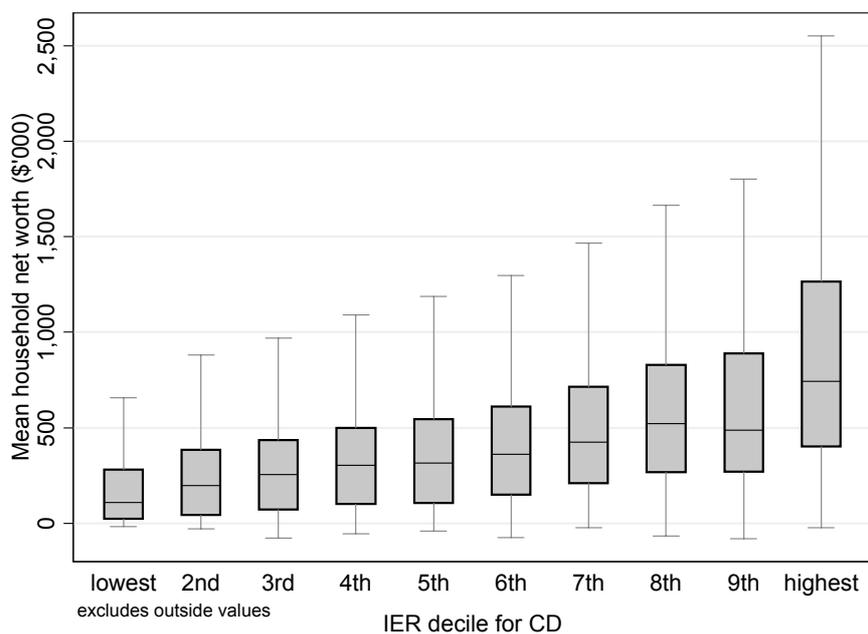
Changes to the index

The revision of the 2006 IER, and the inclusion of a range of new Census data items mean that the 2006 IER is very different from its 2001 predecessor. Figure A.2 shows the distribution of scores for the 2001 and 2006 IER. The distributions are strikingly different. In 2001, the distribution was quite strongly skewed to the right – especially when compared to other 2001 indexes. In 2006, the distribution is more evenly distributed.

A.2 Distribution of Index of Economic Resources scores, 2001 and 2006
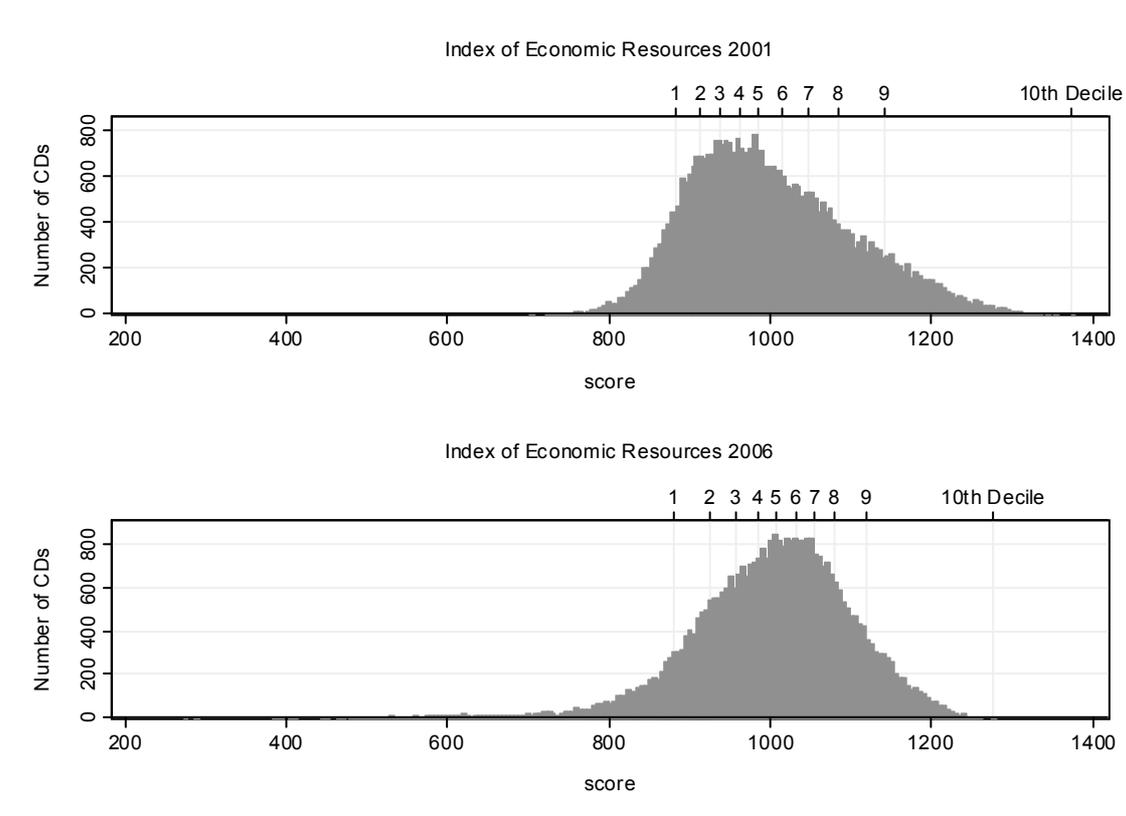
B. RELATIONSHIPS BETWEEN SEIFA AND AGE

This appendix discusses the relationships between the SEIFA indexes for a CD and the age of its residents. We provide some examples of SEIFA variables that are influenced by age, and explain why we decided not to adjust variables to account for age in most cases.

B.1 Comparing SEIFA with age

Figures B.1–B.4 below show the percentage of residents in five broad age groups, for areas in various SEIFA deciles. Figure B.1 compares the highest and lowest deciles of the Index of Relative Disadvantage with all CDs included in SEIFA. Figure B.2 is for the Index of Relative Advantage and Disadvantage. Similar patterns are evident for both of these indexes. The 30–49 year age group is overrepresented in the highest decile, and underrepresented in the lowest decile, for both indexes. This makes sense, considering that people aged 30–49 years are likely to be in the workforce, and therefore have relatively high incomes and levels of education. People aged 70 years and over are underrepresented in the highest deciles and overrepresented in the lowest deciles, in both indexes. These people are more likely to have lower incomes, lower levels of education and less access to Internet than younger age groups.

B.1 Index of Relative Disadvantage, % people by age group
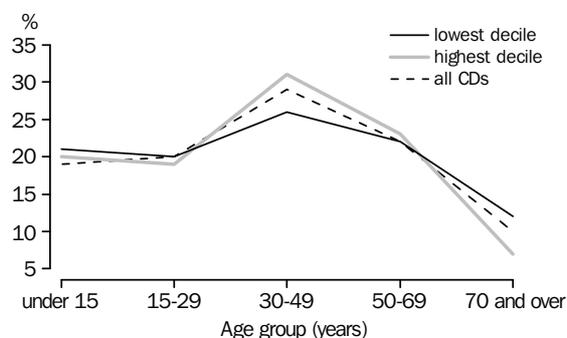
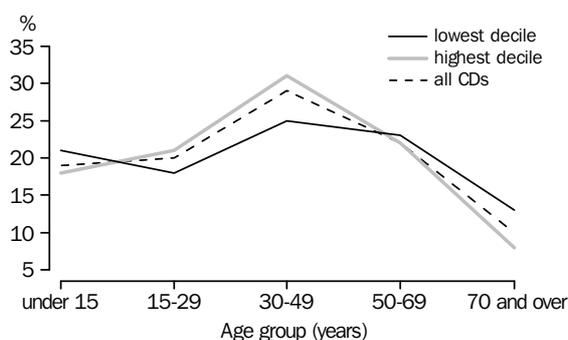### B.2 Index of Relative Advantage and Disadvantage, % people by age group

Figure B.3 below provides a comparison of the age structures of residents in the highest and lowest deciles of the Index of Economic Resources. Similar to the other indexes, the 30–49 year age group is overrepresented in the most advantaged decile and underrepresented in the most disadvantaged decile. However, the age distribution for this index contains some differences to those of the other indexes. For example, the highest decile has a below average proportion of 15–29 year olds, and an above average proportion of 50–69 year olds. The converse is true for the lowest decile. This can be explained by the fact that this index has a greater focus on wealth than the other indexes. Wealth is generally accumulated over the working life and tends to be greatest for people around retirement age.

B.3 Index of Economic Resources, % people by age group
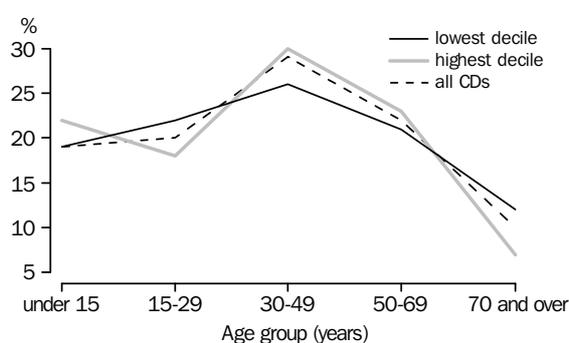
The relationship between age and the Index of Education and Occupation is shown below in figure B.4. One notable feature of the age distribution for this index is the high proportion of 15–29 year olds in the highest decile. CDs with many people in this age group are also likely to have a high proportion of people studying at university. People under 15 are overrepresented in the lowest decile of this index, and underrepresented in the highest decile. Further analysis revealed that CDs with many people with dependent offspring tended to have more people without school/post-school qualifications, or working in lower skilled occupations.

B.4 Index of Education and Occupation, % people by age group
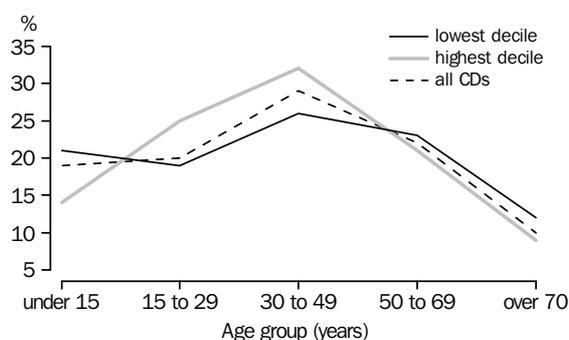
## B.2 The effect of age on selected SEIFA variables

Some of the socio-economic indicators used in SEIFA are influenced by age or life cycle effects. For example, the proportion of people in various age groups needing assistance with core activities is shown below in figure B.5. It is evident that the prevalence of disability for people aged 70 years and over is extremely high, relative to other age groups. In practice, a variable measuring the proportion of all people in the CD with a disability would primarily indicate the proportion of elderly people. In order to refine our disability measure to capture socio-economic factors beyond age, we limited the SEIFA variable to the population aged under 70.

B.5 % People needing assistance with core activities, by age group
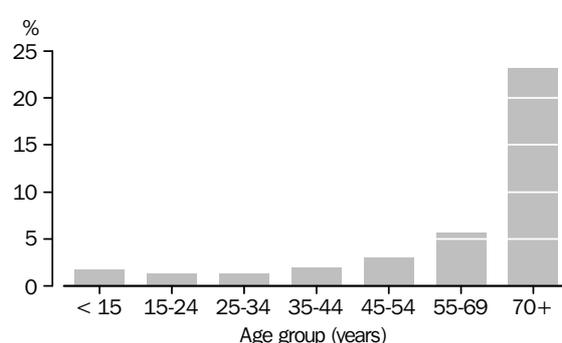
The equivalised income variables are also subject to life cycle effects, as shown in figure B.6 below. It is evident that people of working age are likely to have higher equivalised household incomes than older or younger people. People aged 70 years and over have the lowest equivalised incomes (although the scale of the difference from younger age groups is not as large as for the disability variable). We did not adjust the income variables for age. Income is a core aspect of socio-economic advantage and disadvantage for all age groups, therefore we did not want to lose the life cycle effects. For example, if a CD had a large proportion of older people on low incomes, we wanted that aspect of economic disadvantage to be reflected in SEIFA.

**B.6 % People with high and low income, by age group (a)**
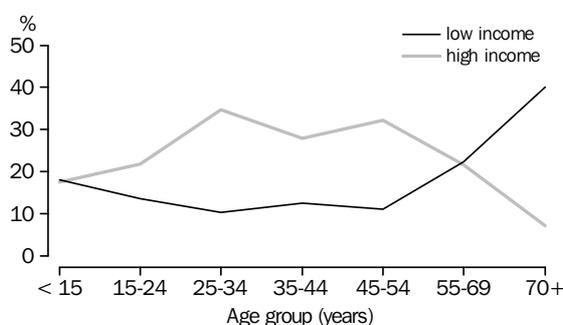
(a) The high income group is the highest equivalised household income quintile. The low income group is the 2nd and 3rd equivalised income deciles.

Level of education is another socio-economic characteristic measured in SEIFA that is related to age. Figures B.7 and B.8 show proportions of people by age group with no qualifications and no schooling, respectively. The proportion of people with no qualifications is high for the 15–24 year age group. Many of these people are still studying for their first post-school qualification. The proportion of people without qualifications is lowest amongst those aged 25–34 years, after which it increases for higher age groups. The proportion of people who never attended school increases with age across all age groups. This is due to changes in social norms regarding school attendance over the last 60–70 years.

B.7 % People with no qualifications, by age group
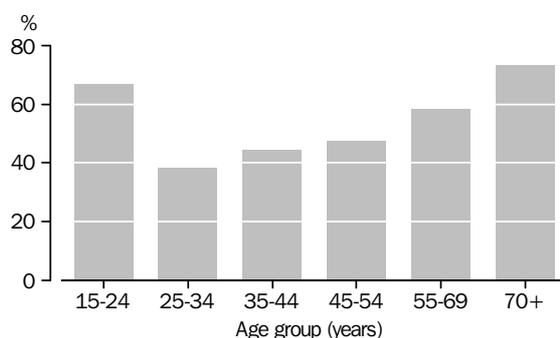
B.8 % People who never attended school, by age group
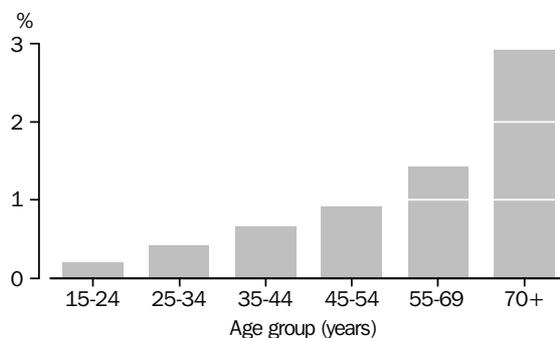
We did not adjust the education variables to account for age. The case for age-adjusting the education variables was not as straightforward as for the disability variable. There is no age after which lack of education sharply increases, as is the case for disability.

We investigated age-standardising the education variables, using a number of age ranges. There were a number of reasons why we decided that this technique was inappropriate for SEIFA:

- the small population of some CDs means only broad age ranges can be used, which limits the effectiveness of the standardisation;

- CDs with very few people in any particular age range would have to be excluded from SEIFA;

- we wanted to keep the SEIFA variables simple where possible, in order to make the indexes easier for users to interpret; and

- none of the previous editions of SEIFA have used standardised variables.

SEIFA is a general measure of relative socio-economic advantage and disadvantage that can be applied in many types of analysis. For some types of analysis, it may be useful to look at areas' age structures in combination with SEIFA.

C. VARIABLE SPECIFICATIONS

This appendix gives descriptions of each variable considered for inclusion in one of the 2006 indexes. The description of the variable proportion is followed by two bullet points; the first is a description of the numerator, the second is a description of the denominator. The square brackets contain specifications for creating the numerator/ denominator from Census data items, according to the mnemonics used in the *Census Dictionary, 2006* (ABS cat. no. 2901.0). The variables are arranged by socio-economic dimension.

Income variables

INC_LOW   % PEOPLE WITH STATED ANNUAL HOUSEHOLD EQUIVALISED INCOME BETWEEN $13,000 AND $20,799 (approx. 2nd and 3rd deciles)

- number of people with stated annual household equivalised income between $13,000 and 20,799 [HIED = 05]
- number of people living in classifiable occupied private dwellings with stated household equivalised income [HIED = 01–12]

INC_HIGH   % PEOPLE WITH STATED ANNUAL HOUSEHOLD EQUIVALISED INCOME GREATER THAN $52,000 (approx. 9th and 10th deciles)

- number of people with stated annual household equivalised income greater than $52,000 [HIED = 09–12]
- number of people living in classifiable occupied private dwellings with stated household equivalised income [HIED = 01–12]

Education variables

ATSCHOOL   % PEOPLE AGED 15 YEARS AND OVER WHO ARE STILL ATTENDING SECONDARY SCHOOL

- number of people aged 15 years and over who are still attending secondary school [TYPP = 31, 32 33]
- number of people aged 15 years and over (excluding educational institution attendance not stated) [AGEP > 14 and TYPP ne &&, VV]

ATUNI   % PEOPLE AGED 15 YEARS AND OVER AT A UNIVERSITY OR OTHER TERTIARY INSTITUTION

- number of people aged 15 years and over at university or other tertiary institution [AGEP > 14 and TYPP = 50]
- number of people aged 15 years and over (excluding educational institution attendance not stated) [AGEP > 14 and TYPP ne &&, VV]

CERTIFICATE % PEOPLE AGED 15 YEARS AND OVER WITH A CERTIFICATE QUALIFICATION

- number of people aged 15 years and over with a certificate qualification [QALLP = 5]
- number of people aged 15 years and over (excluding qualifications not stated) [AGEP > 14 and QALLP = 1–5, @@@]

DEGREE   % PEOPLE AGED 15 YEARS AND OVER WITH A DEGREE OR HIGHER QUALIFICATION

- number of people aged 15 years and over with a bachelor degree or higher qualification [QALLP = 1–3]
- number of people aged 15 years and over (excluding qualifications not stated) [AGEP > 14 and QALLP = 1–5, @@@]

DIPLOMA   % PEOPLE AGED 15 YEARS AND OVER WITH A DIPLOMA OR ADVANCED DIPLOMA

- number of people aged 15 years and over with a diploma or advanced diploma [QALLP = 4]

- number of people aged 15 years and over (excluding qualifications not stated) [AGEP > 14 and QALLP = 1–5, @@@]

NOQUAL   % PEOPLE AGED 15 YEARS AND OVER WITH NO POST-SCHOOL QUALIFICATIONS

- number of people aged 15 years and over with no qualifications (excluding those still at secondary school) [AGEP > 14 and QALLP = @@@ and TYPP ne 31, 32, 33]

- number of people aged 15 years and over (excluding qualifications not stated) [AGEP > 14 and QALLP = 1–5, @@@]

NOSCHOOL   % PEOPLE AGED 15 YEARS AND OVER WHO DID NOT GO TO SCHOOL

- number of people aged 15 years and over who did not go to school [HSCP = 6]

- number of people aged 15 years and over (excluding highest level of schooling not stated) [HSCP = 1–6]

NOYEAR12   % PEOPLE AGED 15 YEARS AND OVER WHOSE HIGHEST LEVEL OF SCHOOLING COMPLETED IS YEAR 11 OR LOWER

- number of people aged 15 years and over whose highest level of schooling completed is Year 11 or lower [HSCP = 2–6]

- number of people aged 15 years and over (excluding highest level of schooling not stated) [HSCP = 1–6]

Employment variables

UNEMPLOYED   % PEOPLE (IN THE LABOUR FORCE) WHO ARE UNEMPLOYED

- number of people aged 15 years and over who are unemployed and looking for work [LFS06P = 4–5]

- number of people aged 15 years and over in the labour force [LFS06P = 1–5]

UNEMP_POP_RATIO   % PEOPLE AGED 15 YEARS AND OVER WHO ARE UNEMPLOYED

- number of people aged 15 years and over who are unemployed and looking for work [LFS06P = 4–5]

- number of people aged 15 years and over (excluding labour force status not stated) [LFS06P = 1–6]

Occupation variables

OCC_ADMIN_L   % EMPLOYED PEOPLE CLASSIFIED AS LOW-SKILL CLERICAL AND ADMINISTRATIVE WORKERS

- number of employed people classified as Low-Skill Clerical and Administrative Workers [OCC06P = 5 and Skill Level = 4, 5] [21]

- number of employed people with a stated occupation [OCC06P = 1–8]

OCC_DRIVERS   % EMPLOYED PEOPLE CLASSIFIED AS MACHINERY OPERATORS AND DRIVERS

- number of employed people classified as Machinery Operators and Drivers [[OCC06P = 7]

- number of employed people with a stated occupation [OCC06P = 1–8]

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21 The Skill Level for each occupation can be found in Table 5 of the ABS data cube:
    ANZSCO, First Edition Structure (ABS cat. no. 1220.0).

OCC_LABOUR   % EMPLOYED PEOPLE CLASSIFIED AS LABOURERS

- number of employed people classified as Labourers [OCC06P = 8]
- number of employed people with a stated occupation [OCC06P = 1–8]

OCC_MANAGER   % EMPLOYED PEOPLE CLASSIFIED AS MANAGERS

- number of employed people classified as Managers [OCC06P = 1]
- number of employed people with a stated occupation [OCC06P = 1–8]

OCC_PROF   % EMPLOYED PEOPLE CLASSIFIED AS PROFESSIONALS

- number of employed people classified as Professionals [OCC06P = 2]
- number of employed people with a stated occupation [OCC06P = 1–8]

OCC_SALES_L   % EMPLOYED PEOPLE CLASSIFIED AS LOW-SKILL SALES WORKERS

- number of employed people classified as Low-Skill Sales Workers [OCC06P = 6 and Skill Level = 5]
- number of employed people with a stated occupation [OCC06P = 1–8]

OCC_SERVICE_L   % EMPLOYED PEOPLE CLASSIFIED AS LOW-SKILL COMMUNITY AND PERSONAL SERVICE WORKERS

- number of employed people classified as Low-Skill Community and Personal Service Workers [OCC06P = 4 and Skill Level = 4–5]
- number of employed people with a stated occupation [OCC06P = 1–8]

OCC_SKILL1   % EMPLOYED PEOPLE WHO WORK IN A SKILL LEVEL 1 OCCUPATION

- number of employed people who work in a Skill Level 1 occupation [Skill Level = 1]
- number of employed people with a stated occupation [OCC06P = 1–8]

OCC_SKILL2   % EMPLOYED PEOPLE WHO WORK IN A SKILL LEVEL 2 OCCUPATION

- number of employed people who work in a Skill Level 2 occupation [Skill Level = 2]
- number of employed people with a stated occupation [OCC06P = 1–8]

OCC_SKILL4   % EMPLOYED PEOPLE WHO WORK IN A SKILL LEVEL 4 OCCUPATION

- number of employed people who work in a Skill Level 4 occupation [Skill Level = 4]
- number of employed people with a stated occupation [OCC06P = 1–8]

OCC_SKILL5   % EMPLOYED PEOPLE WHO WORK IN A SKILL LEVEL 5 OCCUPATION

- number of employed people who work in a Skill Level 5 occupation [Skill Level = 5]
- number of employed people with a stated occupation [OCC06P = 1–8]

Housing variables

FEWBED   % CLASSIFIABLE OCCUPIED PRIVATE DWELLINGS WITH ONE OR NO BEDROOMS

- number of classifiable occupied private dwellings with one or no bedrooms [BEDD = 0,1 and HHCD = 11–32] [22]
- number of classifiable occupied private dwellings with a stated number of bedrooms [BEDD = 1–5 and HHCD = 11–32]

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22   Household composition was 'not classifiable' if the household: contained only visitors or persons aged under 15 years on Census night; or was determined to be occupied on Census Night but the collector could not make contact; or could not be classified because there was insufficient information on the Census form.

GROUP   % HOUSEHOLDS THAT ARE GROUP HOUSEHOLDS

- number of classifiable occupied private dwellings that are occupied by group households [HHCD = 32 and HHCD = 11–32]
- number of classifiable occupied private dwellings [HHCD = 11–32]

HIGHBED   % CLASSIFIABLE OCCUPIED PRIVATE DWELLINGS WITH FOUR OR MORE BEDROOMS

- number of classifiable occupied private dwellings with four or more bedrooms [BEDD = 4–5 and HHCD = 11–32]
- number of classifiable occupied private dwellings with a stated number of bedrooms [BEDD = 1–5 and HHCD = 11–32]

HIGHMORTGAGE   % HOUSEHOLDS PAYING A MORTGAGE WHO PAY MORE THAN $2,120 PER MONTH

- number of mortgaged classifiable occupied private dwellings with monthly mortgage repayments greater than $2,120 [HLRD = 2121–9999 and HHCD = 11–32]
- number of mortgaged classifiable occupied private dwellings with stated mortgage repayments [HLRD = 0–9999 and HHCD = 11–32]

HIGHRENT   % HOUSEHOLDS PAYING RENT WHO PAY MORE THAN $290 PER WEEK

- number of rented classifiable occupied private dwellings with rent payments greater than $290 per week [RNTD = 291–9999 and HHCD = 11–32]
- number of rented classifiable occupied private dwellings with stated rent payments [RNTD = 0–9999 and HHCD = 11–32]

IMPDWEL   % OCCUPIED CLASSIFIABLE PRIVATE DWELLINGS THAT ARE IMPROVISED DWELLINGS

- number of occupied private dwellings that are improvised dwellings [STRD = 93 and HHCD = 11–32]
- number of classifiable occupied private dwellings with stated dwelling structure [STRD ne &&, @@ and HHCD = 11–32]

LOWRENT   % HOUSEHOLDS PAYING RENT WHO PAY LESS THAN $120 PER WEEK (EXCLUDING $0 PER WEEK)

- number of rented classifiable occupied private dwellings with rent payments less than $120 per week (excluding rent-free and renting from employer) [RNTD = 1–119 and HHCD = 11–32 and LLDD ne 51, 52]
- number of rented classifiable occupied private dwellings with stated rent payments [RNTD = 0–9999 and HHCD = 11–32]

OVERCROWD   % CLASSIFIABLE OCCUPIED PRIVATE DWELLINGS REQUIRING ONE OR MORE EXTRA BEDROOMS (BASED ON CANADIAN NATIONAL OCCUPANCY STANDARD)

- number of classifiable occupied private dwellings needing one or more extra bedrooms (based on Canadian National Occupancy Standard [23]) [Housing utilisation [24] = 'One or more extra bedrooms needed' and HHCD = 11–32]
- number of classifiable occupied private dwellings where Canadian National Occupancy Standard can be determined [Housing utilisation ne 'Not applicable', 'Unable to be determined', 'Not stated' and HHCD = 11–32]]

OWNING   % HOUSEHOLDS OWNING THE DWELLING THEY OCCUPY (WITHOUT A MORTGAGE)

- number of households owning the dwelling they occupy without a mortgage (includes caravans in parks) [TEND = 1 and HHCD = 11–32]
- number of classifiable occupied private dwellings (including those with occupancy not stated) [TEND = 1–7, & and HHCD = 11–32]

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23 The Canadian National Occupancy Standard determines housing appropriateness, using the number of bedrooms and the number, age, sex and relationships of household members. For more information refer to *Housing Occupancy and Costs, Australia, 2005–06* (ABS cat. no. 4130.0.55.001).

24 The 'Housing utilisation' variable was derived from Census data items, according to the Canadian National Occupancy Standard.

MORTGAGE % HOUSEHOLDS OWNING THE DWELLING THEY OCCUPY (WITH A MORTGAGE)

- number of mortgaged classifiable occupied private dwellings [TEND = 2, 3, 6 and HHCD = 11–32]
- number of classifiable occupied private dwellings (including those with occupancy not stated) [TEND = 1–7, & and HHCD = 11–32]

RENT_SOCIAL % HOUSEHOLDS RENTING DWELLING FROM A GOVERNMENT OR COMMUNITY ORGANISATION

- number of occupied private dwellings rented from a government authority or housing co-operative/community/church group [LLDD = 20, 60 and HHCD = 11–32]
- number of classifiable occupied private dwellings (including those with occupancy not stated) [TEND = 1–7, & and HHCD = 11–32]

SPAREBED % CLASSIFIABLE OCCUPIED PRIVATE DWELLINGS WITH ONE OR MORE SPARE BEDROOMS (BASED ON CANADIAN NATIONAL OCCUPANCY STANDARD)

- number of classifiable occupied private dwellings with one or more spare bedrooms (based on Canadian National Occupancy Standard) [Housing utilisation = 'One bedroom spare', 'Two or more bedrooms spare' and HHCD = 11–32]
- number of classifiable occupied private dwellings where Canadian National Occupancy Standard can be determined [Housing utilisation ne 'Not applicable', 'Unable to be determined', 'Not stated' and HHCD = 11–32]]

Other indicators of advantage or disadvantage

Cars

HIGHCAR % CLASSIFIABLE OCCUPIED PRIVATE DWELLINGS WITH 3 OR MORE CARS

- number of classifiable occupied private dwellings which had 3 or more registered motor vehicles at or near the dwelling [VEHD >= 3 and HHCD = 11–32]
- number of classifiable occupied private dwellings (excluding number of vehicles not stated) [VEHD ne &&, @@ and HHCD = 11–32]

NOCAR % CLASSIFIABLE OCCUPIED PRIVATE DWELLINGS WITH NO CARS

- number of classifiable occupied private dwellings with did not have a registered motor vehicle at or near the dwelling [VEHD = 0 and HHCD = 11–32]
- number of classifiable occupied private dwellings (excluding number of vehicles not stated) [VEHD ne &&, @@ and HHCD = 11–32]

Internet

BROADBAND % CLASSIFIABLE OCCUPIED PRIVATE DWELLINGS WITH BROADBAND INTERNET CONNECTION

- number of classifiable occupied private dwellings with a broadband Internet connection [NEDD = 2 and HHCD = 11–32]
- number of classifiable occupied private dwellings (excluding Internet connection not stated) [NEDD ne &, @ and HHCD = 11–32]

NONET % CLASSIFIABLE OCCUPIED PRIVATE DWELLINGS WITH NO INTERNET CONNECTION

- number of classifiable occupied private dwellings with no Internet connection [NEDD = 1 and HHCD = 11–32]
- number of classifiable occupied private dwellings (excluding Internet connection not stated) [NEDD ne &, @ and HHCD = 11–32]

Other

DISABILITYU70	% PEOPLE AGED UNDER 70 WHO NEED ASSISTANCE WITH CORE ACTIVITIES DUE TO A LONG-TERM HEALTH CONDITION, DISABILITY OR OLD AGE

DISABILITYU70   % PEOPLE AGED UNDER 70 WHO NEED ASSISTANCE WITH CORE ACTIVITIES DUE TO A LONG-TERM HEALTH CONDITION, DISABILITY OR OLD AGE

- number of people aged under 70 years needing help or assistance in one or more of the three core activity areas of self-care, mobility and communication, because of a disability, long term health condition (lasting six months or more) or old age [AGEP < 70 and ASSNP = 1]
- number of people aged under 70 years (excluding need for assistance not stated) [AGEP < 70 and ASSNP = 1–2]

ENGLISHPOOR   % PEOPLE WHO DO NOT SPEAK ENGLISH WELL

- number of people aged five years and over who speak English either not well or not at all [AGEP > 4 and ENGP01= 4, 5]
- number of people aged 5 years and over (excluding those who did not state their English proficiency or main language) [AGEP > 4 and ENGP01 = 1–5]

INDIGENOUS   % PEOPLE WHO IDENTIFIED THEMSELVES AS BEING OF ABORIGINAL AND/OR TORRES STRAIT ISLANDER ORIGIN

- number of people who identified themselves as being of Aboriginal and/or Torres Strait Islander origin [INGP = 2–4]
- number of people (excluding Indigenous status not stated) [INGP = 1–4]

LONE   % HOUSEHOLDS THAT ARE LONE PERSON HOUSEHOLDS

- number of classifiable occupied private dwellings that are occupied by lone person households [HHCD = 31]
- number of classifiable occupied private dwellings [HHCD = 11–32]

ONEPARENT   % FAMILIES THAT ARE ONE PARENT FAMILIES WITH DEPENDENT OFFSPRING ONLY

- number of families that are one parent families with dependent offspring only [FMCF = 3112, 3122, 3212]
- number of families [FMCF ne @@@@]

DIVORCED   % PEOPLE AGED 15 AND OVER WHO ARE SEPARATED OR DIVORCED

- number of people aged 15 years and over who are separated or divorced [MSTP = 3, 4]
- number of people aged 15 years and over [MSTP = 1–5]

UNINCORP   % CLASSIFIABLE OCCUPIED PRIVATE DWELLINGS WITH AT LEAST ONE PERSON WHO IS THE OWNER OF AN UNINCORPORATED ENTERPRISE

- of classifiable occupied private dwellings where at least one usual resident is the owner of an unincorporated enterprise [EMTP = 3 and UAICP = 1 and HHCD = 11–32, for at least one household member]
- number of classifiable occupied private dwellings [HHCD = 11–32]

D. VARIABLE WEIGHTS IN 2001 AND 2006

D.1 Index of Relative Disadvantage, variable weights in 2001 and 2006

Dimension	Variable description	2001 weight	2006 weight
INCOME	% People with stated annual household equivalised income between $13,000 and $20,799 (approx. 2nd and 3rd deciles)	–	–0.30
	% Families with income less than $15,600	–0.23	–
	% Families with offspring having parental income less than $15,600	–0.29	–
EDUCATION	% People aged 15 years and over with no post-school qualifications	–0.31	–0.30
	% People aged 15 years and over who did not go to school	–0.19	–0.17
	% People aged 15 years and over who left school at Year 10 or lower	–0.25	–
EMPLOYMENT	% People (in the labour force) unemployed	–	–0.27
	% Males in labour force unemployed	–0.27	–
	% Females in labour force unemployed	–0.27	–
OCCUPATION	% Employed people classified as Labourers	–	–0.30
	% Employed people classified as Machinery Operators and Drivers	–	–0.20
	% Employed people classified as Low Skill Community and Personal Service Workers	–	–0.17
	% Employed males as classified as 'Labourers and Related Workers'	–0.27	–
	% Employed females classified as 'Labourers and Related Workers'	–0.27	–
	% Employed males classified as 'Intermediate Production and Transport Workers'	0.24	–
	% Employed females classified as 'Intermediate Production and Transport Workers'	–0.19	–
	% Employed females classified as 'Elementary Clerical, Sales and Service Workers'	0.13	–
	% Employed males classified as 'Tradespersons'	–0.11	–
HOUSING	% Households renting from a Government or Community organisation	–	–0.27
	% Occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard)	–	–0.20
	% Households paying rent who pay less than $120 per week (excluding $0 per week)	–	–0.26
	% Households renting from a Government organisation	–0.22	–
	% Occupied private dwellings with two or more families	–0.13	–
OTHER	% Families that are one parent families with dependent offspring only	–0.25	–0.26
	% Occupied private dwellings with no car	–0.19	–0.22
	% People aged 15 years and over who are separated or divorced	–0.19	–0.20
	% People who identified themselves as being of Aboriginal and/or Torres Strait Islander origin	–0.18	–0.20
	% People who do not speak English well	–0.15	–0.13
	% Occupied private dwellings with no Internet connection	–	–0.33
	% People aged under 70 who need assistance with core activities due to a long-term health condition, disability or old age	–	–0.24

D.2 Index of Relative Advantage and Disadvantage, variable weights in 2001 and 2006

Dimension	Variable description	*2001 weight*	*2006 weight*
INCOME	% People with stated annual household equivalised income between $13,000 and $20,799 (approx. 2nd and 3rd deciles)	–	–0.28
	% People with stated annual household equivalised income greater than $52,000 (approx. 9th and 10th deciles)	–	0.29
	% Couple families with no children with annual income less than $20,800	–0.20	–
	% Couple families with dependent child(ren) only with annual income less than $36,400	–0.20	–
	% Single person household with income less than $15,600	–0.18	–
	% Couple families with dependents and non-dependents or with non-dependents only with annual income less than $52,000	–0.15	–
	% Single parent families with dependents and non-dependents or with non-dependents with annual income less than $26,000	–0.10	–
	% Single parent families with dependents and non-dependents or with non-dependents with annual income greater than $62,399	0.13	–
	% Single parent families with dependent child(ren) only with annual income greater than $36,399	0.17	–
	% Couple families with dependents and non-dependents or with non-dependents only with annual income greater than $103,999	0.18	–
	% Single person households with income greater than $36,399	0.20	–
	% Couple families with no children with annual income greater than $77,999	0.23	–
	% Couple families with dependent child(ren) only with annual income greater than $77,999	0.24	–
EDUCATION	% People aged 15 years and over with no post-school qualifications	–0.25	–0.29
	% People aged 15 years and over at university or other tertiary institution	0.15	0.14
	% People aged 15 years and over with an advanced diploma or diploma qualification	0.21	0.24
	% People aged 15 years and over whose highest level of schooling completed is Year 11 or lower	–0.24	–
	% People aged 15 years and over with a degree or higher qualification	0.24	–
EMPLOYMENT	% People (in the labour force) unemployed	–	–0.20
	% Males in labour force unemployed	–0.16	–
	% Females in labour force unemployed	–0.16	–
OCCUPATION	% Employed people classified as Labourers	–	–0.26
	% Employed people classified as Machinery Operators and Drivers	–	–0.20
	% Employed people classified as Low Skill Community and Personal Service Workers	–	–0.13
	% Employed people classified as Professionals	–	0.24
	% Employed males classified as 'Labourers and Related Workers'	–0.19	–
	% Employed females classified as 'Labourers and Related Workers'	–0.19	–
	% Employed males classified as 'Intermediate Production and Transport Workers'	–0.19	–

D.2 Index of Relative Advantage and Disadvantage, variable weights in 2001 and 2006 (cont.)

Dimension	Variable description	2001 weight	2006 weight
OCCUPATION (cont.)	% Employed females classified as 'Intermediate Production and Transport Workers'	–0.12	–
	% Employed males classified as 'Tradespersons'	–0.13	–
	% Employed females classified as 'Elementary Clerical, Sales and Service Workers'	–0.10	–
	% Employed females classified as 'Advanced Clerical and Service Workers'	0.10	–
	% Employed males classified as 'Associate Professionals'	0.14	–
	% Employed females classified as 'Professionals'	0.21	–
	% Employed males classified as 'Professionals'	0.23	–
HOUSING	% Occupied private dwellings with four or more bedrooms	0.08	0.13
	% Households paying rent who pay less than $120 per week (excluding $0 per week)	–	–0.21
	% Households renting from a Government or Community organisation	–	–0.17
	% Occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard)	–	–0.11
	% Households paying mortgage who pay more than $2,120 per month	–	0.23
	% Households paying rent who pay more than $290 per week	–	0.24
OTHER	% Families that are one parent families with dependent offspring only	–0.13	–0.19
	% Occupied private dwellings with no Internet connection	–	–0.29
	% People aged under 70 who need assistance with core activities due to a long-term health condition, disability or old age	–	–0.20
	% Occupied private dwellings with no car	–	–0.11
	% Occupied private dwellings with a broadband Internet connection	–	0.26
	% Persons using Internet at home	0.19	–

D.3 Index of Economic Resources, variable weights in 2001 and 2006

Dimension	Variable description	2001 weight	2006 weight
INCOME	% People with stated annual household equivalised income between $13,000 and $20,799 (approx. 2nd and 3rd deciles)	–	–0.31
	% People with stated annual household equivalised income greater than $52,000 (approx. 9th and 10th deciles)	–	0.27
	% Couple families with dependent child(ren) only with annual income less than $36,400	–0.28	–
	% Couple families with no children with annual income less than $20,800	–0.28	–
	% Single person household with income less than $15,600	–0.27	–
	% Couple families with dependents and non-dependents or with non-dependents only with annual income less than $52,000	–0.23	–
	% Single parent families with dependents and non-dependents or with non-dependents with annual income less than $26,000	–0.16	–
	% Single parent families with dependents and non-dependents or with non-dependents with annual income greater than $62,399	0.20	–
	% Single parent families with dependent child(ren) only with annual income greater than $36,399	0.24	–
	% Couple families with dependents and non-dependents or with non-dependents only with annual income greater than $103,999	0.26	–
	% Single person households with income greater than $36,399	0.30	–
	% Couple families with no children with annual income greater than $77,999	0.32	–
	% Couple families with dependent child(ren) only with annual income greater than $77,999	0.33	–
EMPLOYMENT	% People aged 15 years and over who are unemployed	–	–0.27
HOUSING	% Occupied private dwellings with four or more bedrooms	0.13	0.29
	% Households paying rent who pay an amount in the bottom quintile of all renters (excluding $0 per week) (<$88 / wk in 2001, <$120 / wk in 2006)	–0.19	–0.28
	% Households paying mortgage who pay an amount in the top quintile of all mortgagees (>$1,360 / mth in 2001, >$2,120 / mth in 2006)	0.29	0.23
	% Households paying rent who pay an amount in the top quintile of all renters (>$225 / wk in 2001, >$290 / wk in 2006)	0.30	0.24
	% Households renting from a Government or Community organisation	–	–0.29
	% Occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard)	–	–0.20
	% Households owning the dwelling they occupy (without a mortgage)	–	0.14
	% Households owning the dwelling they occupy (with a mortgage)	–	0.24
OTHER	% Families that are one parent families with dependent offspring only	–	–0.30
	% Occupied private dwellings with no car	–	–0.30
	% Households that are lone person households	–	–0.25
	% Occupied private dwellings with at least one person who is an owner of an unincorporated enterprise	–	0.20

D.4 Index of Education and Occupation, variable weights in 2001 and 2006

Dimension	Variable description	2001 weight	2006 weight
EDUCATION	% People aged 15 years and over whose highest level of schooling completed is Year 11 or lower	–0.32	–0.41
	% People aged 15 years and over with no post-school qualifications	–0.32	–0.40
	% People aged 15 years and over at university or other tertiary institution	0.21	0.26
	% People aged 15 years and over with an advanced diploma or diploma qualification	0.28	0.35
	% People aged 15 years and over with a certificate qualification	–	–0.23
	% People aged 15 years and over with a degree or higher qualification	0.33	–
OCCUPATION	% Employed people who work in a Skill Level 5 occupation	–	–0.36
	% Employed people who work in a Skill Level 4 occupation	–	–0.31
	% Employed people who work in a Skill Level 1 occupation	–	0.39
	% Employed males classified as 'Intermediate Production and Transport Workers'	–0.26	–
	% Employed females classified as 'Labourers and Related Workers'	–0.25	–
	% Employed males classified as 'Labourers and Related Workers'	–0.24	–
	% Employed males classified as 'Tradespersons'	–0.19	–
	% Employed females classified as 'Intermediate Production and Transport Workers'	–0.18	–
	% Employed females classified as 'Elementary Clerical, Sales and Service Workers'	–0.14	–
	% Employed males classified as 'Advanced Clerical and Service Workers'	0.12	–
	% Employed males classified as 'Associate Professionals'	0.18	–
	% Employed females classified as 'Professionals'	0.29	–
	% Employed males classified as 'Professionals'	0.31	–
EMPLOYMENT	% People (in the labour force) who are unemployed	–	–0.23
	% Females (in the labour force) who are unemployed	–0.18	–
	% Males (in the labour force) who are unemployed	–0.17	–

E. VARIABLE VALUES FOR HIGHEST AND LOWEST RANKED CDS

E.1 Index of Relative Disadvantage, variable proportions for bottom five CDs

Variable	CD 1	CD 2	CD 3	CD 4	CD 5	Mean for all CDs
NONET	0.97	0.83	1.00	1.00	1.00	0.37
OCC_LABOUR	0.74	0.42	0.77	0.60	1.00	0.12
NOQUAL	0.96	0.86	0.92	0.95	0.87	0.50
INC_LOW	0.66	0.39	0.84	0.00	0.60	0.18
RENT_SOCIAL	0.94	0.67	0.90	1.00	0.71	0.05
UNEMPLOYED	0.57	0.00	0.30	0.06	0.07	0.06
ONEPARENT	0.18	0.08	0.06	0.38	0.50	0.09
LOWRENT	1.00	0.88	1.00	0.86	1.00	0.15
DISABILITYU70	0.01	0.38	0.00	0.00	0.02	0.03
NOCAR	0.94	0.75	0.89	0.71	1.00	0.10
INDIGENOUS	0.99	0.89	1.00	0.98	1.00	0.03
OVERCROWD	0.63	0.17	1.00	0.86	0.67	0.03
DIVORCED	0.04	0.04	0.00	0.10	0.03	0.12
OCC_DRIVERS	0.00	0.00	0.00	0.00	0.00	0.07
NOSCHOOL	0.07	0.50	0.00	0.28	0.09	0.01
OCC_SERVICE_L	0.09	0.05	0.08	0.20	0.00	0.07
ENGLISHPOOR	0.00	0.52	0.27	0.28	0.01	0.02

E.2 Index of Relative Disadvantage, variable proportions for top five CDs

Variable	CD 1	CD 2	CD 3	CD 4	CD 5	Mean for all CDs
NONET	0.00	0.06	0.06	0.07	0.13	0.37
OCC_LABOUR	0.00	0.00	0.02	0.01	0.03	0.12
NOQUAL	0.53	0.07	0.25	0.23	0.13	0.50
INC_LOW	0.00	0.00	0.02	0.03	0.00	0.18
RENT_SOCIAL	0.00	0.00	0.00	0.00	0.00	0.05
UNEMPLOYED	0.00	0.04	0.02	0.03	0.00	0.06
ONEPARENT	0.00	0.04	0.02	0.02	0.00	0.09
LOWRENT	0.00	0.00	0.00	0.00	0.00	0.15
DISABILITYU70	0.00	0.00	0.01	0.01	0.00	0.03
NOCAR	0.00	0.01	0.02	0.03	0.03	0.10
INDIGENOUS	0.00	0.00	0.00	0.00	0.00	0.03
OVERCROWD	0.00	0.01	0.00	0.00	0.00	0.03
DIVORCED	0.00	0.03	0.02	0.02	0.17	0.12
OCC_DRIVERS	0.00	0.00	0.01	0.01	0.00	0.07
NOSCHOOL	0.00	0.00	0.00	0.00	0.00	0.01
OCC_SERVICE_L	0.00	0.06	0.03	0.02	0.00	0.07
ENGLISHPOOR	0.00	0.01	0.01	0.00	0.00	0.02

E.3 Index of Economic Resources, variable proportions for bottom five CDs

Variable	CD 1	CD 2	CD 3	CD 4	CD 5	Mean for all CDs
INC_LOW	0.84	0.66	0.60	0.61	0.93	0.18
ONEPARENT	0.06	0.18	0.50	0.36	0.38	0.09
NOCAR	0.89	0.94	1.00	0.76	0.67	0.10
RENT_SOCIAL	0.90	0.94	0.71	0.80	1.00	0.05
LOWRENT	1.00	1.00	1.00	0.65	1.00	0.15
UNEMP_POP_RATIO	0.22	0.29	0.03	0.16	0.00	0.03
LONE	0.00	0.06	0.07	0.13	0.00	0.25
OVERCROWD	1.00	0.63	0.67	0.70	0.67	0.03
OWNING	0.00	0.00	0.00	0.00	0.00	0.35
UNINCORP	0.00	0.00	0.00	0.03	0.00	0.11
HIGHMORTGAGE	0.00	0.00	0.00	0.00	0.00	0.19
MORTGAGE	0.00	0.00	0.00	0.00	0.00	0.33
HIGHRENT	0.00	0.00	0.00	0.01	0.00	0.18
INC_HIGH	0.00	0.00	0.00	0.02	0.00	0.23
HIGHBED	0.00	0.00	0.00	0.17	0.00	0.28

E.4 Index of Economic Resources, variable proportions for top five CDs

Variable	CD 1	CD 2	CD 3	CD 4	CD 5	Mean for all CDs
INC_LOW	0.00	0.03	0.01	0.02	0.01	0.18
ONEPARENT	0.00	0.01	0.02	0.02	0.02	0.09
NOCAR	0.00	0.01	0.01	0.00	0.03	0.10
RENT_SOCIAL	0.00	0.00	0.00	0.00	0.00	0.05
LOWRENT	0.00	0.00	0.00	0.00	0.00	0.15
UNEMP_POP_RATIO	0.00	0.02	0.01	0.01	0.00	0.03
LONE	0.03	0.04	0.09	0.03	0.10	0.25
OVERCROWD	0.00	0.00	0.00	0.00	0.00	0.03
OWNING	0.41	0.04	0.53	0.27	0.56	0.35
UNINCORP	0.14	0.08	0.16	0.15	0.18	0.11
HIGHMORTGAGE	0.77	0.77	0.62	0.55	0.79	0.19
MORTGAGE	0.50	0.83	0.34	0.69	0.30	0.33
HIGHRENT	0.67	1.00	1.00	0.89	0.85	0.18
INC_HIGH	0.84	0.54	0.79	0.67	0.80	0.23
HIGHBED	0.83	0.99	0.83	0.87	0.71	0.28

E.5 Index of Education and Occupation, variable proportions for bottom five CDs

Variable	CD 1	CD 2	CD 3	CD 4	CD 5	Mean for all CDs
NOYEAR12	1.00	0.99	1.00	0.98	0.98	0.54
NOQUAL	0.93	0.96	0.83	0.88	0.96	0.50
OCC_SKILL5	0.80	0.65	0.75	0.78	0.41	0.19
OCC_SKILL4	0.00	0.22	0.00	0.19	0.36	0.25
UNEMPLOYED	0.64	0.57	0.53	0.23	0.39	0.06
CERTIFICATE	0.07	0.02	0.07	0.11	0.04	0.19
ATUNI	0.00	0.02	0.00	0.00	0.00	0.05
DIPLOMA	0.00	0.01	0.00	0.00	0.00	0.08
OCC_SKILL1	0.10	0.00	0.00	0.04	0.18	0.29

E.6 Index of Education and Occupation, variable proportions for top five CDs

Variable	CD 1	CD 2	CD 3	CD 4	CD 5	Mean for all CDs
NOYEAR12	0.58	0.18	0.06	0.12	0.19	0.54
NOQUAL	0.25	0.13	0.68	0.08	0.21	0.50
OCC_SKILL5	0.00	0.00	0.02	0.05	0.08	0.19
OCC_SKILL4	0.10	0.05	0.04	0.06	0.14	0.25
UNEMPLOYED	0.00	0.00	0.00	0.06	0.05	0.06
CERTIFICATE	0.17	0.04	0.09	0.07	0.06	0.19
ATUNI	0.00	0.07	0.55	0.21	0.21	0.05
DIPLOMA	0.50	0.11	0.04	0.09	0.18	0.08
OCC_SKILL1	0.50	0.89	0.88	0.80	0.64	0.29

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