**CONSULTANT'S REPORT**

**COMMONWEALTH GRANTS COMMISSION**

**REPORT ON EXPERIMENTAL INDIGENOUS SOCIOECONOMIC
DISADVANTAGE INDEXES**

**AUSTRALIAN BUREAU OF STATISTICS
2000**

# REPORT ON

# EXPERIMENTAL INDIGENOUS SOCIOECONOMIC

# DISADVANTAGE INDEXES

## EXECUTIVE SUMMARY

## AUSTRALIAN BUREAU OF STATISTICS

## NOVEMBER 2000

# ACKNOWLEDGEMENTS

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# EXECUTIVE SUMMARY

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*Introduction*

1. This paper presents the outcomes of a study being undertaken for the Commonwealth Grants Commission, which is currently conducting an Indigenous Funding Inquiry that is tasked to develop methods for measuring the relative needs of the Indigenous people, across geographic regions, for certain key 'functional areas' of expenditure (namely, housing and infrastructure, employment and training, health, and education).

2. This report presents the indexes that were constructed by ABS to assist the Inquiry. These indexes may be used to compare Indigenous socioeconomic disadvantage in different regions. Specifically, the indexes may provide information about the rankings of Indigenous areas' disadvantage, but not about absolute or relative levels of disadvantage. They are meant as scene-setting material for the detailed needs assessments being undertaken by the Commission. The indexes encapsulate socioeconomic positions based on such criteria as income, educational level, occupation, and condition of dwelling. It is intended to reflect the deprivation of (or inability to command or access) economic resources and infrastructure which support participation in social and economic life.

3. The aims of this summary are as follows:

  (i) highlight the data sources used in the study;

  (ii) enumerate the different indexes constructed;

  (iii) explain how these indexes were constructed;

  (iv) show the patterns of results;

  (v) discuss how best to use the indexes; and

  (vi) provide an outline of the main report [that follows this summary].

*Data sources*

4. Disadvantage indicators were derived from the 1996 Census of Population and Housing, the National Aboriginal and Torres Strait Islander Survey (NATSIS), and national perinatal data collected by the National Perinatal Statistics Unit of the Australian Institute of Health and Welfare. These indicators represent levels of education, income, housing, mobility, family structure, employment in low-paying occupations, health and access to community services.

5. The Accessibility Remoteness Index of Australia (ARIA) has also been applied to detect possible differences in disadvantage between accessible, moderately accessible and

remote areas. Disadvantage indicators from the 1999 Community Housing and Infrastructure Needs Survey (CHINS) were investigated but were ruled out for melding with the Census and NATSIS indicators. Although CHINS is a Census of all discrete Indigenous communities in Australia, not all Indigenous Areas or ATSIC regions contained discrete communities. In CHINS, the 1,291 discrete communities were situated in 273 different Indigenous Areas, out of a possible 692 Indigenous Areas. In terms of the Indigenous population covered by CHINS, only 15 out of 36 ATSIC regions had 70 percent or more of their Indigenous population located in these communities.

6.       Thus it is difficult to infer the characteristics of the population of Indigenous Areas or ATSIC Regions based on the characteristics of the population in discrete communities. The study however undertook sensitivity analyses to investigate how the inclusion of CHINS data affects the ranking of the 15 regions for which 70 percent or more of the population live in discrete communities.

7.       The quality of the data in the sources mentioned above were also examined and formed an important part of the report.

### *Disadvantage Indexes*

8.       Nine experimental indexes have been constructed:

  (i) a general index based on data from the 1996 Census;.

 (ii) a decomposition of the index in (i), by accessible, moderately accessible and remote areas;

(iii) a general index based on melded Census, 1994 NATSIS and national perinatal data.

### *Indexes specific to economic and habitat aspects of disadvantage —*

(iv) an economic index —  a disaggregated index that captures disadvantage related to employment, income, and education;

 (v) a habitat index— a disaggregated index that captures disadvantage related to housing, infrastructure and health.

### *Indexes specific to functional areas —*

 (vi) an education index —  the index in (iv) minus the employment and income variables.

(vii) an employment and income index — the index in (iv) minus the education variables.

(viii) a housing and infrastructure index; and

(ix) a health index based on NATSIS and perinatal statistics. (An alternative health index, based on hospital utilisation, was also derived using data from the 1997-98 National Hospital Morbidity Database).

9.     A separate group of variables was created for each of the nine indexes. Principal Components Analysis (PCA) was used to analyse each group. A set of index scores and rankings were then derived reflecting relative disadvantage by geographic area.


*Approach*

10.     To construct the disadvantage indexes the following questions had to be addressed :

  (i) What variables should be included in any single indicator or summary index that represents Indigenous disadvantage?

 (ii) Which data sources can provide variables for the populations and areas of interest?

(iii) What is the quality of the data? What aspects of data quality have greatest effect on the choice and application of an analytical technique?

(iv) What techniques are available to summarise these variables into one index? What are the advantages of the chosen technique? What are its limitations and implications for interpretation of the results?

 (v) How robust are the results with respect to the variables and the technical options chosen?

(vi) How valid and plausible are the results? Are they consistent with other sources of information about the areas?

The ABS's approach to index construction is summarised in the following diagram:

**Figure 1**        APPROACH TO INDEX CONSTRUCTION

```
        Identify  ──►  Identify data
        variables       source
      ▲                              ╲
                                      ▼
   Define                        Identify
   disadvantage                  technique to
                                 create iindex
                                      │
                                      ▼
   Check      ◄──  Test for    ◄──  Construct
   validity of     robustness        the index
   results         of results
```
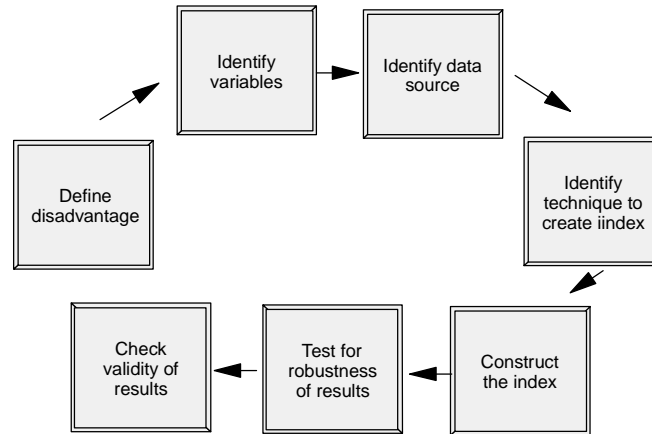
*Indicators of Indigenous disadvantage*

11.     The 1996 Census of Population and Housing is the most comprehensive data source on the characteristics of Indigenous Australians.  It has the geographic coverage required and its quality is generally reliable.  The amalgamation of Census, NATSIS and national perinatal data has allowed the incorporation of important dimensions of disadvantage such as health (to a limited extent) and access to community infrastructure.  The use of combined data sources, however, has restricted the analysis to the ATSIC Region level as the non-Census data do not support Indigenous Area reporting.

12.     The construction of a general single index (based on Census + NATSIS + National Perinatal Data) resulted in the following set of final variables:

| | |
|---|---|
| Levels of educational attainment | % of persons (15 years and over) without qualifications<br><br>% of persons (15 years and over) who never went to school<br><br>% of persons (15 years and over) lacking fluency in English<br><br>% of persons aged 5-16 years who are not attending school<br><br>% of persons aged 15 years and over who had left school below Year 10 |
| Income level and poverty rate | % of persons whose equivalised household income below poverty line<br><br>% of persons aged 15 years and over whose annual income is $12000 or less |
| Labour force status | % of unemployed and CDEP participants over total labour force<br><br>% of working age persons not in the labour force<br><br>% of employed persons who worked less than 35 hours per week |
| Employment in low paying professions | % of males aged 15 years and over who are classified as "Labourers and related workers"<br><br>% of females aged 15 years and over who are classified as "Labourers and related workers" |

| | |
|---|---|
| Quality of housing | % of households renting (all types) |
| | % of occupied dwellings with two or more families |
| | % of households in improvised dwellings |
| | % of households with a persons to bedroom ratio of 4 or more |
| | % of households who are not satisfied with current dwelling |
| | % of households who reported main problem with dwelling is<br>"not enough living area" |
| | % of households who reported main problem with dwelling is<br>"not enough bedrooms" |
| | % of households who reported main problem with dwelling is<br>"needs repair" |
| | % of households who reported main problem with dwelling is<br>"needs better insulation /ventilation" |
| | % of households who reported main problem with dwelling is<br>"inadequate bathing facilities" |
| Health | % of foetal deaths over all births |
| | % of neonatal deaths over all births |
| | % of live births considered as low birth-weight (under 2.5 kg) |
| | % of persons aged 13 + who perceived alcohol to be the main local health problem |
| | % of persons aged 13 + who are smokers |
| Access to infrastructure and services | % of occupied private dwellings with no registered motor vehicle |
| | % of households with no running water connected |
| | % of households who travel more than 10 kilometres to attend nearest health centre |
| | % of households who do not have garbage collection |
| Other variables | % of persons aged 13 + who perceived family violence as a problem in the local area |

*Robustness*

13.     For each index constructed, various technical options for PCA were tested.  The mix of variables was also varied.  The objective was to test the robustness of the results.  For example, do the most disadvantaged regions remain the same irrespective of the PCA options used?  Are they the same irrespective of what variables are included in/excluded from the set of variables associated with Indigenous disadvantage?

*Pattern of results*

14.     The pattern of disadvantage is stable with respect to technical and data choices. When the 36 ATSIC Regions are ranked from least to most disadvantaged, and classified into four groups to be loosely termed as 'least', 'less', 'more', and 'most' disadvantaged, the ATSIC Regions tend to remain within the same group or quartile.  The table below shows the general patterns of results :

Ranking of ATSIC regions: 1996 Census data only

| LEAST DISADVANTAGED | Rank | LESS DISADVANTAGED | Rank | MORE DISADVANTAGED | Rank | MOST DISADVANTAGED | Rank |
|---|---|---|---|---|---|---|---|
| Hobart | 1 | Darwin | 10 | Cairns | 19 | Kununurra | 28 |
| Wangaratta | 2 | Wagga Wagga | 11 | Bourke | 20 | Cooktown | 29 |
| Sydney | 3 | Rockhampton | 12 | Alice Springs | 21 | Derby | 30 |
| Ballarat | 4 | Narrogin | 13 | South Hedland | 22 | Katherine | 31 |
| Brisbane | 5 | Tamworth | 14 | Ceduna | 23 | Tennant Creek | 32 |
| Queanbeyan | 6 | Roma | 15 | Mount Isa | 24 | Jabiru | 33 |
| Adelaide | 7 | Townsville | 16 | Port Augusta | 25 | Warburton | 34 |
| Perth | 8 | Kalgoorlie | 17 | Broome | 26 | Nhulunbuy | 35 |
| Coffs Harbour | 9 | Geraldton | 18 | Torres Strait Area | 27 | Aputula | 36 |

Ranking of ATSIC regions: 1996 Census + NATSIS + National perinatal data

| LEAST DISADVANTAGED | Rank | LESS DISADVANTAGED | Rank | MORE DISADVANTAGED | Rank | MOST DISADVANTAGED | Rank |
|---|---|---|---|---|---|---|---|
| Hobart | 1 | Wagga Wagga | 10 | Kalgoorlie | 19 | Kununurra | 28 |
| Brisbane | 2 | Darwin | 11 | Townsville | 20 | Warburton | 29 |
| Wangaratta | 3 | Roma | 12 | Mount Isa | 21 | Katherine | 30 |
| Queanbeyan | 4 | Coffs Harbour | 13 | Ceduna | 22 | Derby | 31 |
| Adelaide | 5 | Geraldton | 14 | South Hedland | 23 | Cooktown | 32 |
| Perth | 6 | Tamworth | 15 | Bourke | 24 | Jabiru | 33 |
| Sydney | 7 | Narrogin | 16 | Torres Strait Area | 25 | Tennant Creek | 34 |
| Rockhampton | 8 | Alice Springs | 17 | Broome | 26 | Nhulunbuy | 35 |
| Ballarat | 9 | Cairns | 18 | Port Augusta | 27 | Aputula | 36 |

Ranking of ATSIC regions: Habitat index

| LEAST DISADVANTAGED | Rank | LESS DISADVANTAGED | Rank | MORE DISADVANTAGED | Rank | MOST DISADVANTAGED | Rank |
|---|---|---|---|---|---|---|---|
| Hobart | 1 | Roma | 10 | Sydney | 19 | Port Augusta | 28 |
| Wangaratta | 2 | Darwin | 11 | Kalgoorlie | 20 | Derby | 29 |
| Wagga Wagga | 3 | Alice Springs | 12 | Mount Isa | 21 | Kununurra | 30 |
| Brisbane | 4 | Ballarat | 13 | Coffs Harbour | 22 | Katherine | 31 |
| Queanbeyan | 5 | Cairns | 14 | South Hedland | 23 | Cooktown | 32 |
| Rockhampton | 6 | Narrogin | 15 | Bourke | 24 | Tennant Creek | 33 |
| Perth | 7 | Ceduna | 16 | Broome | 25 | Jabiru | 34 |
| Geraldton | 8 | Tamworth | 17 | Warburton | 26 | Aputula | 35 |
| Adelaide | 9 | Townsville | 18 | Torres Strait Area | 27 | Nhulunbuy | 36 |

Ranking of ATSIC regions: Economic index

| LEAST DISADVANTAGED | Rank | LESS DISADVANTAGED | Rank | MORE DISADVANTAGED | Rank | MOST DISADVANTAGED | Rank |
|---|---|---|---|---|---|---|---|
| Hobart | 1 | Perth | 10 | South Hedland | 19 | Kununurra | 28 |
| Sydney | 2 | Rockhampton | 11 | Geraldton | 20 | Cooktown | 29 |
| Brisbane | 3 | Wagga Wagga | 12 | Townsville | 21 | Katherine | 30 |
| Ballarat | 4 | Tamworth | 13 | Mount Isa | 22 | Nhulunbuy | 31 |
| Wangaratta | 5 | Narrogin | 14 | Torres Strait Area | 23 | Jabiru | 32 |
| Adelaide | 6 | Kalgoorlie | 15 | Bourke | 24 | Tennant Creek | 33 |
| Queanbeyan | 7 | Roma | 16 | Broome | 25 | Derby | 34 |
| Darwin | 8 | Cairns | 17 | Ceduna | 26 | Warburton | 35 |
| Coffs Harbour | 9 | Alice Springs | 18 | Port Augusta | 27 | Aputula | 36 |

15.      Figure 2 shows the geographical distribution of Indigenous disadvantage by Indigenous Area, using the index based on the 1996 Census data only. Figure 3 shows the geographical distribution of Indigenous disadvantage by ATSIC region using the index based on Census, NATSIS and national perinatal data.

**Figure 2** MAP: INDIGENOUS SOCIOECONOMIC DISADVANTAGE INDEX: CENSUS (REFINED) IARE LEVEL
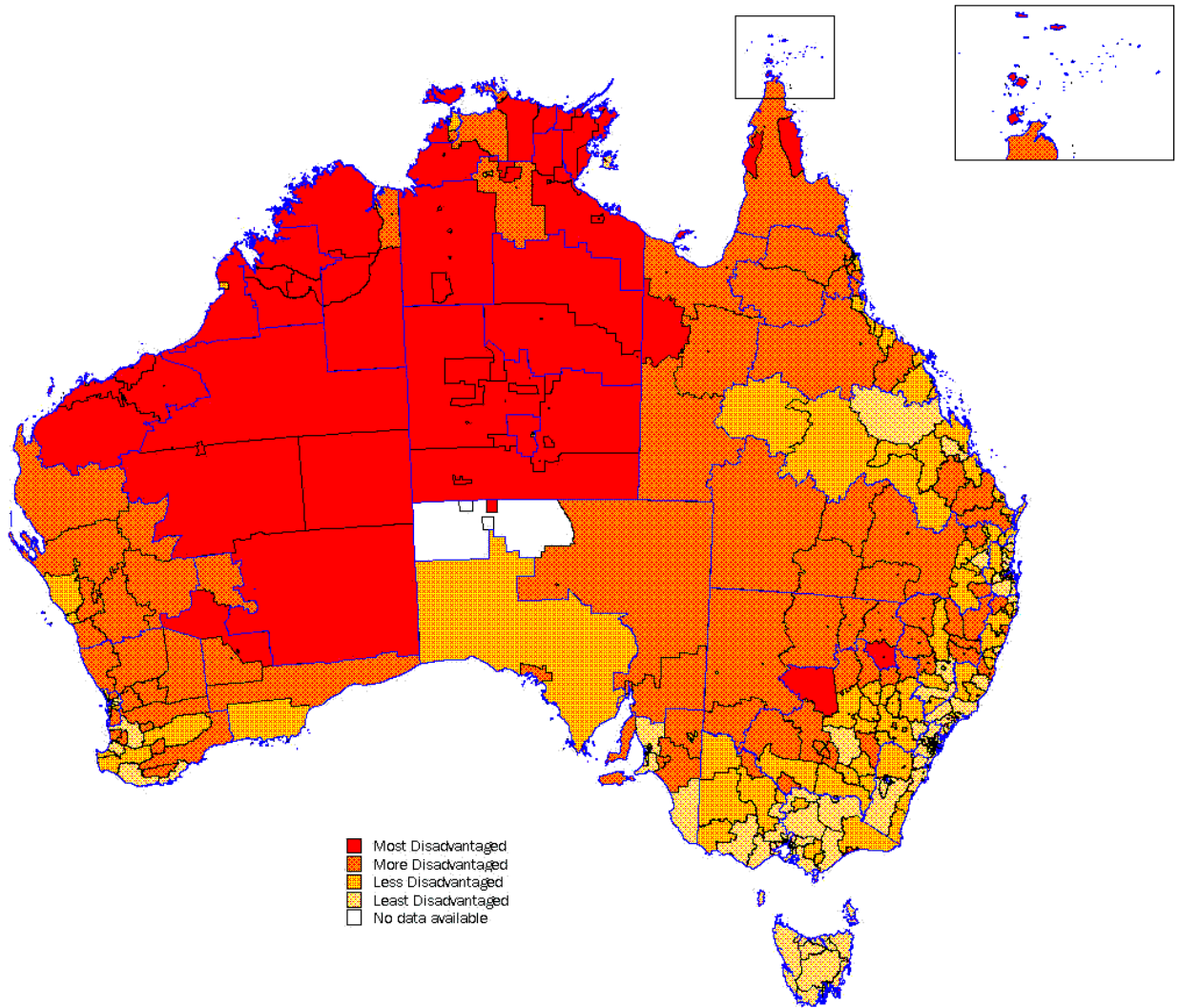
**Figure 3** MAP: INDIGENOUS SOCIOECONOMIC DISADVANTAGE INDEX: CENSUS, NATSIS AND NATIONAL PERINATAL DATA



Most Disadvantaged
More Disadvantaged
Less Disadvantaged
Least Disadvantaged
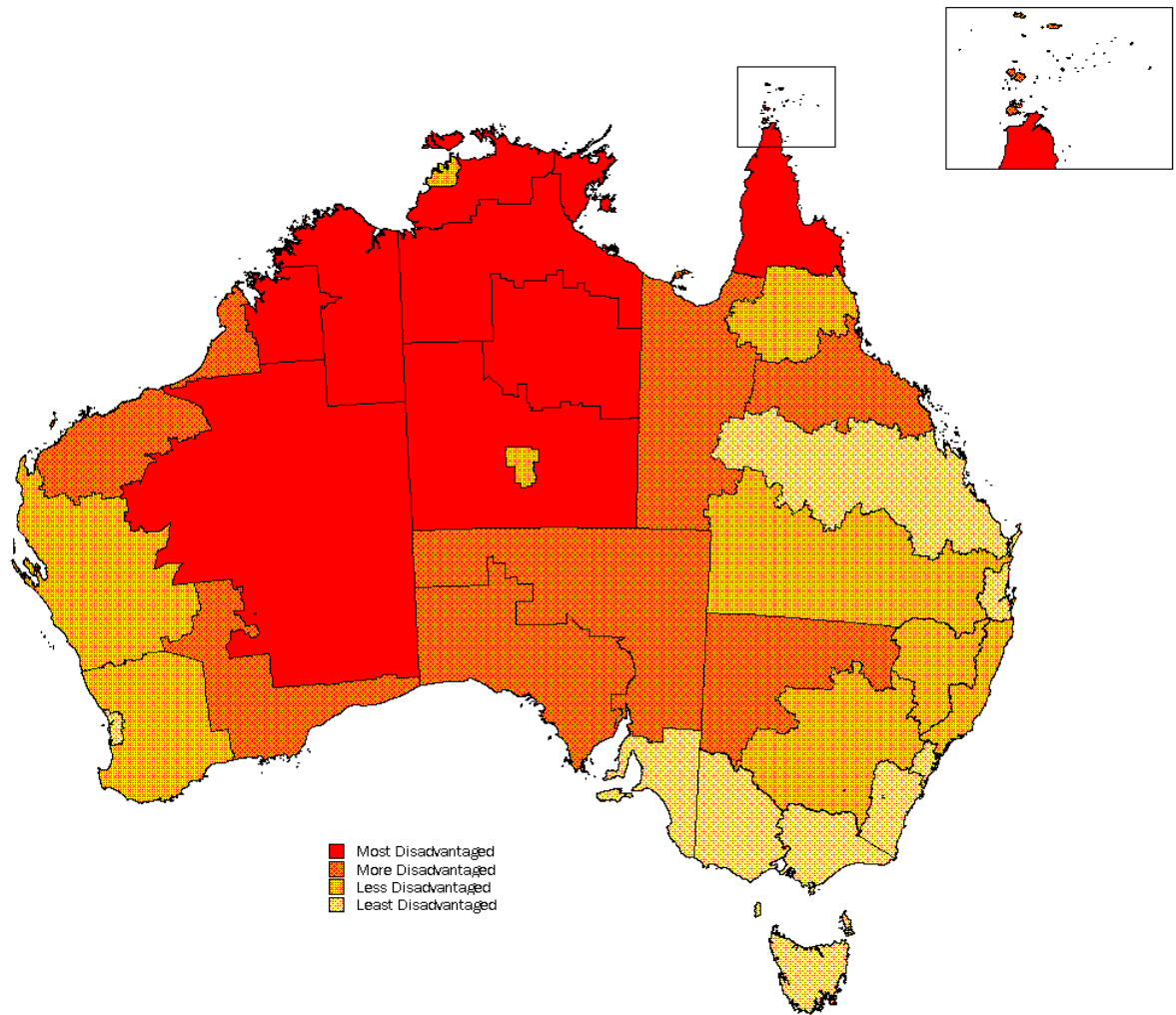
*Appropriate and inappropriate use of the index*

*It is appropriate to use the indexes to rank areas or regions in order of disadvantage in relation to a particular domain*

16.      The most appropriate use for the indexes is to rank areas or regions in order of disadvantage according to the particular data variables that are available.  The indexes created for each of the functional areas provide a number of different contexts for describing disadvantage.

*It is not appropriate to use the index as a measure of absolute disadvantage*

17.      While the ranking is calculated using a cardinal measure of disadvantage, it is not appropriate to use the numerical scores from the index as absolute measures of disadvantage.  For example, an ATSIC region with an index value of 1200 is not twice as disadvantaged as an ATSIC region with an index value of 600.  Similarly, the socioeconomic difference between two ATSIC regions with index values of 800 and 900, is not necessarily the same as the difference between two ATSIC regions with index values of 1050 and 1150.

*It is appropriate to use the indexes to supplement rather than to replace the user's understanding of Indigenous disadvantage.*

18.      The index does not cover every conceivable aspect of Indigenous disadvantage.  Even if it did, most data sets are subject to quality concerns and limited in scope or depth.  For example, it is not possible for the indexes reported here to take into account the value of strong social networks, membership of a community, loyalty or responsibility to family, cultural or ceremonial wealth which are important to Indigenous communities.  The user of the index has to keep information on these other possibly unquantified aspects of disadvantage as background information.  The appropriate use of the indexes should supplement, and in some cases confront and test, but should not replace that prior knowledge.

19.      Figure 4 demonstrates how the PCA-determined ranking sits with the results of various separate assessments.   The user starts with an understanding of Indigenous disadvantage and an implied ranking of the different Indigenous geographical areas.  On the right hand side is the ranking from the Principal Component Analysis reported in this study.  In some cases there can be agreement between the ranking based on prior information.  However in many cases the prior implied ranking and the PCA-based ranking will differ.  In these cases it is not appropriate to automatically replace the prior ranking with the PCA-based ranking without first examining whether the prior ranking had missed something important.  It is also possible that the PCA-based ranking is derived from information that did not fully capture a required facet of disadvantage.

**Figure 3**  USING   INDEXES   OF   INDIGENOUS   SOCIOECONOMIC DISADVANTAGE

Assessment by User

Implied overall rankings

PCA ranking

1
2
...

...

compare

1
2
...
...
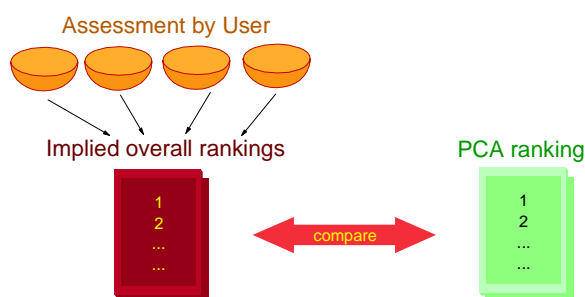
*It is appropriate to use the index only for the level of geography for which it is designed*

20.    The indexes discussed in this paper treat the geographic region that it is ranking as though the circumstances within this region are fairly homogeneous.  This is rarely the case, even when dealing with small or disaggregated areas.  For example, it is possible to have pockets of local level, severe socioeconomic disadvantage in an area which the model identifies as least disadvantaged.  Thus if location 'a' is in ATSIC region 'A' and area 'b' is in ATSIC region 'B', it is inappropriate to infer an ordering between 'a' and 'b' from an ordering of 'A' and 'B'.

*Use of the index in research and data analysis*

21.    In terms of index construction technique, the indexes reported here are similar to the Socioeconomic Indexes for Areas (SEIFA), and can thus be used in ways similar to those suggested in ABS (1998a, p. 7), that is:

> 'The indexes may be useful for modelling or explaining behaviour in other variables.  In some studies it is desirable to determine if socioeconomic factors are influencing a variable of interest.  The researcher may also be interested in reducing the number of variables in the analysis.  In such cases, one or more of the indexes can be used as a summary of a range of socioeconomic factors.'

*Targeting areas for services and funding*

22.    The indexes are summaries of a wide range of socioeconomic data.  It is thus appropriate to use the indexes in the selection of areas or ATSIC regions for services or differential funding on the basis of differential socioeconomic disadvantage.

23.    It is not, however, appropriate to use index scores to computationally fine-tune the allocation of services or funds.  For example, as pointed out earlier, an ATSIC region with an index value of 1200 is not twice as disadvantaged as an ATSIC region with an index value of 600.  Thus it would be inappropriate to infer that an ATSIC region with an index value of

1200 should, for example, receive twice the funds that are allocated to an ATSIC region with an index value of 600.

*Outline of the main report*

24.     The main report is divided into six sections:

  (i)  Section 1 gives the background and scope of the study.

  (ii)  Section 2 describes the concept of disadvantage, and proposes indicators from Census and other data sources which can capture various aspects of Indigenous disadvantage.

  (iii)  Section 3 describes data sources and discusses data quality issues with an emphasis on the implications of data quality for the indexes constructed.

  (iv)  The methodology used to construct the indexes is discussed in Section 4.

  (v)  Results are presented in Section 5.  Various analyses to test the robustness of the results are also presented in this section.

  (vi)  Section 6 concludes the report by outlining possible areas of future research and ways in which the indexes and the index construction methodology can be improved.

# CONSULTANT'S REPORT

# COMMONWEALTH GRANTS COMMISSION

# CONSULTANCY

## by

# AUSTRALIAN BUREAU OF STATISTICS

# 2000

## INTRODUCTION

25.     The Commonwealth Government recently asked the Commonwealth Grants Commission to undertake an Indigenous Funding Inquiry with a reporting deadline of 28 March 2001.  As part of that inquiry the Commission has asked the ABS to derive indexes of relative socioeconomic disadvantage that could be used as background information in determining distributions of resources across different Indigenous geographic regions and functional areas.

26.     The Commission has specified that the indexes to be created:

   (i)  will be used to compare one Indigenous region with another, not to compare the Indigenous population and the non-Indigenous population;

   (ii)  should cover the whole Indigenous population, not just discrete Indigenous communities;  and

   (iii)  should be presented at ATSIC Region level, but a more disaggregated level (if possible) is also required.

27.     The terms of reference for the ABS study are in Appendix 1.

28.     The main aim of this paper is to describe the construction of various experimental indexes of socioeconomic disadvantage based on information from the 1996 Census of Population and Housing, 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS), and perinatal data from the Australian Institute of Health and Welfare's National Perinatal Statistics Unit.

29.     A key element of the study relates to discussing the quality of data used for the experimental indexes, and of other available data including the 1999 Community Housing and Infrastructure Needs Survey (CHINS), National Health Survey, Australian Housing Survey, and hospital separations data from the National Hospital Morbidity Database (AIHW).

30.     Nine experimental indexes have been constructed:

   (i)  a general index based on data from the 1996 Census;.

   (ii)  a decomposition of the index in (i), by accessible, moderately accessible and remote areas;  and

   (iii)  a general index based on melded Census, 1994 NATSIS and National Perinatal Data.

***Indexes specific to economic and habitat aspects of disadvantage:***

    (iv)   an economic index —— a disaggregated index that captures disadvantage related to employment, income, and education;

    (v)   a habitat index —— a disaggregated index that captures disadvantage related to housing, infrastructure and health.

***Indexes specific to functional areas:***

    (vi)   an education index —— the index in (iv) minus the employment and income variables;an employment and income index— the index in (iv) minus the education variables;

    (vii)   an employment and income index — the index in (iv) minus the education varaibles

    (viii)   a housing and infrastructure index; and

    (ix)   a health index based on NATSIS and perinatal statistics. (An alternative health index, based on hospital utilisation, was also derived using data from the 1997-98 National Hospital Morbidity Database).

31.    The paper shows the ranking of Indigenous regions based on these indexes, interprets the results and illustrates how to use the indexes.

## 2.  INDIGENOUS DISADVANTAGE

### *2.1  The concept of a disadvantage index*

32.    An index is a summary measure, constructed using a selected model.  Any model is an abstraction from the real world and it is important that the limitations of a model used in constructing the index are understood.

33.    An index is a composite measure derived from indicators.  It is a weighted combination of two or more indicators and summarises the available data.  An index is only as good as the quality of the statistics and/or indicators on which it is based.  The construction of a disadvantage index involves difficult decisions regarding which indicators to combine.  Most data sets are subject to data quality concerns, are limited in scope or depth and may not contain data on all the variables or indicators which an analyst considers to be relevant.  For example, it is not possible for the indexes reported here to take into account the value of strong social networks, membership of a community, loyalty or responsibility to family, cultural or ceremonial wealth which are important to Indigenous communities.

34.    The indexes in this report would provide information about the rankings of areas' disadvantage, but not about absolute or relative levels of disadvantage. Therefore the indexes do not refer to any quantum of need nor say anything about the size of differences in socioeconomic status.  They are intended to rank areas according to the constituent population's deprivation of (or inability to command) resources which support well-being or participation in social and economic life.

35.    The indexes discussed in this paper treat the Indigenous geographic regions as though the circumstances within the regions are fairly homogeneous.  This is rarely the case, even when dealing with small or disaggregated areas.  For example, it is possible to have pockets of local level, severe socioeconomic disadvantage in an area, which the model identifies as least disadvantaged.  The use of any index even as background information must be undertaken with due care.

36.    The main advantage of using an index is that it provides a summary of a wide range of variables which describe disadvantage.  With over one hundred variables it would be difficult to analyse variables individually and then develop an overview and a ranking of all 684 Indigenous Areas.

### *2.2  Indicators of Indigenous disadvantage*

37.    Indigenous disadvantage is a multi-dimensional socioeconomic phenomenon.

38.    Information from ABS (1998a) and an initial process of consultation suggested more than a hundred possible indicators of Indigenous socioeconomic disadvantage, falling into 9 broad categories, namely:

(i)  levels of educational attainment;

25

    (ii)  cultural disadvantage;

   (iii)  family structure;

   (iv)  income levels and the poverty rate;

    (v)  labour force status;

   (vi)  employment in lowpaying occupations;

  (vii)  quality of housing;

 (viii)  access to infrastructure and services (schools, medical, transport); and

   (ix)  health.

39.     Appendix 2 summarises the variables considered for inclusion in the various indexes of Indigenous socioeconomic disadvantage.  Details on the data sources for these variables are discussed in Section 3.  Selection of each variable is based on the underlying hypothesis that as the proportion of the measured variable increases, the degree of disadvantage increases.  Section 4 discusses the approach used to convert a list of indicators into an index using the technique of Principal Components Analysis.

### 2.2.1  Levels of educational attainment

40.     One of the major labour market disadvantages experienced by Indigenous people is related to their levels of education.  Among Indigenous people aged 15 years or more in 1996, about 40 percent said they had left school before age 16 years.  Only 2 percent of Indigenous adults aged 15 years and over in 1996 had completed a Bachelor degree or higher.  About three out of four Indigenous adults said they had no post-school educational qualifications.

41.     From the 1996 Census, four variables were derived to represent low levels of educational attainment. These include:

    (i)  the proportion of Indigenous persons aged 15 and over with no qualifications;

   (ii)  the proportion of Indigenous persons aged 15 and over who have not completed 10 years of schooling;

  (iii)  the proportion of Indigenous people aged 15 and over who did not go at all to any school;  and

  (iv)  the proportion of persons aged 15 and over who lack fluency in English.

The latter may indicate a reduced capacity to effectively engage in economic, social, legal and political mainstream activities, which assume a minimum level of education and fluency in English.

42.     Likewise, five indicators from NATSIS were examined:

(i)   the proportion of persons aged 5 to 18 years who were not attending school in 1994;

(ii)  the proportion of persons aged 15 years and over who had no post-school qualifications in 1994;

(iii) the proportion of persons aged 15 years and over who had left school in 1994 before completing year 10 education;

(iv)  the proportion of persons who in 1994 had not completed year 12;  and

(v)   the proportion of persons who had not completed year 10.

Data quality assessments of selected NATSIS variables follow in Section 3.

### 2.2.2  Cultural disadvantage

43.     When preliminary results were presented at a seminar on 30 October 2000, one of the criticisms of the experimental indexes was that they did not take into account cultural disadvantage of Indigenous populations. Further investigations identified two variables from NATSIS which could be used to capture aspects of cultural disadvantage.  These were:

(i)   NOLANG:  the proportion of Indigenous persons that DO NOT speak an ATSI language; and

(ii)  SPKLANG:   the proportion of Indigenous persons that speak an ATSI language.

44.     The variable NOLANG was included as a cultural disadvantage variable.  That is those ATSIC regions where there is a low proportion of Indigenous people that speak an Indigenous language are considered to be more culturally disadvantaged. The higher this proportion is it was hypothesised, the higher the level of cultural disadvantage.  However the NOLANG variable was negatively correlated with disadvantage and was removed from the analysis.

45.     The variable SPKLANG would be considered an advantage variable.   The higher the proportion of the population in a region that speaks an Indigenous language the more culturally advantaged the region is.  It is thus an advantage index variable and not considered appropriate for the analysis conducted in this paper.

46.     A possible explanation for these counter-intuitive results is that these two variables are of very poor quality.  For example:

(i)   the standard errors (SE) for NOLANG and SPKLANG are above 25% for two of the regions (Nhulunbuy and Aputula);

(ii)  the variables have many instances where a *'Not Stated'* was recorded;  and

(iii) because of traditional sensitivities associated with some cultural questions, a level of under-reporting is expected.

For these reasons the cultural variables were not considered any further in the construction of the experimental indexes of disadvantage.

### 2.2.3 Family structure

47.     The Census defines a family as 'two or more persons, one of whom is at least 15 years of age, who are related by blood, marriage (registered or de facto), adoption, step or fostering, and who are *usually resident* in the same household.' Identifying the presence of either a couple relationship, lone parent-child relationship or other blood relationship forms the basis of a family.  Some households therefore, contain more than one family. Non-related persons living in the same household are not counted as family members (unless under 15 years of age).

48.     An Indigenous family is one where either the reference person or spouse is of Aboriginal/Torres Strait Islander origin.

49.     One of the variables that reflect a weak family structure is the proportion of sole parent families. In 1996, Indigenous sole parent families represent 38 percent of Indigenous families with children under 15 years of age.  Analysis of Census data shows that Indigenous sole parents are relatively young, have low educational status, are less likely to be in the labour force, and have high childhood dependency burdens to bear.  They are likely to be wholly reliant on Parenting Allowance (previously known as the Sole Parent Pension).  This high level of welfare dependence implies a long-term absence from the labour market and entrenched poverty (Daly and Smith 1998).

50.     Thus from the Census a variable showing the proportion of families headed by single parents was derived. To crosscheck, a related variable was derived from NATSIS, ie the proportion of persons aged 15 years and over who received Sole Parent Pension.

### 2.2.4 Income levels and the poverty rate

51.     A critical area of Indigenous economic disadvantage is the continuing, relatively low levels of Indigenous (individual, family or household) incomes.  The median weekly individual income for Indigenous persons was $218; the median weekly family income of Indigenous families was $502.

52.     Despite their larger average size (3.7 persons per household), Indigenous households had a relatively low median weekly income ($540).  Some 29 percent of Indigenous households had weekly incomes at or below $399, and 32 percent had incomes of between $400 and $799.

53.     The proportion of persons, families or households falling below a certain income cutoff (usually the poverty line) was considered an important disadvantage indicator. When computing these indicators, it was noted that poverty could be any of:

   (i)   absolute poverty, where a unit's income does not pay for basic necessities such as shelter and food;

   (ii)  relative poverty, where a unit's income is low in comparison to the income of other families;  and

(iii)  subjective poverty, where a unit's income is self-perceived as inadequate for its need.

54.  In this paper, the concept of relative poverty is applied.  Poverty is measured relative to the incomes of other Indigenous income units.  An income unit is a group between whom income is assumed to be shared.  In this paper, both family and household incomes are examined. The latter is particularly important because of widespread comment that among the Indigenous people, the concept of a household is more applicable than a family. Extended family networks and high mobility have implications for income (as a source and as a shared resource). For an exposition of the issue see Ross 1998 (Sienna Group paper).

55.  An equivalised income was computed from the 1996 Census and this was used to compute the poverty incidence. An equivalised income takes into account the size or composition of the family or household. Section 4.2 explains the methodology used in adjusting income values using an equivalence scale.

56.  From NATSIS, two poverty-related indicators were also examined:

(i)  the proportion of persons aged 15 years and over whose annual income is $12, 000 or less;  and

(ii)  the proportion of persons aged 15 years and over whose main source of income is government payments.

Table 2 comments on the quality of the two variables.

### *2.2.5  Labour force status*

57.  Unemployment is recognised to be linked not only with low economic resources, but a range of other factors which confound disadvantage — lack of personal confidence, alcoholism, high crime and victimisation rates, increased marginalisation and stress.

58.  At the time of the 1996 Census, about 41 percent of Indigenous people aged 15–64 years said they were employed (including employment in Community Development Employment Projects (CDEP) scheme jobs), 12 percent said they were not employed but were looking for work and 47 percent were not in the labour force (neither working nor looking for work).

59.  Since the unemployment rate is calculated as a percentage of those in the labour force, this means that the unemployment rate at the time of the Census was 23 percent for Indigenous people (ABS 1998b).

60.  Labour market Indicators from the Census and NATSIS may provide clues to relative Indigenous labour market disadvantage.  These include proportion of working-age persons who are unemployed, proportion of persons working under the CDEP scheme, and proportion of working-age persons not in the labour force.  Appendix 2 shows the various forms of labour force indicators that the study looked at.

### 2.2.6 *Employment in low paying occupations*

61.     Indigenous people have a disproportionate reliance on low-skilled, low status jobs.  They have a continuing over representation in unskilled labouring jobs such as plant and machine operators, and a relative absence from professional, managerial and clerical jobs.  For example, in 1996, one in four employed Indigenous people were working as labourers and related workers.

62.     Thus in this report percentage of Indigenous people employed in selected low-skilled occupations was also considered.  The occupations selected require limited levels of education and tend to be low paying.  Again the hypothesis is that there is a relationship between high concentration of people in these occupations and disadvantage.

### 2.2.7 *Quality of housing*

63.     The 1996 Census contains a number of variables on housing.  This study retains four variables in the assessment of Indigenous disadvantage.  One variable relates to the percentage of households in rented accommodation.  It is hypothesised that the higher the percentage of households in rented accommodation in an area the higher the likelihood that the area is disadvantaged.  Two of the variables relate to overcrowding and the last variable looks at the quality of the accommodation in terms of whether it is improvised or not.  The hypothesis is that improvised housing is the lowest quality type of housing available in Australia.  The higher the percentage of individuals or families that live in improvised housing in an area, the more likely it is that the area is disadvantaged.  Choice though is not always an element in housing considerations.  For example, in some communities there is no scope for individual ownership.

64.     With respect to overcrowding, a crowded dwelling often suggests that there are two or more families in the household, with high rates of adult unemployment, high visitor numbers and dependent children.  Overcrowding leads to a faster deterioration in the condition of housing and the exacerbation of environmental health problems, and creates 'visitor-induced' stress on social relations and on the expenditure capacity of Indigenous households (Smith and Daly 1996).

65.     An additional nine variables on various aspects of the quality of Indigenous housing were also obtained from NATSIS.  Table 2 indicates (where data is available) the quality of these variables.

### 2.2.8 *Access to infrastructure and services*

66.     Lack of access to a family car is used as an indicator of low mobility.  Low mobility limits an individuals capacity for social and economic engagement.

67.     This study also investigated the use of the Accessibility/Remoteness Index of Australia (ARIA) which, when combined with low mobility, is hypothesised to impact on Indigenous disadvantage.   Separate indexes were constructed for three broad area classifications based on ARIA (accessible, moderately accessible and remote) scores.  Section 4.1.1 explains in detail the derivation of ARIA.

68.    Finally, there are four NATSIS variables which describe some elements of access to infrastructure and services.  These relate to running water, electricity, garbage collection and whether the local road is sealed.  All these variables are listed in Appendix 2.

### 2.2.9 Health

69.    The 1996 Census does not have data on health.  In order to fill the data gaps, a number of other data sources were examined to determine which ones could provide adequate coverage of Indigenous health.  These sources were:

   (i)  NATSIS;

   (ii)  National Health Survey;

   (iii)  National Perinatal Data;  and

   (iv)  Hospital separations data

70.    ***NATSIS health variables.***  While the 1994 NATSIS covered a number of health-related items, as listed in Appendix 2, none of them were used in the index because of poor data quality.  Table 2 shows a number of variables which seemed to be of good quality from a sampling error perspective.  However, most of the variables were affected by significant non-sampling errors.

71.    ***National Health Survey.***  Data quality assessments of the 1995 NHS found that the majority of variables in the Indigenous supplement to be of poor quality, especially at the geographic levels required in this study (ie ATSIC Region and Indigenous Area).  The few that were of good quality could not be used in the construction of indexes in this paper because the geography and perspective adopted for NHS is different from those of this paper.  For example, the NHS does not provide estimates by ATSIC region.  Consequently its results could not be integrated into this study which uses the ATSIC region as the highest level of aggregation.

72.    ***National Perinatal Data.***  Several disadvantage indicators were obtained from the National Perinatal Statistics Unit (NPSU) of the Australian Institute of Health and Welfare (AIHW).  These data are derived from State and Territory perinatal data collections, in which midwives and other staff, using information obtained from mothers and from hospital or other records, complete notification forms for each birth.  The information collected includes baby's birth status (live birth or stillbirth), sex, and birth weight.

73.    In constructing the index, the following indicators (in various formats listed in Appendix 2) were considered:

   (i)  foetal deaths as proportion of all births;

   (ii)  neonatal deaths as proportion of all births;

   (iii)  perinatal deaths as proportion of all births;  and

   (iv)  low birth-weight babies as proportion of all live births.

74.    ***Hospital separations data.***  Hospital separations data were obtained from the National Hospital Morbidity Database (NHMD), which is also managed by the AIHW.  The

information in the NHMD is provided to the AIHW by health authorities in each State and Territory. The database includes information on the characteristics, diagnoses and care of admitted patients in public and private hospitals across Australia. Permission to access, analyse and publish the data was sought and received from the relevant State and Territory authorities.

75. Data included in the NHMD are for admitted patients (ie excluding outpatients) in almost all Australian hospitals, including public acute, psychiatric and repatriation hospitals as well as private acute and psychiatric hospitals and free-standing day hospital facilities. No data were available from a few small public and private hospitals (for more details, see AIHW 1999, pp. 2–3).

76. The data used in this report relate to hospital separations which occurred during the period 1 July 1997 to 30 June 1998. Data for patients who were admitted on any date before 1 July 1998 are included, provided that they also separated between 1 July 1997 and 30 June 1998. A record is included for each separation, not for each patient, so patients who separated more than once in the year have more than one record in the data.

77. A hospital separation occurs when a patient is discharged, is transferred to another facility or dies, or when the type of care changes (from acute to rehabilitation, for example) (AIHW 1999). Hospital statistics are based on separations rather than admissions because more information is available at the end of a patient's stay in hospital than at the beginning, such as information about diagnosis, length of stay, procedures performed, etc. Data refer to separations (that is, episodes of care) rather than to individual people. An individual may have been admitted to (and separated from) hospital on more than one occasion during the year, and each hospital separation would be included in the data. For example, some patients with kidney disease may have had three recorded separations each week just for their routine dialysis treatment.

78. The conditions diagnosed and the procedures undertaken during each episode of care were coded according to the International Classification of Diseases, 9th Revision (ICD-9-CM) (National Coding Centre 1996). Principal diagnosis is defined as 'the diagnosis established after study to be chiefly responsible for occasioning the patient's episode of care in hospital', while principal procedure is defined as 'the most significant procedure that was performed for the treatment of the principal diagnosis' (National Health Data Committee 1998). Although information on additional diagnoses and procedures is available in the NHMD, variability in coding practices by hospital and/or jurisdiction (for example, in the number of additional diagnoses or procedures which can be recorded) mean that such data may not be sufficiently comparable to warrant analysis. Thus, in this report we present rates by principal diagnosis only.

79. A health index was constructed using the hospitalisation rates for certain diseases which reflect socioeconomic disadvantage. These indicators are explained in Appendix 6.

### 2.2.10 Other indicators

80. Finally three 'other variables' were included from NATSIS. These variables do not fall into any of the above categories but they have been identified as possible indicators of socioeconomic disadvantage. These are:

 (i)   proportion of persons aged 13 years and over who have been assaulted or attacked in the last five years (before the 1994 NATSIS);

 (ii)   proportion of persons aged 13 years and over who have been arrested in the last five years;  and

(iii)   proportion of persons aged 13 years and over who perceived family violence as a major local area problem.

## 3.  DATA SOURCES AND DATA QUALITY ISSUES

81.     Stage 2 has examined the following potential sources for disadvantage indicators:

  (i)   1996 Census of Population and Housing (Census);

  (ii)  1994 National Aboriginal and Torres Strait Islander Survey (NATSIS);

  (iii) 1994-96 AIHW Indigenous mothers and their babies;

  (iv)  1999 Community Housing and Infrastructure Needs Survey (CHINS); and

  (v)   1997-98 Hospital separations administrative data.

82.     The 1996 Census data is currently the best data set available with Australia-wide coverage of the Indigenous population.  The Census covers a wide range of socioeconomic factors such as housing, employment, education and income levels.

83.     The NATSIS survey was undertaken in 1994 and covers areas such as health, housing, education, employment, law and justice.  The survey aimed to deliver data that would provide an important benchmark for monitoring changes in the well being of the Indigenous people.

84.     The national perinatal collection is an administrative by-product data on the health status of Indigenous mothers and their babies.  Data are collected from States and Territories, which are then melded into a national dataset.

85.     The CHINS was conducted in 1999 and collected housing and management information from Aboriginal and Torres Strait Islander housing organisations and a range of community infrastructure information for locations identified as discrete communities.

86.     The hospital separations administrative data used in this report relate to hospital separations which occurred during the period 1 July 1997 to 30 June 1998.  Data for patients who were admitted on any date before 1 July 1998 are included, provided that they also separated between 1 July 1997 and 30 June 1998.  A record is included for each separation, not for each patient, so patients who separated more than once in the year have more than one record in the data.

### *3.1 Census of Population and Housing*

87.     The 1996 Census is currently the best data set available with Australia-wide coverage of the Indigenous population.  Because it is a Census (as opposed to a survey), it is not exposed to sampling errors.  But like other collections there are elements, often not measurable, of non-sampling error.  These arise from inaccuracies in collecting, recording and processing of the data.  The most significant of these errors are mis-reporting of data items; deficiencies in coverage; non-response; and processing errors.

88.     The data quality issues that need to be considered when using the Census for Indigenous population-related analyses are explained in detail by Ross (1999). The following discussion summarises these problems and outlines an approach that the ABS has adopted to test the sensitivity of the experimental index to these data quality problems.

89.     ***Data staleness.*** At the time of the analysis reported here, the 1996 Census data is four years out-of-date. This is a concern particularly with the Indigenous population which seems to be relatively mobile over time (Taylor 1996). However, relative socioeconomic disadvantage of an area does not change significantly over time. It is unlikely that over the last five years significant changes have taken place to drastically change the relative ranking, particularly of the most disadvantaged Indigenous Areas.

90.     ***Indigenous identification.*** The increase in the number of Indigenous people counted in the Census between 1991 and 1996 is larger than can be explained by demographic effects (births, deaths and migration) and the population-expanding effects of mixed Indigenous and non-Indigenous parentage.

91.     Ross (1999) suggests that there is some uncertainty about how respondents might interpret the question on the Census form which asked 'Are you of Aboriginal or Torres Strait Islander origin?' It is also uncertain whether responses to this question might differ if the method of administering the question were to be changed.

92.     The jump in Indigenous identification means that it will be difficult to test the inter-temporal robustness of results on Indigenous disadvantage between 1991 and 1996.

93.     ***Indigenous locations and areas with poor data quality.*** There are known errors in Indigenous Census data. These errors may be small when the whole Australian population is considered, but when the Indigenous population is studied in isolation these errors become significant. Eight of the 692 Indigenous Areas have problems with data quality and have therefore been excluded from this analysis, leaving us 684 Indigenous Areas to rank. Ross (1999) gives a detailed description of the data quality issues affecting these eight areas. The eight areas are listed below.

**Table 1:**     INDIGENOUS AREAS WITH POOR CENSUS DATA QUALITY

| Indigenous area code | Indigenous area name |
|---|---|
| 1506 | Yam Island |
| 1901 | Balance AP lands |
| 1902 | Indulkana (Iwantja) |
| 1903 | Fregon (Kaltitji and Irintata) |
| 1904 | Amata and homelands |
| 2203 | Wyndham-Ekimb: Oombulgurri |
| 3202 | Warlpiri/Regum/Wallaby camps |
| 3204 | Rockhole |

94.     ***Census non-responses.*** Census non-responses are a further impediment to index construction. Although non-response to individual Census items is quite low overall, it does vary between areas, and may be high for some groups of Indigenous people. It is possible that item non-response rates correlate directly with socioeconomic disadvantage.

95.     Where possible, non-response for a variable has been dealt with (in this study) by redefining the population associated with the variable, to include only those persons who

answered the relevant questions. This approach implicitly assumes that non-respondents within an area resemble respondents in that area, with respect to the characteristics measured by the variables.

96. ***Place of enumeration versus place of residence.*** The Census tables on social and economic aspects of the population are based on people's place of enumeration and not their usual residence. This classifies the population to areas according to where they were spending the night at the time of the Census.

97. The Indigenous population has a relatively high level of short-term mobility and inter-household visitations may cross Indigenous geography boundaries. Thus an index based on people's place of enumeration may not effectively identify the characteristics of an area whose individuals frequently shift location.

98. ***Community Development Employment Programs (CDEP).*** Community Development Employment Programs (CDEP) scheme data were collected for the first time in the 1996 Census. Census counts of persons employed in the CDEP scheme tend to be lower than the counts of CDEP participants from ATSIC for 1996. The nature of CDEP work can be sporadic and although a person is recorded by ATSIC as being a CDEP participant this does not mean that he or she will be working in any given week. CDEP participants who did not work in the week prior to Census will not be recorded as employed although they will be recorded by ATSIC as participants.

99. Ross (1999) suggests that the quality of Census CDEP data can be considered to be good when the Census CDEP figure is around 60 percent or more of the ATSIC figure. According to Ross (1999, p66) this condition is satisfied in only five of the 36 ATSIC Regions.

### 3.2 National Aboriginal and Torres Strait Islander Survey (NATSIS)

100. There are general quality issues which need to be taken into account when interpreting results from the NATSIS.

101. ***Benchmarking to 1991 Census.*** The NATSIS survey was undertaken in 1994, but the counts for purposes of sample selection were benchmarked to the 1991 Census. These benchmarks were used to weigh NATSIS in such a way that the 1991 relativities between the ATSIC Regions within each State were maintained.

102. These relativities have data quality problems arising from the:

   (i) possible under-count of Indigenous people in 1991 Census;

  (ii) time variability of the propensity to identify as Indigenous;  and

 (iii) variation in identification as Indigenous depending on whether the questionnaire was administered face to face by an interviewer, or self completed (Carson 1999, unpublished).

103. ***There may have been an undercount of Indigenous males in NATSIS.*** In NATSIS there is a sample undercount of males in some age groups, particularly 15 to 19 and 24 to 44. This may be linked to the problem of propensity to identify as Indigenous. This propensity may be age and sex dependent. NATSIS contained less males between the ages 24

and 44 than expected on the basis of the 1996 Census. It may be that males between ages 24 and 44 are less likely to identify as Indigenous than other age groups. (Carson, 1999, unpublished)

104.    ***There may have been an undercount of Indigenous infants in NATSIS.***  There also seems to be a sample undercount of infants of zero to 4 years of age. Thus there may be bias in data due to this undercount. Even though benchmarking to 1996 Census reduces the problem, there is residual bias due to the likelihood that infants not counted may have had different attributes to those counted. (Carson, 1999, unpublished).

105.    ***There may be 'interviewer bias' in NATSIS.***  Results can vary depending on the data collection method used. The use of interviewers may have led to interviewer bias where respondents answer differently from how they would have answered in a self-administered questionnaire.

106.    ***There are significant non-response bias in NATSIS data.***  There were cases where respondents did not respond to questions:  for example, in the case where questions were dealing with sensitive issues.

107.    ***There are data quality problems arising from non-reporting of health conditions in NATSIS.***  The health data in NATSIS may not be reliable. One interviewer noted that many health conditions were not originally reported at the household interview stage. Some conditions that appeared obvious were able to be picked up at household level. However, on many occasions local health service providers were present at the initial visit to communities and they would advise which respondents had certain illnesses.

108.    What is not clear is what level of under reporting of medical conditions occurred in those cases where local health service providers were not present at the time of interview with respondents. Similarly, many people with reported medical conditions did not know the specifics of their condition or the medication prescribed. Again, local health clinic staff assisted in this regard.

109.    At those communities with no health clinic it was up to the respondent to recall the information and in some cases it was highly likely that conditions/medications were not reported, resulting in a loss of information (ABS — Unpublished Field Report).

110.    ***Lack of English/literacy skills.***  This led to a lack of understanding of questions in the written form. It was easier and culturally acceptable to engage in a conversation style interview with no direct questions. This however, could lead to a bias of results due to the changing of the questions and therefore not asking standard survey questions. For example, the NATSIS Law and Order question:

> 'In the last 5 years have you been arrested by the police?' was sometimes changed to 'Has policeman got you?' by the interpreter.

111.    The table below outlines the NATSIS variables considered for analysis. They were assessed with respect to sampling and non-sampling errors and issues .

**Table 2**   QUALITY OF SELECTED NATSIS VARIABLES

| Variable[a] | Description | Sampling error -related data quality assessment | Non-sampling data quality issues |
|---|---|---|---|
| **Educational Attainment** | | | |
| 5 – NATNOSCH | Proportion of Indigenous persons aged 5-18 years who are not attending school | Estimates of this variable had low sampling errors for all regions (ABS 1997d) | - |
| 8 – NOPOSTQ | Proportion of Indigenous persons aged 15 years and over who had no post-school qualification | Estimates of this variable had low sampling errors except for Roma and Nhulunbuy (ABS 1997c p.57) | Differences in level of education between rural and urban areas may have affected the quality of answers in rural areas (Dean Carson 1999, ABS unpublished). |
| 9 - LEFTS10 | Proportion of Indigenous persons aged 15 years and over who had left school below Year 10 | Estimates of this variable had low sampling errors for all regions (ABS 1997d) | Indigenous education may be spasmodic and broken.  Thus years of schooling completed do not equate to years of education obtained. |
| 10 - COMPYR12 | Proportion of Indigenous persons that did not complete year 12 | Estimates of this variable had high sampling errors for many regions (ABS 1997d) | Indigenous education may be spasmodic and broken.  Thus years of schooling completed do not equate to years of education obtained. |
| 11 - COMPYR10 | Proportion of Indigenous persons that did not complete year 10 | Estimates of this variable had low sampling errors (ABS 1997c, p.57) | Indigenous education may be spasmodic and broken.  Thus years of schooling completed do not equate to years of education obtained. |

**Table 2**   QUALITY OF SELECTED NATSIS VARIABLES

| Variable[a] | Description | Sampling error -related data quality assessment | Non-sampling data quality issues |
|---|---|---|---|
| **INCOME** | | | |
| 21 – YGOVPAY | Proportion of persons aged 15 years and over whose main source of income is Government Payments | Estimates of this variable have low sampling errors (ABS 1997c) | Non-response - 11% did not state sector of employment (Dean Carson 1999, ABS unpublished). |
| 22- LOWINC | Proportion of persons aged 15 years and over whose annual income is $12,000 or less | Estimates of this variable have low sampling errors on the income variable except in Roma, Warburton and Derby (ABS 1997c) | Non-response - 18% did not state household income and 15% did not state family income (Dean Carson 1999, ABS unpublished). |
| **Labour Market** | | | |
| 34- NOTINLF | Proportion of persons aged 15 years and over who are not in the labour force | Estimates of this variable have low sampling errors (ABS 1997c) | These variables suffer from the problems arising from benchmarking Indigenous counts to 1991 Census. |
| 35- NOTINLFJ | Proportion of persons aged 15 years and over who are not in the labour force but wanted a job (Discouraged Workers) | Estimates of this variable have high sampling errors (ABS 1997d) | as above |

**Table 2** QUALITY OF SELECTED NATSIS VARIABLES

| Variable[a] | Description | Sampling error-related data quality assessment | Non-sampling data quality issues |
|---|---|---|---|
| 36 – UNEMPLYD | Proportion of persons aged 15 years and over who are unemployed | Estimates of this variable have low sampling errors (ABS 1997c). | as above |
| 37 – PARTEMP | Proportion of employed persons who worked less than 35 hours/week | - | as above |
| 38 – ECDEP | Proportion of persons aged 15 years and over whose main source of income is CDEP | Estimates of this variable have high sampling errors (ABS 1997c). | as above |
| 39 – NOEMP | Proportion of households in which no one was working/ employed | Estimates of this variable have low sampling errors (ABS 1997c). | as above |
| 40 – LTUENMP | Proportion of the unemployed 15 years and over who reported that the length of time that they had been unemployed was 12 months or more. | Estimates of this variable have low sampling errors (ABS 1997c). | as above |
| **Housing** | | | |

**Table 2**  QUALITY OF SELECTED NATSIS VARIABLES

| Variable[a] | Description | Sampling error-related data quality assessment | Non-sampling data quality issues |
| --- | --- | --- | --- |
| 53- AVEPHH | Average number of persons per Household | Estimates of this variable have low sampling errors<br><br>(ABS 1997c) | These variables suffer from the problems arising from benchmarking Indigenous counts to 1991 Census. |
| 54- AVEPBR | Average number of persons per Bedroom | Estimates of this variable have low sampling errors<br><br>(ABS 1997c) | as above |
| 55- NATRENT | Proportion of households who are renting | Estimates of this variable have low sampling errors<br><br>(ABS 1997c) | as above |
| 56 – UNSATD | Proportion of households who are not satisfied with current dwelling | Estimates of this variable have low sampling errors<br><br>(ABS 1997c) | as above |
| 57 – HLIV | Proportion of unsatisfied households who reported that the main problem with dwelling is 'not enough living area' | Estimates of this variable have low sampling errors<br><br>(ABS 1997c) | as above |
| 58 – HBED | Proportion of unsatisfied households who reported that the main problem with dwelling is 'not enough bedrooms' | Estimates of this variable have low sampling errors<br><br>(ABS 1997c) | as above |

**Table 2**   QUALITY OF SELECTED NATSIS VARIABLES

| Variable[a] | Description | Sampling error-related data quality assessment | Non-sampling data quality issues |
|---|---|---|---|
| 59 – HREPAIR | Proportion of unsatisfied households who reported that the main problem with dwelling is 'it needs repair' | Estimates of this variable have low sampling errors (ABS 1997c) | as above |
| 60 – HINSUL | Proportion of unsatisfied households who reported that the main problem with dwelling is 'it needs better insulation/ventilation' | Estimates of this variable have low sampling errors (ABS 1997c) | as above |
| 61 – HBATH | Proportion of unsatisfied households who reported that the main problem with dwelling is 'inadequate bathing facilities' | Estimates of this variable have low sampling errors (ABS 1997c) | as above |
| **Health** | | | |
| 100 – ILL | Proportion of persons who experienced long-term illness (6 months or over) | | Attitudinal data very difficult to validate (Dean Carson 1999, ABS unpublished). |
| 101 – ALCO | Proportion of persons aged 13 years and over who perceived alcohol to be main local health problem | Estimates of this variable have low sampling errors (ABS 1997c) | Attitudinal data very difficult to validate (Dean Carson 1999, ABS unpublished). |

**Table 2**     QUALITY OF SELECTED NATSIS VARIABLES

| Variable[a] | Description | Sampling error-related data quality assessment | Non-sampling data quality issues |
|---|---|---|---|
| 102 – HDRUG | Proportion of persons aged 13 years and over who perceived drugs/substances to be main local problem | | Attitudinal data very difficult to validate. |
| 103 – SMOKE | Proportion of persons aged 13 years and over who are smokers | Estimates of this variable have low sampling errors (ABS 1997c) | Attitudinal data very difficult to validate. |
| 104 – HPOOR | Proportions of persons who self-assessed their health as 'poor' | Estimates of this variable have high sampling errors | Attitudinal data very difficult to validate. It is not possible to determine what respondents meant by poor health.  Meaning varies between respondents. |
| 105 – HSERVICE | Proportion of persons aged 13 years and over who are 'not happy with local health services' | | Attitudinal data very difficult to validate. This information does not necessarily correlate with adequacy, effectiveness or appropriateness of services.  For example it may relate to lack of Indigenous people in delivery of services (Dean Carson 1999, ABS unpublished). |
| 106 – DISTAS | Proportion of Yr10 students who had to travel 'more than 25 kilometres' to attend school | | |

**Table 2**   QUALITY OF SELECTED NATSIS VARIABLES

| Variable[a] | Description | Sampling error-related data quality assessment | Non-sampling data quality issues |
|---|---|---|---|
| 107 – DISTAH | Proportion of households who had to travel 'more than 10 kilometres' to attend the nearest health centre | | Attitudinal data very difficult to validate (Dean Carson 1999, ABS unpublished). |
| 108 – WEIGHTH | Proportion of persons aged 18 years and over (who have their weight and height measurements taken) who were either underweight, overweight or obese. | Estimates of this variable have low sampling errors (ABS 1997c) | The highest non-response rate related to the questions about height and weight - (18% overall, but range from 8% for those aged 5 to 14 years to 35% for those aged 55 years and over). |
| 109 – DISAB | Proportion of persons aged 15 years and over who received disability support allowance | Estimates of this variable have low sampling errors (ABS 1997c) | - |

**Access to infrastructure/services**

| | | | |
|---|---|---|---|
| 65 – HWATER | Proportion of households with no running water connected | Estimates of this variable have low sampling errors (ABS 1997d) | - |

**Table 2**  QUALITY OF SELECTED NATSIS VARIABLES

| Variable[a] | Description | Sampling error -related data quality assessment | Non-sampling data quality issues |
|---|---|---|---|
| 66 – ELECTR | Proportion of households with no electricity connected | Estimates of this variable have low sampling errors (ABS 1997d) | - |
| 67 – NOGARB | Proportion of households that don't have garbage collection | Estimates of this variable have low sampling errors (ABS, 1997c) | - |
| 68 – UNSEALR | Proportion of households whose dwelling is situated in unsealed road | Estimates of this variable have low sampling errors,  except for Warburton (ABS 1997d) | - |

(a)    The numbers in the first column relate to the variable number in Appendix 2.

### 3.3  *Community Housing and Infrastructure Needs Survey (CHINS)*

112.    The 1999 Community Housing and Infrastructure Needs Survey (CHINS) collected housing and management information from Aboriginal and Torres Strait Islander housing organisations and a range of community infrastructure information for those locations identified as discrete communities.

113.    A discrete community is represented as a geographic location, bounded by physical or cadastral (legal) boundaries, and inhabited or intended to be inhabited predominantly by Indigenous people, with housing or infrastructure that is either owned or managed on a community basis.

114.    Table 3 shows that a total of 1,291 discrete Indigenous communities were enumerated in CHINS.    These communities reported a total dwelling stock of 16,159[1] dwellings and a total population of 109,994 (ABS 2000a).

115.    The 1291 discrete communities are located in 273 different Indigenous Areas, out of a possible 692 Indigenous Areas.    Consequently, there is no data for the remaining 419 Indigenous Areas.

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[1] The dwelling stock figure originally published in the publication ABS 2000a, has been revised to 16,159.

**Table 3:**     COMPARISON OF GEOGRAPHIC COVERAGE: CENSUS AND CHINS

| | | | Number of IAREs covered in: | | |
|---|---|---|---|---|---|
| ATSIC Region | | Number of discrete communities covered in CHINS | CHINS | CENSUS | CHINS / CENSUS |
| 1 | Queanbeyan | 4 | 3 | 16 | 18.8% |
| 2 | Bourke | 15 | 10 | 15 | 66.7% |
| 3 | Coffs Harbour | 22 | 15 | 39 | 38.5% |
| 4 | Sydney | 3 | 3 | 67 | 4.5% |
| 5 | Tamworth | 9 | 8 | 20 | 40.0% |
| 6 | Wagga Wagga | 14 | 12 | 35 | 34.3% |
| 7 | Wangaratta | 1 | 1 | 26 | 3.8% |
| 8 | Ballarat | 1 | 1 | 24 | 4.2% |
| 9 | Brisbane | 1 | 1 | 31 | 3.2% |
| 10 | Cairns | 6 | 3 | 23 | 13.0% |
| 11 | Mount Isa | 37 | 5 | 9 | 55.6% |
| 12 | Cooktown | 83 | 14 | 14 | 100.0% |
| 13 | Rockhampton | 1 | 1 | 20 | 5.0% |
| 14 | Roma | 1 | 1 | 19 | 5.3% |
| 15 | Torres Strait Area | 18 | 18 | 20 | 90.0% |
| 16 | Townsville | 2 | 2 | 17 | 11.8% |
| 17 | Adelaide | 6 | 4 | 22 | 18.2% |
| 18 | Ceduna | 13 | 3 | 4 | 75.0% |
| 19 | Port Augusta | 87 | 8 | 12 | 66.7% |
| 20 | Perth | 3 | 1 | 29 | 3.4% |
| 21 | Broome | 67 | 6 | 6 | 100.0% |
| 22 | Kununurra | 87 | 12 | 14 | 85.7% |
| 23 | Warburton | 28 | 11 | 14 | 78.6% |
| 24 | Narrogin | 2 | 2 | 22 | 9.1% |
| 25 | South Hedland | 33 | 8 | 11 | 72.7% |
| 26 | Derby | 43 | 10 | 11 | 90.9% |
| 27 | Kalgoorlie | 10 | 7 | 9 | 77.8% |
| 28 | Geraldton | 12 | 7 | 13 | 53.8% |
| 29 | Hobart | 1 | 1 | 16 | 6.3% |
| 30 | Alice Springs | 48 | 6 | 7 | 85.7% |
| 31 | Jabiru | 141 | 13 | 14 | 92.9% |
| 32 | Katherine | 113 | 19 | 23 | 82.6% |
| 33 | Aputula | 185 | 25 | 25 | 100.0% |
| 34 | Nhulunbuy | 124 | 16 | 16 | 100.0% |
| 35 | Tennant Creek | 53 | 10 | 11 | 90.9% |
| 36 | Darwin | 17 | 6 | 18 | 33.3% |
| TOTAL | | 1291 | 273 | 692 | |

116.     Only 15 ATSIC regions had more than 70 percent of their discrete communities covered by CHINS.  Hence a complete mapping between Census and CHINS is not possible. Based on Table 3, the following ATSIC Regions' Indigenous areas are very well represented by CHINS:

| ATSIC Region | ATSIC Region Name |
|:---:|:---:|
| 12 | Cooktown |
| 15 | Torres Strait Area |
| 18 | Ceduna |
| 21 | Broome |
| 22 | Kununurra |
| 23 | Warburton |
| 25 | South Headland |
| 26 | Derby |
| 27 | Kalgoorlie |
| 30 | Alice Springs |
| 31 | Jabiru |
| 32 | Katherine |
| 33 | Aputula |
| 34 | Nhulunbuy |
| 35 | Tennant Creek |

117.    Nine of these 15 regions were from the most disadvantaged quartile according to the Stage 1 index (ABS 2000b). The limited geographic and Indigenous population coverage of discrete communities has restricted the use of these data to sensitivity analysis.

118.    *A sensitivity analysis using CHINS.* While CHINS was not used to enhance Census data, it was used in one sensitivity analysis to check whether the ranking of the 15 ATSIC regions (adequately covered by CHINS) would be affected by the introduction of CHINS data. A data set from Census and CHINS was created for these 15 ATSIC regions. The assumption used for the sensitivity analysis is that the Indigenous Areas assume the characteristics of the discrete communities within them. Table 4 shows the variables from CHINS which were added to the set of variables from Census.

119.    For the 15 regions adequately covered by CHINS, a PCA was run using data from Census and data from CHINS. The scores from this analysis were then used to rank the regions from 1 to 15. Results suggest that the rankings of these 15 regions based on the Census variables did not vary much from the rankings when Census is augmented with CHINS variables.

**Table 4**      CHINS VARIABLES ADDED TO CENSUS DATA IN THE
               SENSITIVITY ANALYSIS

| DWATER | Dwelling | % of Permanent Dwellings in Discrete Communities not connected to Water Supply |
|---|---|---|
| DELECT | Dwelling | % of Permanent Dwellings in Discrete Communities not connected to Electricity Supply |
| SEWERSEP | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is septic tanks |
| SEWERPIT | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is pit toilets |
| SEWERPAN | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is pan toilets |
| SEWEROTH | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is 'other type disposal system' |
| SEWERNO | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is 'no disposal system' |
| SEWEROFL | Dwelling | %. of Permanent Dwellings in Discrete Communities affected by overflows in last 12 months |
| DRAINPON | Dwelling | % of Permanent Dwellings in Discrete Communities affected by ponding in last 12 months |
| TRANSUNS | Dwelling | % of Permanent Dwellings in Discrete Communities on unsealed roads |
| WATER | Communities | % of Discrete Communities where Main Source of Drinking Water: No Organised Supply (7) |
| ELECT | Communities | % of Discrete Communities where Main Source of Electricity Supply: No Electricity (7) |
| SEWER | Communities | % of Discrete Communities where Main Sewerage System: No Sewerage System |

| RUBBISH | Communities | % of Discrete Communities where Rubbish collection: No Organised Collection (2) |
|---|---|---|
| DISPRIM | Communities | % of Discrete Communities where Distance to nearest primary school: Greater than 50km |
| DISYR10 | Communities | % of Discrete Communities where Distance to nearest secondary school Yr10: Greater than 50km |
| DISYR12 | Communities | % of Discrete Communities where Distance to Nearest secondary school Yr12: Greater than 50km |
| DISFAID | Communities | % of Discrete Communities where Distance to nearest first aid clinic: Greater than 50km |
| DISHOSP | Communities | % of Discrete Communities where Distance of nearest hospital Greater than 50km |
| DISCENT | Communities | % of Discrete Communities where Distance of nearest health centre Greater than 50km |
| DISCHEM | Communities | % of Discrete Communities where Distance of nearest chemist Greater than 50km |
| FWORKER | Communities | % of Discrete Communities where Frequency of access to a Female Indigenous Health Worker: Less than three monthly |
| MWOKER | Communities | % of Discrete Communities where Frequency of access to a Male Indigenous Health Worker: Less than three monthly |
| PWATER | Individual | % of Persons in AREG Discrete Communities where Main Source of Drinking Water: No Organised Supply (7) |
| PELECT | Individual | % of Persons in AREG Discrete Communities where Main Source of Electricity Supply: No Electricity (7) |
| PSEWER | Individual | % of Persons in AREG Discrete Communities where Main Sewerage System: No Sewerage System |
| PRUBBISH | Individual | % of Persons in AREG Discrete Communities where Rubbish Collection: No Organised Collection (2) |

| PDISPRIM | Individual | % of Persons in AREG Discrete Communities where Distance to nearest primary school: Greater than 50km |
|----------|------------|--------------------------------------------------------------------------------------------------------|
| PDISYR10 | Individual | % of Persons in AREG Discrete Communities where Distance to nearest secondary school Yr10: Greater than 50km |
| PDISYR12 | Individual | % of Persons in AREG Discrete Communities where Distance to nearest secondary school Yr12: Greater than 50km |
| PDISFAID | Individual | % of Persons in AREG Discrete Communities where distance to nearest first aid clinic: Greater than 50km |

## 3.4 National Perinatal Data

120. The National Perinatal Data (see Day, Sullivan, and Lancaster 1999) reports ATSIC Region information on births to Indigenous mothers in 1991-1996. The data is based on identifiable mothers' place of usual residence.

121. In the collection, an Indigenous person is defined as a 'person of Aboriginal or Torres Strait Islander descent who identifies as an Aboriginal or Torres Strait Islander descent and is accepted as such by the community with which he or she lives'. The term Indigenous is used to refer to mothers of Aboriginal or Torres Strait Islander descent and their babies. Information on babies born to Indigenous fathers and non-Indigenous mothers is not included.

122. Like other Indigenous datasets this is also subject to data quality problems. Data recorded in the perinatal data collections may vary from State and Territory registrations, in which the Indigenous status of both parents is included. The number of Indigenous live births registered in each State and Territory may differ substantially from the number recorded in the perinatal data collection (where only the mother's Indigenous status is recorded).

123. The main explanation for the possible discrepancy in birth numbers is that in the registries Indigenous births include both births to Indigenous mothers and to non-Indigenous mothers whose partners are Indigenous. Other possible explanations for the differences are the failure to ask patients' Indigenous status at the data recording stage in the perinatal collections, and miscoding if Indigenous status is based on clerical staff's perceptions.

## 3.5 Hospital separations data

124. Appendix 6 provides a discussion of the limitations of the hospital data for index construction purposes. While the hospital records may provide, in certain areas like the Northern Territory, an acceptable representation of the differences in health status, its use in the construction of an index that compares regions across all Australia, may be difficult for the reasons explained in Appendix 6 and which are summarised here.

125. ***Separation statistics do not measure prevalence of disease.*** The numbers represent episodes of hospitalisation rather than people. An individual may have been admitted to hospital on more than one occasion during 1997-98, and each separate hospital admission would be included in the data.

126. ***Separation statistics do not provide a meaningful measure of health disadvantage.*** Each hospital admission represents a mixture of need, access, and demand. Low rates of hospitalisation may represent lower level of need (ie a healthier population), or they may mean existing needs are not being met (e.g. sick population with poor access). Conversely, a rising rate of hospitalisation could mean either a worsening of health status or an improvement in access.

127. ***Separation statistics are influenced by hospital admission policy not correlated with health disadvantage.*** Hospital admission policies vary from hospital to hospital and State to State, as does the availability of *outpatient* care services. A person with a particular condition may be admitted to hospital in one area but treated as a day patient or outpatient or at a doctor's surgery in another area.

128. ***The quality of separation statistics is reduced by incomplete Indigenous identification.*** There is a lack of complete identification of Indigenous people in hospital records. This results in an underestimate of hospitalisation of Indigenous people. For index construction purposes, this may not be a major concern if the degree of underestimation is uniform or consistent across the 36 ATSIC regions. But this may not be the case. Indigenous identification is not done in the same manner across hospitals. Thus the extent of underestimation may vary significantly from ATSIC region to ATSIC region, and perhaps from disease to disease, as well as over time.

129. ***The varying methods of collecting information on Indigenous identification can lead to data quality issues.*** Hospitals throughout Australia collect information on the Indigenous status of admitted patients, but the question used to determine the information differs from place to place. The method of determining the response also varies, from directly asking a question of all patients, to asking only some patients, to determining the answer based on the patient's appearance. With the increased use of computer-based records and paperless systems, a number of hospitals do not actually have a specified question, because they do not have a patient questionnaire. Rather, information is entered directly onto the computer. Instead of a specific question, a heading (such as 'Indigenous status') appears on the computer screen, followed by a series of options (such as 'Aboriginal', 'Torres Strait Islander', 'Both Aboriginal and Torres Strait Islander', 'Neither'). Although such a system has many potential benefits (such as reduced transcription errors and increased efficiency), it does make it difficult to determine the approach used to assess the Indigenous status of patients (ABS 2000).

### 3. 6  Implications of overall data quality

130. Sections 3.1 to 3.5 have raised a number of data quality issues affecting Indigenous collections. This section concludes the assessment by discussing how each of the data flaws could affect the PCA-analysis and the results.

131. ***Data with fatal quality problems has been excluded from the index.*** The most serious concerns relate to data that would be deemed inappropriate for the type of analysis undertaken here. These include:

(i)   variables with large sampling errors;

(ii)   variables which suffer from imbalance in coverage of the Indigenous population;  and

(iii)   variables which do not capture the essential aspects of the Indigenous population.

132.   This study has excluded variables which contain large sampling errors.  While variables that suffer from sampling errors are listed in Appendix 2, they have not been used in the construction of the indexes and do not affect the results reported.  For example, the NATSIS self-assessed health variables are affected by large sampling errors and have thus been excluded from the indexes.

133.   Similarly eight of the 692 Indigenous Areas which have particular problems of data quality in the Census have been excluded from this analysis, leaving 684 Indigenous Areas to rank.

134.   ***Inadequate geographical coverage.***   Geographic coverage is a problem for some data sets.  The CHINS data is particularly rich with information on access to services, however, the focus on discrete communities limits the geographic coverage of Indigenous Areas and ATSIC regions.  This study has not included CHINS data in the construction of indexes because of its limited coverage.

135.   ***Under-enumeration and identification of Indigenous people.***   If this problem affected all regions uniformly, it would not introduce systematic biases into the analysis. In reality certain regions may be under-enumerated more than others.   Use of population proportions in the analyses reported here reduces the impact of this problem.

136.   ***Data staleness.***   At the time of the analysis reported here, the 1996 Census data is four years out-of-date.   However, the relative socioeconomic disadvantage of an area is unlikely to change rapidly.  Thus it is unlikely that over the last four years significant changes have taken place that would drastically change the relative ranking.  In particular, the most disadvantaged Indigenous Areas in 1996 are likely to have remained disadvantaged.

137.   ***Census non-responses.***   Although non-response to individual Census items is quite low overall, it does vary between areas, and may be high for some groups of Indigenous people.   If item non-response rates were correlated with socioeconomic disadvantage, this could disturb the ranking of Indigenous areas.

138.   ***Place of enumeration versus place of residence.***   The Census tables on social and economic aspects of the population are based on people's place of enumeration (where they were spending the night at the time of the Census) and not their usual residence.  This could disturb the ranking of Indigenous areas if place of enumeration and place of usual residence are in different Indigenous areas.

139.   There are also difficulties in attempting to capture dimensions such as family structure which are unique to the Indigenous population.  This is particularly relevant to some of the Census variables that deal with family dynamics.  This has been addressed in the creation of equivalence scales, which attempts to adjust family and household income for size and composition.  The ranking of ATSIC regions has been robust with these changes.

140.    Overall, the results on the general index based on ABS 1996 Census only and the index based on ABS 1996 Census, NATSIS and national perinatal data are very robust. Since these rankings are based on a variety of datasets, some of which are subject to concerns about data quality, the results are indicative only.

141.    For this reason, the regions have been grouped into quartiles (each covering 9 regions) with the following labels indicating relative disadvantage within the Indigenous population: 'Least disadvantaged', 'Less disadvantaged', 'More disadvantaged' and 'Most disadvantaged'.  Within each quartile the ranking of regions does change.  However, results are very robust between quartiles — that is regions rarely move between quartiles under varying assumptions.

# 4. METHODOLOGY

## *4.1 Geographical area for analysis*

142.     The construction of the disadvantage index was done at two geographical levels: Indigenous Area and ATSIC Region.  These levels, together with the CD and Indigenous Location (ILOC), form part of the Australian Indigenous Geographical Classification (AIGC) a system that was designed specifically for use with the 1996 Census Indigenous data.  The classification covers the whole of Australia and was designed from the perspective of geographic regions appropriate to Indigenous people.  The classification is hierarchical in nature.

143.     Only Census data were able to be analysed at the Indigenous Area (IARE) level. The rest of the analyses reported in this paper were conducted at the ATSIC Region (AREG) level, owing to issues of sample size and data quality.

## *4.2 Index construction technique: Principal Component Analysis*

144.     The disadvantage variables are summarised into one indicator using a multivariate technique called Principal Component Analysis (PCA).  PCA is a tool used to reduce a large number of related variables to a new set of (uncorrelated) components.  The first principal component is the linear combination of the variables that explains the highest possible variance in the data set.  This study uses the first principal component to represent Indigenous disadvantage.

145.     PCA was applied in 4 different ways:

(i) PCA was used to derive a single index that shows relative disadvantage between 684 Indigenous Areas and 36 ATSIC Regions using 1996 Census only.

(ii) PCA was used to derive a single index that shows relative disadvantage between ATSIC Regions.  In this analysis 1996 Census was enhanced by data from other sources.  The disadvantage index was constructed by running PCA on 36 observations (each observation corresponding to an ATSIC Region).  These 36 regions were ranked in order of socioeconomic disadvantage.

(iii) PCA was used to derive two indexes that separately ranked relative disadvantage at the ATSIC Region level.  The variables were classified as either related to economic or habitat disadvantage.

(iv) PCA was then conducted within each grouping to derive four indexes with separate rankings at the ATSIC Region level.  The variables were delineated between the four functional areas:

- housing and infrastructure,

- employment and income,

- education, and

- health.

146.    The steps in performing PCA can be summarised as follows:

(i)  Step 1 - identify the variables likely to affect disadvantage significantly;

(ii)  Step 2 - develop rules governing the exclusion or inclusion of variables;

(iii)  Step 3 - construct a correlation matrix of the variables in step 1;

(iv)  Step 4 - summarise the data on Indigenous population;

(v)  Step 5 - estimate eigenvectors;

(vi)  Step 6 - construct an initial disadvantage index using the first principal component;

(vii)  Step 7 - establish how each variable in step 1 varies with the index and delete any that do not satisfy the inclusion rules;

(viii)  Step 8 - construct a final disadvantage index;

(ix)  Step 9 - scale the index;

(x)  Step 10 - validate the index.

147.    Each one of these steps is described briefly.  (Appendix 3 shows selected outputs from the application of PCA).

148.    ***Step 1 - identify the variables likely to affect disadvantage significantly.***  The outcomes of this step are summarised in Appendix 2.  These variables were selected from ABS (1998a - Census, NATSIS, national perinatal data and CHINS) as guided by Indigenous statistics experts.

If $D_1$ stands for disadvantage score then

$$D_1 = f(X_1 , X_2 , .... X_n) \qquad (1)$$

where $X_i$ are different variables listed in Appendix 2 and hypothesised to influence disadvantage.

149.    All the variables used in the analysis were expressed as ratios or percentages (eg as a percentage of persons aged 15 years or more) to make the measurements comparable between AREGs.  In constructing the functional area indexes, the ABS consulted with experts to classify the variables into their respective groupings.  Certain variables are difficult to classify and may not be mutually exclusive.  In this case we have performed sensitivity testing to analyse the variability of results depending on the selected classification of variables.

150.    ***Step 2 - develop rules governing the exclusion or inclusion of variables.***  The disadvantage function in (1) is assumed to have the following properties:

f() is assumed to be linear;

151.    For a variable $X_i$ to be admissible, its values when increased must lead to an increase in the value of the disadvantage index.  This property is used in Step 7 to exclude variables which are negatively related to the disadvantage index.

152.    ***Step 3 - construct a correlation matrix of the variables in step 1.***  A correlation matrix is a square matrix showing the correlation coefficients between each pair of variables.  A correlation coefficient is a measure of the linear association between two variables (and could be positive or negative).   If two variables are independent of one another then the correlation coefficient is zero.  This matrix is used in the next two steps to summarise the information on the Indigenous population presented in Appendix 2.

153.    The correlation matrix was examined to ensure that particular socioeconomic disadvantage aspects are not over-represented in the analysis.  This would lead to an index that assigns an unreasonably high weight to this aspect.   An extreme example would be the inclusion of the same variable twice in the analysis.  To avoid such over-representation, the correlations of the initial input variables were examined.  If any two of the variables relate to the same disadvantage dimension and had a very high correlation, only one of the pair was retained for the analysis.

154.    ***Step 4 - summarise the data on Indigenous population.***  The method used to summarise the data is PCA.  The central idea of PCA is to reduce the dimensionality of a data set in which there are a large number of inter-related variables, while retaining as much as possible of the variation present in the original data set.  The aim of this project is to find a way to replace the variables in the original set with a disadvantage score computed in such a way that retains information about the essential aspects of disadvantage.  The data is summarised taking into account the correlation matrix in step 3.

155.    ***Step 5 - estimate the eigenvectors.***  This step uses the values of coefficients $(a_{11}, a_{12}, a_{13},...,a_{1n})$ relating to the first eigenvector to construct the measure of disadvantage $D_1$:

$$D_1 = a_{11} X_1 + a_{12} X_2 + a_{13} X_3 + ... + a_{1n} X_n; \qquad (2)$$

$X_1, X_2,..., X_n$ are the variables identified in Appendix 2;

$(a_{11}, a_{12}, a_{13},...,a_{1n})$ is the first eigenvector; and

$a_{1n}$ is a component weight for the nth variable in the measure of disadvantage $D_1$.

156.    The relationship in (2) only describes the first principal component.  The PCA technique computes other principal components, that is other linear relationships as in (2).  However, the second and later principal components each capture less of the information in the original dataset than does the first principal component.   In the study the first principal component is used to measure disadvantage.

157.     ***Step 6 - construct an initial disadvantage index using the first PCA.***  Using the relationship (2) above, a score can be calculated for each geographical area.

158.     ***Step 7 - establish how each disadvantage variable in Step 1 varies with the index.***  This step is necessary to check that each variable included in the disadvantage index actually contributes to disadvantage.  If it does not (for example as the variable increases, disadvantage decreases or does not change significantly) then that variable is excluded from the list of variables which define disadvantage.  The process is then repeated from Step 3.

159.     Variables which correlate poorly with the overall index do little but add to the variability of the index.  These variables are not related to the thrust of the index, and can make the index unnecessarily sensitive to small changes in the population over time.

160.     In addition, many of the variables are represented in both the Census and NATSIS datasets.  Where we have variables that represent the same concept and provide similar statistical results, we have taken the Census variable in preference.

161.     ***Step 8 - construct a final disadvantage index.***  This is the same as Step 6, now using the reduced final set of variables.

162.     ***Step 9 - scale the index.***  To allow for easy recognition of high and low scores, the index scores have been standardised to have a mean of 1000 and a standard deviation of 100.  Index values with scores higher than 1000 represents areas that are more disadvantaged.  Scores lower than 1000 correspond to areas that are less disadvantaged.

163.     ***Step 10 - validate the index.***   The derivation of any disadvantage index necessarily involves a mix of statistical techniques and a measure of subjectivity.  Socioeconomic disadvantage is a complex concept especially in the case of the Indigenous population.  It was important to scrutinise the experimental index carefully, to ensure that it provided a valid measure of disadvantage relevant to Indigenous people.

164.     The first principal component was examined to see if it was summarising the input variables adequately.  The principal component in the single index explains about half (at AREG level) of the variability in the underlying input variables.  This is a good indication that some common underlying factor was identified and summarised.  The index was graphed against a number of variables not included in the study but which are deemed to represent disadvantage.  The index performs well against most of these.

165.     The index is also confronted with local knowledge of Indigenous Areas.  The relative rankings of different areas should be in accord with local knowledge.  While there may be disagreements about the exact placement of other areas there is likely to be more consensus about the ranking of the most disadvantaged and least disadvantaged areas.

### 4.3   An equivalence scale for adjusting income

166.     An equivalence scale was used to adjust family and household income for size and composition.  An equivalence scale measures the relative incomes needed by different types of families or households to attain the same material standard of living.  An equivalised income was used for calculating the proportion of households falling below the poverty line.

167. The OECD equivalence scales were used. The scales accommodate differences only in the number of adults and children in a family or household. The scaling system carries a weight of 1.0 for the first adult in the unit, 0.7 for a second adult, and 0.5 for each child.

168. With these equivalence scales it is possible to compare (for example) a family with two adults and two children with a family with two adults and four children. A family with two adults and two children has a scaling score of 2.7 while a family with two adults and four children has a scaling score of 3.7. Thus the family with two adults and four children would require 1.37 times the income of the two-adult-two-children family.

169. The study computed three low income (or poverty) indicators to be used in constructing the disadvantage index. These were:

(i) the proportion of families whose equivalised family incomes are below a certain poverty line;

(ii) the proportion of households whose equivalised household incomes are below a certain poverty line; and

(iii) the proportion of Indigenous children whose family incomes are below the poverty line, where children refers to persons under 15, plus dependent students aged 15-24 and non-dependent children.

170. In this paper, poverty is calculated using the 'head count' approach. This approach estimates the number of persons living in families/ households whose incomes fall below the poverty line. The poverty line used is set at half of the median equivalent family (or household) income of all Indigenous Australians. Using this poverty line means that one is comparing the living standards of the Indigenous people with the living standards of other Indigenous peoples only, not with the living standards of mainstream Australia. This is in keeping with the objective of the Indigenous Funding Inquiry (ie to compare groups within the Indigenous population only).

## 4.4 Investigating hospital separations administrative data

171. Hospitalisation rates for various diseases were computed by ATSIC region. These rates were age-standardised because of differences in population composition with respect to age between the ATSIC regions.

172. The study used *direct* standardisation. In direct standardisation, a standard population is selected and employed in deriving the age-adjusted morbidity rates (ie 36 rates, by ATSIC region). If the same standard population is employed, as required, all the 36 rates are directly comparable. The formula calls for computing the weighted average of the age-specific morbidity rates in a given ATSIC region, using as weights the age distribution of the standard population. The formula for an ATSIC Region's morbidity rate, using direct standardisation, is given by:

$$m_{\text{diagnosis, ATSIC,sex}} = \Sigma \{m_{\text{ATSIC}} \ SP_{\text{age}}/SP_{\text{total}}\} \ x \ 1,000$$

where $\quad m_{\text{ATSIC}} = ( \text{Separations}_{\text{diagnosis, age,sex}} /P_{\text{age, sex}} ) = $ age-specific hospital separation rate for a particular diagnosis in the specified ATSIC region;

$SP_{\text{age}}$ represents the standard population at each age group;

$SP_{\text{total}}$ represents the total standard population; and

$P_{\text{age,sex}}$ represents an area's population at each age group, by sex (data is for 30 June 1996).

173.    Each age-specific hospital separation rate is multiplied, in effect, by the proportion of the standard population in each age group.

174.    The standard population used is the estimated resident Indigenous population as of 30 June 1996 (ABS 1998e).

## 5.  RESULTS: INDIGENOUS SOCIOECONOMIC DISADVANTAGE INDEXES

175.    The primary output from this study is a ranking of Indigenous geographical units in order of socioeconomic disadvantage.  The ranking is based on indexes constructed using Principal Component Analysis.  The paper presents 9 indexes:

   (i)  a general index based on data from the 1996 Census;

   (ii)  a decomposition of the index in (i), by accessible, moderately accessible and remote areas;

   (iii)  a general index based on melded Census, 1994 NATSIS and national perinatal data;

*Indexes specific to economic and habitat aspects of disadvantage* —

   (iv)  an economic index — a disaggregated index that captures disadvantage related to employment, income, and education;

   (v)  a habitat index— a disaggregated index that captures disadvantage related to housing, infrastructure and health;

*Indexes specific to functional areas* —

   (vi)  an education index — the index in (iv) minus the employment and income variables;

   (vii)  an employment and income index— the index in (iv) minus the education variables;

   (viii)  a housing and infrastructure index;  and

   (ix)  a health index based on NATSIS and perinatal statistics. (An alternative health index, based on hospital utilisation, was also derived using data from the 1997-98 National Hospital Morbidity Database).

176.    The first two indexes are based on the variables derived from the 1996 Census only.  The third index was obtained when 1996 Census data was augmented with variables from the NATSIS and national perinatal data sets.  The combined data set contains 119 variables, of which 34 variables contribute to the final general index of disadvantage.  The rest of the indexes attempt to disaggregate disadvantage by functional areas.

177.    ***The level of geography.***  The lowest common level of geography shared by the various data sets is 'ATSIC Region'.  Although Census data was available at Indigenous Area level, this could not be used with data from the other data sets as the lowest level of geography available for both NATSIS and national perinatal data is the ATSIC Region.  The results using additional datasets are reported at ATSIC Region level (36 components).

178.    *A reference index.*  The index based only on the Census variables is used as a reference index.  The results from all the other analyses are compared with this reference index.


## 5.1  Experimental general index:  ABS 1996 Census (refined)

### 5.1.1  Analysis at the Indigenous Area level

179.    This sub-section reports a set of results where the unit of analysis is the Indigenous Area.  From this analysis it is possible to determine the disadvantage ranking of the 684 Indigenous Areas.  It is also possible to rank Indigenous Areas within the same ATSIC Region and generate index scores for the ATSIC Regions by weighting up the Indigenous Areas' scores.

180.    The estimates of eigenvectors coming from a PCA of the 684 Indigenous Areas are shown in Table 5.  In Table 5, the first column shows the functional area and the variables that are significant determinants of disadvantage at the Indigenous area level.  The second column gives a description of these variables.  Estimates of the eigenvectors are shown in the last four columns.  The variables that are relevant for defining disadvantage are those which have corresponding weights in the last four columns of Table 5.

181.    In the third column, estimates of eigenvectors (factor loadings) are displayed when all Indigenous areas are included in the analysis.  The variables that are associated with Indigenous disadvantage are the same as in earlier analyses.

182.    The following refinements have been implemented as a result of peer review of an earlier version of the Census only index:

  (i) In an earlier version of the Census only index the Census variable FINCLO (percentage of families whose income < $15,600) measuring the rate of poverty in Indigenous areas was significant.  Peer reviewers indicated that the Census definition of family may not adequately represent the complexities of Indigenous families.  In Table 5 this variable has been replaced by the variable POVERHH, representing the poverty rate based on equivalised household income (measured as percentage of persons whose equivalised household income is below poverty line).

  (ii) In an earlier analysis, the variable FEWBED (proportion of occupied private dwellings, including  caravans in parks, with zero or one bedrooms) had been used to measure prevalence of overcrowded accommodation in an area.  This variable is replaced in Table 5 with BEDRATIO (proportion of households with a person/bedroom ratio of 4 or more), a variable which better measures overcrowding.

  (iii) In an earlier study, rental accommodation was represented by two variables   NGRENT (percentage of households renting - private source) and GRENT (percentage of households renting   govt source).  In Table 5 rental accommodation is combined into one variable CENSRENT (proportion of households renting    all types).

183.   The results from these refinements of the index at the Indigenous Area level leads to a new set of estimates for the eigenvectors of the first principal component.  From this analysis it is possible to determine the disadvantage ranking of 684 Indigenous Areas.

184.   The variables that are relevant for defining disadvantage at the Indigenous Area level are those which have corresponding weights in Table 5.  The disadvantage index at the Indigenous area level has been constructed with the variables identified by PCA to have a positive and significant association with disadvantage.

185.   The index is composed of indicators that measure educational attainment (no post school qualification, no schooling, inadequate fluency in English), low income, labour and employment indicators (employment in low-paying occupation, employment as a CDEP participant, not in the labour force), poor or crowded housing (overcrowding in dwelling, inadequate number of bedrooms, lack of home ownership, family size), and lack of a means for mobility.  These variables exert a fairly equal influence on the index, with the exception of NILF. The Indigenous Area index scores and ranks are shown in Appendix 4.

### 5.1.2  *Indigenous area rankings by accessible, moderately accessible and remote (ARIA)*

186.   In the Indigenous Area level analysis the study investigated whether disadvantage is associated with different socioeconomic variables in the accessible areas as opposed to the  moderately accessible and remote areas.  In this investigation use was made of the Accessibility and Remoteness Index Australia (ARIA) which attempts to measure remoteness in Australia (for details see Australia, Department of Health and Aged Care, 1999). It is designed to be an unambiguously geographical approach to defining remoteness, excluding socioeconomic, and population size factors.  ARIA measures remoteness in terms of access along the road network from populated localities to four categories of service centres.

187.   ARIA uses actual distance travelled by road (rather than straight line distance) from the point locations of General Post Offices in 11,340 populated localities to the GPO of the nearest service centre in each category.  The 201 service centres are ABS defined urban centres with a population of 5,000 or more at the 1996 Census, grouped into four population size categories:

<div style="text-align:center">

(i)  Class A:      250,000 or more

(ii)  Class B:     48,000 to 249,999

(iii)  Class C:    18,000 to 47,999

(iv)  Class D:     5,000 to 17,999

</div>

188.   ARIA calculates a single accessibility/remoteness index number for each populated locality between 0 and 12.  In constructing disadvantage indexes, the ARIA scores for Indigenous Areas were calculated as the average of the Indigenous Areas' constituent CDs.

189.   In interpreting the ARIA scores, the following categories were based on natural breaks in the data:

(i)  Highly accessible areas (ARIA scores of 0 to 1.84): relatively unrestricted accessibility to a wide range of goods and services and opportunities for social interaction.

    (ii) Accessible areas (ARIA scores of 1.84 to 3.51): some restrictions to accessibility of some goods, services and opportunities for social interaction.

    (iii) Moderately accessible areas (ARIA scores of 3.51 to 5.80): significantly restricted accessibility of goods, services and opportunities for social interaction.

    (iv) Remote areas (ARIA scores of 5.80 to 9.08): very restricted accessibility of goods, services and opportunities for social interaction.

    (v) Very remote areas (ARIA scores of 9.08 to 12.0): locationally disadvantaged — very little accessibility of goods, services and opportunities for social interaction.

190.    In constructing separate indexes by Indigenous Area, this study created just three groups, instead of five. These are:

| | |
|---|---|
| (i) Accessible Areas: | Indigenous Areas with ARIA scores of 0 to 3.51. |
| (ii) Moderately Accessible: | Indigenous Areas with ARIA scores of 3.51 to 5.80. |
| (iii) Remote: | Indigenous Areas with ARIA scores of 5.80-12.00. |

191.    ARIA was used to group Indigenous Areas into three categories: accessible, moderately accessible and remote. Principal components analysis was then undertaken separately for each category. The aim of this analysis is to identify if there is a large difference in the drivers of disadvantage between accessible, moderately accessible and remote areas. The last 3 columns of Table 5 show the results from these analyses. The table shows that disadvantage is driven by similar variables, although the importance of each variable differs between accessible, moderately accessible and remote areas. Viewing the three separate results, a main set of core drivers remain constant with minor changes to the variable selection.

**Table 5 Index weighting for All Areas, Accessible Areas, and Remote Areas, based**

| Geographical | All 684 Indigenou Areas | Accessible Indigenou Areas | Moderatel Accessible Indigenou Areas | Remote Indigenou Areas |
|---|---|---|---|---|
| Eigenvalue (first principal | 6.00 | 5.76 | 4.36 | 3.86 |
| Percent of variance | 46% | 38% | 31% | 35% |

| Disadvantag categor | Variable | Eigenvecto | Eigenvecto | Eigenvecto | Eigenvect |
|---|---|---|---|---|---|
| *Educatio* | | | | | |
| NOQUAL | % of persons aged 15 and over post-school | 0.3111 | 0.3227 | 0.326 | 0.2625 |
| SHRTSCH | % of persons aged 15 and over school at age 15 or | ns | 0.2411 | ns | ns |
| NOSCH | % of persons aged 15 and over never went to | 0.2886 | ns | 0.1201 | 0.2799 |
| PRFLUEN | % of persons aged 15 and over English | 0.2797 | ns | 0.1726 | 0.2912 |
| *Family* | | | | | |
| ONEPARDP | % of families which are sole-familie | ns | 0.2314 | 0.223 | ns |
| DEPRATIO | Dependency | ns | 0.1791 | ns | ns |
| *Incom* | | | | | |
| POVHH | % of persons whose household income is below | 0.2805 | 0.2825 | 0.1508 | 0.2865 |
| *Labour* | | | | | |
| M UNEMP | % of males in labour force | ns | 0.3113 | ns | ns |
| F UNEMP | % of females in labour unemploy | ns | 0.2811 | ns | ns |
| UNEMCDEP | CDEP-employed as % of labour | 0.3203 | 0.3553 | 0.309 | 0.3756 |
| NILF | % of working age persons not labour | 0.1144 | 0.3352 | 0.1964 | ns |
| MLABOUR | % males aged 15 years and classified as Labourers and Worker | 0.3203 | 0.2165 | 0.2476 | 0.3315 |
| FLABOUR | % females aged 15 years and classified as Labourers and Worker | 0.277 | 0.1103 | 0.217 | 0.2963 |
| *Housin* | | | | | |
| CENSRENT | % of households renting (al | ns | 0.2579 | 0.2371 | ns |
| MULTFAM | % of occupied dwellings with more | 0.3387 | 0.1809 | 0.4046 | 0.3608 |
| IMPDWELL | % households in improvised | 0.2014 | ns | 0.1127 | 0.1575 |
| BEDRATIO | % of households with a ratio of 3 or | 0.3242 | 0.1480 | 0.3706 | 0.3203 |
| *Accessibility/mobil* | | | | | |
| NOCAR | % occupied private dwellings registered motor | 0.3103 | 0.2771 | 0.4053 | 0.2994 |

ns not

Notes: The eigenvalue Indicates the amount of variance underlying all the variables associated with the princi eigenvalues equals the number of variables. Hence the eigenvalue divided by the number of variables gives t explained by the principal component. The eigenvector shows the factor loadings or weights of the variables

192. The table demonstrates that the variables, identified by PCA as important in describing Indigenous disadvantage, vary by level of accessibility of an area:

(i) A few variables which are highly significant in accessible areas have either lower weights in moderately accessible and remote areas or become insignificant (for example, percentage of persons aged 15 and over with no post-school qualifications).

(ii) Similarly a few variables which are very significant in moderately accessible and remote areas are not as important in the accessible areas (for example, the percentage of Indigenous people working as labourers and related workers).

(iii) While family structure-related variables are important in accessible areas they are not significant when all areas are analysed, neither are they in remote areas.

193. Appendix 5 shows the ranking of the different Indigenous areas in the three geographical groups— 'accessible', ' moderately accessible' and 'Remote'.

194. The results from the rest of this section are presented in three forms.

195. First, a graph is presented comparing the ranking based on the new index with that based on the 1996 Census data only. The aim of this diagram is to assist the user in assessing whether the new index changes the ranking of ATSIC regions. The ranking of ATSIC Regions using an index based on the 1996 Census data only, are given on the horizontal axis in each of the figures. That ranking does not change. It is possible to assess the implications of the new index by examining the plots of the new ranks against the plots of the reference index.

196. Second, a table showing the index score and the ranking of the ATSIC region is shown. In the same table a column headed 'Disadvantage quartile' shows which one of the four quartiles the Region falls in.

197. Finally, a table is presented which shows estimates of the eigenvector associated with the variables that are significantly associated with Indigenous disadvantage.

### *5.1.3 Census Analysis at the ATSIC Region level*

198. ***The index:*** This section presents results at ATSIC region level from the refinements discussed in section 5.1.1 to the index presented in ABS (2000b).

199. ***The data:*** The index is based on only data from or derivable from ABS 1996 Census. Interpretation of results from the index should take into account the data quality concerns discussed in section 3 of the paper.

200. ***Figure 1*** compares the refined index with the Stage 1 Index (ABS 2000b) and shows that while the refinement leads to some changes in the ranking for some ATSIC regions, these changes are marginal.

201.    ***Table 6*** shows the ranking of the 36 ATSIC regions in order of their socioeconomic disadvantage.  As Figure A5-1 has shown this ranking is only marginally different from that based on the index in ABS (2000b).

202.    ***Table 7*** shows estimates of the eigenvector associated with the variables that are significantly associated with Indigenous disadvantage.  The more important of these variables have factor loadings greater than 0.29, and include the following:

   (i)    percentage of persons aged 15 and over with no post-school qualification;

  (ii)    poverty rate: household income (percentage of persons whose equivalised household income is below poverty line);

 (iii)    CDEP as percentage of total working age population;

 (iv)    percentage of males aged 15 years and over classified as Labourers and Related Workers;

  (v)    percentage of females aged 15 years and over classified as Labourers and Related Workers;

 (vi)    percentage of occupied dwellings with two or more families;  and

(vii)    percentage of households with a person/bedroom ratio of 3 or more.

203.    The model in Table 7 explains over 72 percent of the variance in the data.

**Figure 1**     A COMPARISON BETWEEN THE INDEX IN ABS (2000B) BASED ON
THE 1996 CENSUS DATA ONLY AND THE REFINED INDEX
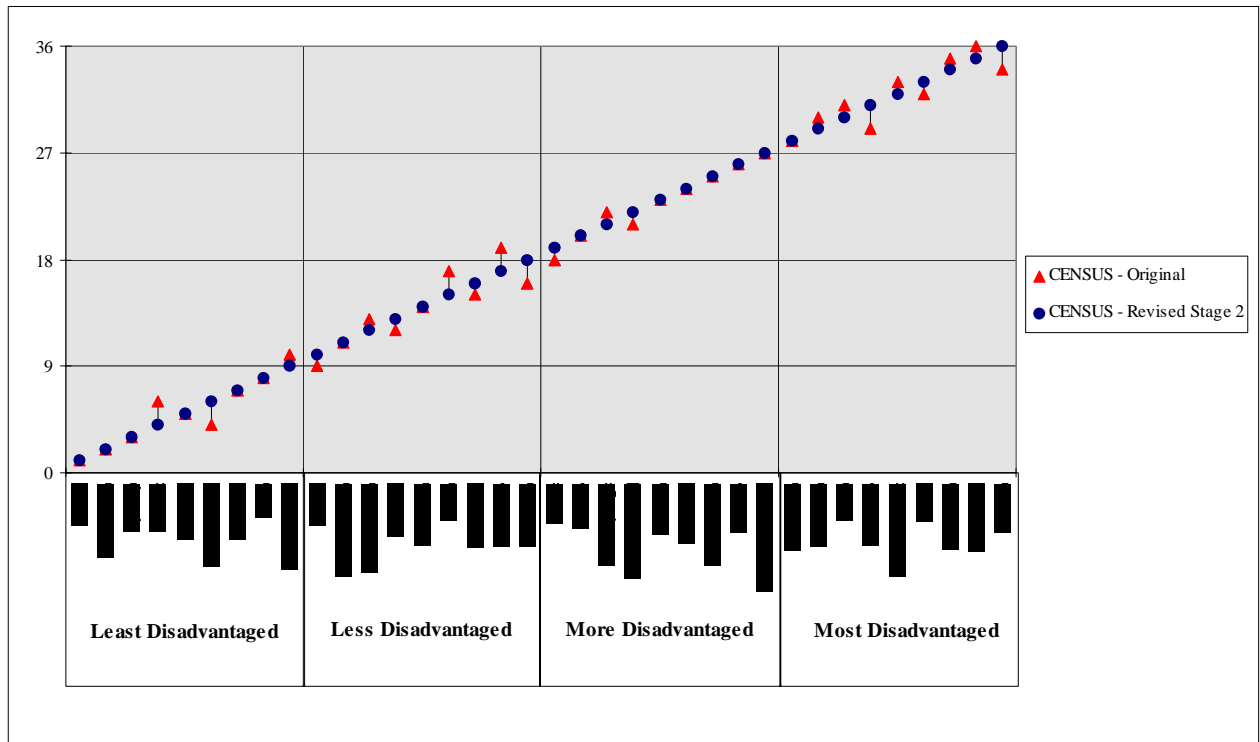
**Table 6**    INDEX SCORES AND RANK BY ATSIC REGION BASED ON A 1996
CENSUS ONLY INDEX

| AREG | AREGNAME | CENSUS (Revised) | RANK From least to most disadvantaged | DISADVANTAGE Quadrant |
|---|---|---|---|---|
| 29 | Hobart | 874.6 | 1 | Least |
| 7 | Wangaratta | 882.8 | 2 | Least |
| 4 | Sydney | 895.2 | 3 | Least |
| 8 | Ballarat | 897.7 | 4 | Least |
| 9 | Brisbane | 897.9 | 5 | Least |
| 1 | Queanbeyan | 898.5 | 6 | Least |
| 17 | Adelaide | 908.2 | 7 | Least |
| 20 | Perth | 911.6 | 8 | Least |
| 3 | Coffs Harbour | 913.1 | 9 | Least |
| 36 | Darwin | 915.0 | 10 | Less |
| 6 | Wagga Wagga | 934.5 | 11 | Less |
| 13 | Rockhampton | 936.3 | 12 | Less |
| 24 | Narrogin | 946.5 | 13 | Less |
| 5 | Tamworth | 949.2 | 14 | Less |
| 14 | Roma | 955.6 | 15 | Less |
| 16 | Townsville | 964.1 | 16 | Less |
| 27 | Kalgoorlie | 967.6 | 17 | Less |
| 28 | Geraldton | 968.6 | 18 | Less |
| 10 | Cairns | 969.1 | 19 | More |
| 2 | Bourke | 974.9 | 20 | More |
| 30 | Alice Springs | 982.0 | 21 | More |
| 25 | South Hedland | 995.2 | 22 | More |
| 18 | Ceduna | 1000.3 | 23 | More |
| 11 | Mount Isa | 1000.4 | 24 | More |
| 19 | Port Augusta | 1023.8 | 25 | More |
| 21 | Broome | 1025.8 | 26 | More |
| 15 | Torres Strait Area | 1038.3 | 27 | More |
| 22 | Kununurra | 1103.5 | 28 | Most |
| 12 | Cooktown | 1107.7 | 29 | Most |
| 26 | Derby | 1123.2 | 30 | Most |
| 32 | Katherine | 1133.1 | 31 | Most |
| 35 | Tennant Creek | 1140.1 | 32 | Most |
| 31 | Jabiru | 1157.4 | 33 | Most |
| 23 | Warburton | 1181.7 | 34 | Most |
| 34 | Nhulunbuy | 1207.7 | 35 | Most |
| 33 | Aputula | 1218.9 | 36 | Most |

204.    These rankings are based on a variety of datasets, some of which are subject to concerns about data quality, so the results are indicative only.  For this reason, the regions have been grouped into quartiles (each covering 9 regions) with the following labels indicating relative disadvantage within the Indigenous population: "Least disadvantaged", "Less disadvantaged", "More disadvantaged" and "Most disadvantaged".  Within each quartile the ranking of a region is variable.  However results are very robust between quartiles — that is, regions rarely move between quartiles under varying assumptions.

**Table 7** ESTIMATES OF THE EIGENVECTOR FOR THE INDEX BASED ON 1996 CENSUS ONLY, AT ATSIC REGION LEVEL

| | | |
|---|---|---|
| Eigenvalue (first principal component) | | 9.3775 |
| Proportion of variance explained | | 0.7213 |

| *Disadvantage category* and variable name | Variable Description | Eigenvector |
|---|---|---|
| *Education* | | |
| NOQUAL | % of persons aged 15 and over with no post-school qualification | 0.2982 |
| NOSCH | % of persons aged 15 and over who never went to school | 0.2638 |
| PRFLUEN | % of persons aged 15 and over lacking English fluency | 0.2781 |
| *Family structure* | | |
| | None of the variables were significant | |
| *Income/Poverty* | | |
| POVHH | % of persons whose equivalised household income is below poverty line | 0.3004 |
| *Labour market* | | |
| UNEMCDEP | CDEP-employed as % of labour force | 0.3079 |
| NILF | % of working age persons not in the Labour force | 0.1476 |
| MLABOUR | % males aged 15 years and over classified as Labourers and Related Workers | 0.2988 |
| FLABOUR | % females aged 15 years and over classified as Labourers and Related Workers | 0.3040 |
| *Housing* | | |
| CENSRENT | % of households renting (all sources) | 0.1518 |
| MULTFAM | % of occupied dwellings with two or more families | 0.3062 |
| IMPDWELL | % households in improvised dwellings | 0.2818 |
| BEDRATIO | % of households with a person/bedroom ratio of 3 or more | 0.3138 |
| *Accessibility/Mobility* | | |
| NOCAR | % occupied private dwellings witn no registered motor vehicle | 0.2846 |

Notes:

The *eigenvalue* Indicates the amount of variance underlying all the variables associated with the principal component.

The sum of eigenvalues equals the number of variables. Hence the eigenvalue divided by the number of variables gives the proportion of the variance explained by the principal component.

The *eigenvector* shows the factor loadings or weights of the variables when combined together.

### 5.2 An Experimental General Index - Census plus NATSIS plus national perinatal data

205.    ***The index***:  This section presents results at ATSIC region level on a general socioeconomic index of Indigenous disadvantage.

206.    ***The data:***  The index is constructed using a combination of data from ABS 1996 Census data, NATSIS and national perinatal data.  Interpretation of results from the index should take into account the data quality concerns discussed in section 3 of the paper.

207.    Figure 2 compares the experimental general index (Census, NATSIS and national perinatal data) with the refined Census only index and shows again that while there are some changes in the ranking for some ATSIC regions, these changes are marginal.  Only five ATSIC Regions change quartiles as a result of the introduction of new data.  These are: Ballarat, Rockhampton, Townsville, Kalgoorlie and Alice Springs.

**Figure 2**    A COMPARISON OF THE RANKING OF THE CENSUS ONLY INDEX AND THE CENSUS PLUS OTHER DATA SETS INDEX
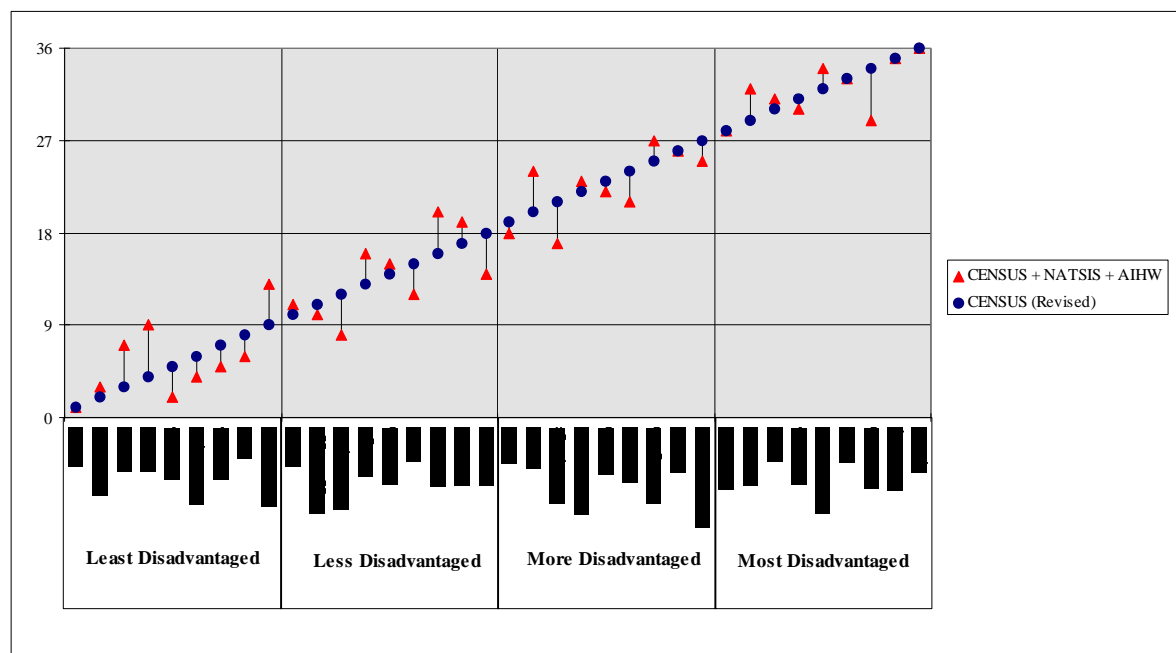


208.    Table 8 shows the ranking of the 36 ATSIC regions in order of their socioeconomic disadvantage on the basis of the experimental general index (Census, NATSIS and national perinatal data).  Table 9 shows estimates of the eigenvector associated with the variables that are significantly associated with Indigenous disadvantage.

209.    The following variables have factor loadings greater than 0.2:

   (i)  percentage of persons aged 15 and over with no post-school qualification;

   (ii)  percentage of persons aged 15 and over lacking English fluency;

(iii)  poverty rate: household income (percentage of persons whose equivalised household income is below poverty line);

(iv)  CDEP as percentage of total working age population;

(v)  percentage of males aged 15 years and over classified as Labourers and Related Workers;

(vi)  percentage of females aged 15 years and over classified as Labourers and Related Workers;

(vii)  percentage of occupied dwellings with two or more families;

(viii)  percentage of households in improvised dwellings;

(ix)  percentage of households with a person/bedroom ratio of 3 or more;

(x)  proportion of households who are not satisfied with current dwelling; and

(xi)  percentage of occupied private dwellings with no registered motor vehicle

**Table 8**  INDEX SCORE AND RANK BY ATSIC REGION BASED ON AN INDEX CONSTRUCTED USING ABS 1996 CENSUS PLUS NATSIS AND NATIONAL PERINATAL DATA

| AREG | AREGNAME | CENSUS + NATSIS + AIHW INDEX | RANK From least to most disadvantaged | DISADVANTAGE Quadrant |
|------|----------|------|------|------|
| 29 | Hobart | 870.8 | 1 | Least |
| 9 | Brisbane | 885.8 | 2 | Least |
| 7 | Wangaratta | 887.5 | 3 | Least |
| 1 | Queanbeyan | 903.6 | 4 | Least |
| 17 | Adelaide | 911.6 | 5 | Least |
| 20 | Perth | 913.7 | 6 | Least |
| 4 | Sydney | 914.2 | 7 | Least |
| 13 | Rockhampton | 914.5 | 8 | Least |
| 8 | Ballarat | 916.0 | 9 | Least |
| 6 | Wagga Wagga | 916.6 | 10 | Less |
| 36 | Darwin | 924.9 | 11 | Less |
| 14 | Roma | 945.7 | 12 | Less |
| 3 | Coffs Harbour | 948.5 | 13 | Less |
| 28 | Geraldton | 949.0 | 14 | Less |
| 5 | Tamworth | 949.3 | 15 | Less |
| 24 | Narrogin | 953.0 | 16 | Less |
| 30 | Alice Springs | 960.6 | 17 | Less |
| 10 | Cairns | 960.7 | 18 | Less |
| 27 | Kalgoorlie | 961.1 | 19 | More |
| 16 | Townsville | 978.0 | 20 | More |
| 11 | Mount Isa | 988.2 | 21 | More |
| 18 | Ceduna | 988.8 | 22 | More |
| 25 | South Hedland | 990.1 | 23 | More |
| 2 | Bourke | 1005.8 | 24 | More |
| 15 | Torres Strait Area | 1009.5 | 25 | More |
| 21 | Broome | 1017.3 | 26 | More |
| 19 | Port Augusta | 1055.0 | 27 | More |
| 22 | Kununurra | 1107.6 | 28 | Most |
| 23 | Warburton | 1111.3 | 29 | Most |
| 32 | Katherine | 1119.6 | 30 | Most |
| 26 | Derby | 1129.1 | 31 | Most |
| 12 | Cooktown | 1148.7 | 32 | Most |
| 31 | Jabiru | 1157.2 | 33 | Most |
| 35 | Tennant Creek | 1166.2 | 34 | Most |
| 34 | Nhulunbuy | 1206.3 | 35 | Most |
| 33 | Aputula | 1234.3 | 36 | Most |

210.  The model in Table 9 explains about 49 percent of the variance in the data.

211.  These rankings are based on a variety of datasets, some of which are subject to concerns about data quality, so the results are indicative only.  For this reason, the regions have been grouped into quartiles (each covering 9 regions) with the following labels: "Least disadvantaged", "Less disadvantaged", "More disadvantaged" and "Most disadvantaged"  . Within each quartile the ranking of a region is variable.  However results are very robust between quartiles - that is, regions rarely move between quartiles under varying assumptions.

**Table 9**     ESTIMATES OF THE EIGENVECTOR FOR THE INDEX BASED ON ABS 1996 CENSUS PLUS NATSIS AND NATIONAL PERINATAL DATA

| | | |
|---|---|---|
| Eigenvalue | | 16.79 |
| Proportion of variance | | 0.4939 |

| *Disadvantage category* and variable name | Variable description | Eigenvector |
|---|---|---|
| *Education* | | |
| NOQUAL | % of persons aged 15 and over with no post-school | 0.2157 |
| NOSCH | % of persons aged 15 and over who never went to | 0.1925 |
| NOSCH16 | % of persons aged 5-16 years who are not attending | 0.1819 |
| LEFTS10 | % of persons aged 15 years and over who had left school below Year 10 | 0.1662 |
| PRFLUEN | % of persons aged 15 and over lacking English | 0.2016 |
| | | |
| *Family structure* | | |
| | None of the variables were | |
| | | |
| *Income/Poverty* | | |
| POVHH | % of persons whose equivalised household income is below poverty | 0.2223 |
| LOWINC | % of persons aged 15 years and over whose annual income is $12,000 or less | 0.1823 |
| | | |
| *Labour market* | | |
| UNEMCDEP | CDEP as % of total working age | 0.2260 |
| PARTEMP | % of employed persons who worked less than 35 | 0.1840 |
| NILF | % of working age persons not in the Labour | 0.1019 |
| MLABOUR | % males aged 15 years and over classified as Labourers and Related Workers | 0.2221 |
| FLABOUR | % females aged 15 years and over classified as Labourers and Related Workers | 0.2231 |
| | | |
| *Housing* | | |
| CENSRENT | % of households renting (all sources) | 0.1027 |
| MULTFAM | % of occupied dwellings with two or more | 0.2242 |
| IMPDWELL | % households in improvised | 0.2070 |
| BEDRATIO | % of households with a person/bedroom ratio of 3 or | 0.2289 |
| HLIV | % of unsatisfied households: problem with dwelling- 'not enough living | 0.1304 |
| HBED | % of unsatisfied households: 'not enough | 0.1248 |
| HINSUL | % of unsatisfied households: 'it needs better | 0.1284 |
| HBATH | % of unsatisfied households: 'inadequate bathing | 0.1709 |
| HREPAIR | % of unsatisfied households: 'it needs | 0.1276 |
| UNSATD | % of households who are not satisfied with current | 0.2095 |

cont…

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Table 9 continued…

| *Disadvantage category* and variable name | Variable description | Eigenvector |
|---|---|---|
| *Access to infrastructure* | | |
| NOCAR | % occupied private dwellings witn no registered motor vehicle | 0.2115 |
| HWATER | % of households with no running water connected | 0.1517 |
| DELECTGAS | % of unsatisfied households: \ 'not having electricity or gas' | 0.1760 |
| NOGARB | % of households that don't have garbage collection | 0.1193 |
| DISTAS | % of Year 10 students that travelled more than 25km to School | 0.1609 |
| | | |
| *Health* | | |
| ALCO | % of persons aged 13 years and over who perceived alcohol as main problem in area | 0.0473 |
| SMOKE_M | % of males aged 13 years and over who are smokers | 0.1185 |
| FETAL | Fetal deaths as % of all births | 0.1500 |
| NEONATAL | Neonatal deaths as % of all births | 0.1169 |
| PERINAT | Perinatal deaths as % of all births | 0.1587 |
| LOWBWGT | Low birthweight babies (< 2.5kg, live births) as % of all births | 0.1357 |
| | | |
| *Other factors* | | |
| Violence | % of persons aged 13 years and over who perceived family violence as a problem in local area | 0.0954 |

Notes:

The *eigenvalue* Indicates the amount of variance underlying all the variables associated with the principal component.

The sum of eigenvalues equals the number of variables. Hence the eigenvalue divided by the number of variables gives the proportion of the variance explained by the principal component.

The *eigenvector* shows the factor loadings or weights of the variables when combined together.

### 5.3 An Experimental Economic Index

212. ***The index:*** This section presents results at ATSIC region level, an economic index of Indigenous disadvantage which is a sub-division of the general index. The economic index reflects disadvantage relating to education, training and employment.

213. ***The data:*** The index is constructed using a combination of data from ABS 1996 Census data and NATSIS. Interpretation of results from the index should take into account the data quality concerns discussed in section 3 of the paper.

214. Figure 3 compares the experimental economic index (Census, NATSIS and national perinatal statistics) with the refined Census only index and shows again that while there are some changes in the ranking for some ATSIC regions, these changes are marginal.

215. Table 10 shows the ranking of the 36 ATSIC regions in order of their socioeconomic disadvantage using economic index. Table 11 shows estimates of the eigenvector associated with the variables that are significantly associated with Indigenous disadvantage. The following variables have factor loadings greater than 0.29:

   (i) percentage of persons aged 15 and over with no post-school qualification;

  (ii) poverty rate: household income (percentage of persons whose equivalised household income is below poverty line);

 (iii) CDEP as percentage of total working age population;

 (iv) percentage of males aged 15 years and over classified as Labourers and Related Workers;  and

  (v) perecntage of females aged 15 years and over classified as Labourers and Related Workers.

**Figure 3** A COMPARISON OF THE EXPERIMENTAL ECONOMIC INDEX
WITH THE CENSUS (REFINED) DISADVANTAGE I INDEX
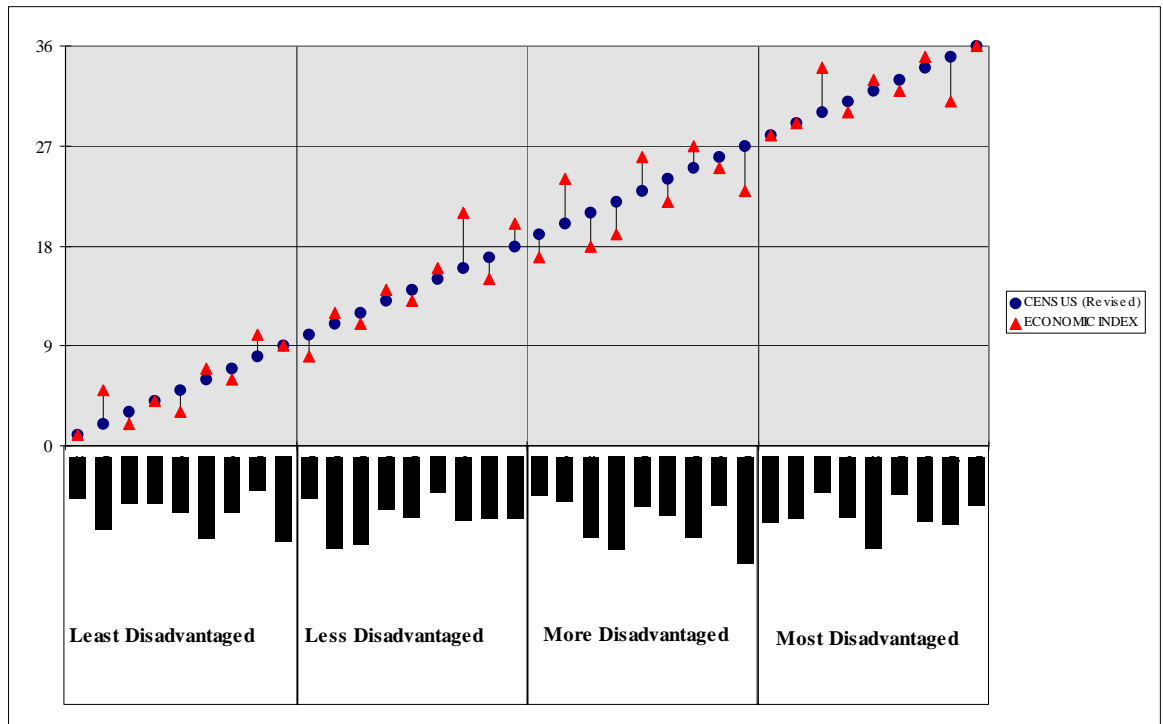
**Table 10**    INDEX SCORE AND RANK BY ATSIC REGION BASED ON AN
EXPERIMENTAL ECONOMIC INDEX

| AREG | AREGNAME | ECONOMIC INDEX | RANK | DISADVANTAGE Quadrant |
|---|---|---|---|---|
| 29 | Hobart | 876.7 | 1 | Least |
| 4 | Sydney | 877.3 | 2 | Least |
| 9 | Brisbane | 886.8 | 3 | Least |
| 8 | Ballarat | 890.1 | 4 | Least |
| 7 | Wangaratta | 890.1 | 5 | Least |
| 17 | Adelaide | 906.9 | 6 | Least |
| 1 | Queanbeyan | 907.3 | 7 | Least |
| 36 | Darwin | 913.2 | 8 | Least |
| 3 | Coffs Harbour | 913.6 | 9 | Least |
| 20 | Perth | 915.7 | 10 | Less |
| 13 | Rockhampton | 923.8 | 11 | Less |
| 6 | Wagga Wagga | 947.6 | 12 | Less |
| 5 | Tamworth | 948.9 | 13 | Less |
| 24 | Narrogin | 950.2 | 14 | Less |
| 27 | Kalgoorlie | 951.3 | 15 | Less |
| 14 | Roma | 966.8 | 16 | Less |
| 10 | Cairns | 970.7 | 17 | Less |
| 30 | Alice Springs | 979.0 | 18 | Less |
| 25 | South Hedland | 980.0 | 19 | More |
| 28 | Geraldton | 981.7 | 20 | More |
| 16 | Townsville | 989.9 | 21 | More |
| 11 | Mount Isa | 996.5 | 22 | More |
| 15 | Torres Strait Are | 997.6 | 23 | More |
| 2 | Bourke | 1000.7 | 24 | More |
| 21 | Broome | 1008.5 | 25 | More |
| 18 | Ceduna | 1013.4 | 26 | More |
| 19 | Port Augusta | 1046.3 | 27 | More |
| 22 | Kununurra | 1110.3 | 28 | Most |
| 12 | Cooktown | 1125.1 | 29 | Most |
| 32 | Katherine | 1126.6 | 30 | Most |
| 34 | Nhulunbuy | 1132.5 | 31 | Most |
| 31 | Jabiru | 1144.9 | 32 | Most |
| 35 | Tennant Creek | 1146.8 | 33 | Most |
| 26 | Derby | 1155.6 | 34 | Most |
| 23 | Warburton | 1180.3 | 35 | Most |
| 33 | Aputula | 1247.2 | 36 | Most |

216.    The model in Table 11 explains about 64 percent of the variance in the data.

217.    These rankings are based on a variety of datasets, some of which are subject to concerns about data quality, so the results are indicative only.  For this reason, the regions have been grouped into quartiles (each covering 9 regions) with the following labels: "Least disadvantaged", "Less disadvantaged", "More disadvantaged" and "Most disadvantaged". Within each quartile the ranking of a region is variable.  However results are very robust between quartiles - that is, regions rarely move between quartiles under varying assumptions.

**Table 11**   ESTIMATES OF THE EIGENVECTOR FOR AN EXPERIMENTAL ECONOMIC INDEX BASED ON ABS 1996 CENSUS PLUS DATA FROM NATSIS

| | | |
|---|---|---|
| Eigenvalue (first principal component) | | 9.65 |
| Proportion of variance explained | | 0.6430 |

| *Disadvantage category* and variable name | Variable description | Eigenvector |
|---|---|---|
| *Education* | | |
| NOQUAL | % of persons aged 15 and over with no post-school qualification | 0.2951 |
| NOSCH | Persons aged 15 and over who never went to school | 0.2702 |
| NOSCH16 | Proportion of persons aged 5-16 years who are not attending school | 0.2468 |
| LEFTS10 | Proportion of persons aged 15 years and over who had left school below Year 10 | 0.2392 |
| PRFLUEN | % of persons aged 15 and over lacking English fluency | 0.2707 |
| *Income/Poverty* | | |
| POVHH | Poverty rate: household income (% of persons whose equivalised household income is below poverty line) | 0.2981 |
| LOWINC | Proportion of persons aged 15 years and over whose annual income is $12,000 or less | 0.2584 |
| *Labour market* | | |
| UNEMCDEP | CDEP as % of total working age population | 0.3001 |
| PARTEMP | Proportion of employed persons who worked less than 35 hours/week | 0.2642 |
| NILF | % of working age persons not in the Labour force | 0.1342 |
| MLABOUR | % males aged 15 years and over classified as Labourers and Related Workers | 0.2950 |
| FLABOUR | % females aged 15 years and over classified as Labourers and Related Workers | 0.2938 |
| *Housing* | | |
| CENSRENT | % of households renting (all sources) | 0.1559 |
| *Access to infrastructure* | | |
| NOCAR | % occupied private dwellings witn no registered motor vehicle | 0.2707 |
| DISTAS | Proportion of Year 10 students that travelled more than 25km to School | 0.2098 |

Notes:

The *eigenvalue* Indicates the amount of variance underlying all the variables associated with the principal component.

The sum of eigenvalues equals the number of variables. Hence the eigenvalue divided by the number of variables gives the proportion of the variance explained by the principal component.

The *eigenvector* shows the factor loadings or weights of the variables when combined together.

*ABS Consultancy*

## 5.4 An Experimental Habitat Index

218.  ***The index***:  This section presents, at ATSIC region level, an experimental habitat index of Indigenous disadvantage which is a sub-division of the general index.  The habitat index reflects disadvantage relating to health, housing and infrastructure.

219.  ***The data***:  The index is constructed using a combination of data from ABS 1996 Census data, NATSIS and national perinatal data.  Interpretation of results from the index should take into account the data quality concerns discussed in section 3 of the paper.

220.  Figure 4 compares the experimental habitat index (Census, NATSIS and national perinatal data) with the refined Census only index.  By limiting the set of variables to create a habitat index there are changes in the ranking of ATSIC regions.  The main drivers changing the rankings are the NATSIS household variables. accessible areas such as Sydney and Coffs Harbour change rankings significantly from 'least disadvantaged' to 'more disadvantaged'.

**Figure 4**      A COMPARISON OF THE HABITAT INDEX WITH THE CENSUS
                 ONLY (REFINED) INDEX
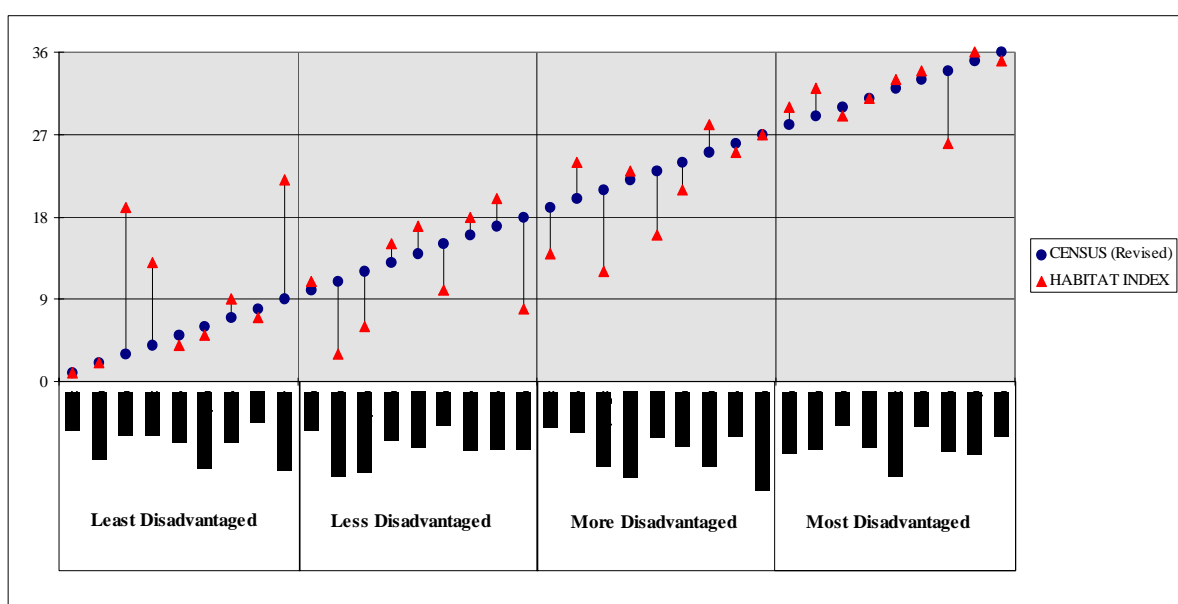


221.  Table 12 shows the ranking of the 36 ATSIC regions in order of their socioeconomic disadvantage using economic index.  Table 13 shows estimates of the eigenvector associated with the variables that are significantly associated with Indigenous disadvantage.  The following variables have factor loadings greater than 0.2:

(i)  all the quality of housing variables (except the variable on the percentage of households renting (all sources));

(ii)  percentage of occupied private dwellings with no registered motor vehicle;

(iii)  proportion of unsatisfied households who reported that the main problem with dwelling is 'not having electricity or gas';

(iv)  foetal deaths as percentage of all births;  and

 (v)  perinatal deaths as percentage  of all births.

**Table 12**     INDEX SCORE AND RANK BY ATSIC REGION BASED ON AN
EXPERIMENTAL HABITAT INDEX

| AREG | AREGNAME | HABITAT INDEX | RANK | DISADVANTAGE Quadrant |
|---|---|---|---|---|
| 29 | Hobart | 862.3 | 1 | Least |
| 7 | Wangaratta | 884.0 | 2 | Least |
| 6 | Wagga Wagga | 889.4 | 3 | Least |
| 9 | Brisbane | 891.7 | 4 | Least |
| 1 | Queanbeyan | 904.0 | 5 | Least |
| 13 | Rockhampton | 909.9 | 6 | Least |
| 20 | Perth | 912.3 | 7 | Least |
| 28 | Geraldton | 918.8 | 8 | Least |
| 17 | Adelaide | 921.7 | 9 | Least |
| 14 | Roma | 926.1 | 10 | Less |
| 36 | Darwin | 936.8 | 11 | Less |
| 30 | Alice Springs | 946.7 | 12 | Less |
| 8 | Ballarat | 953.4 | 13 | Less |
| 10 | Cairns | 955.1 | 14 | Less |
| 24 | Narrogin | 958.2 | 15 | Less |
| 18 | Ceduna | 959.1 | 16 | Less |
| 5 | Tamworth | 959.7 | 17 | Less |
| 16 | Townsville | 961.1 | 18 | Less |
| 4 | Sydney | 967.3 | 19 | More |
| 27 | Kalgoorlie | 972.5 | 20 | More |
| 11 | Mount Isa | 978.6 | 21 | More |
| 3 | Coffs Harbour | 994.5 | 22 | More |
| 25 | South Hedland | 1005.9 | 23 | More |
| 2 | Bourke | 1014.9 | 24 | More |
| 21 | Broome | 1026.9 | 25 | More |
| 23 | Warburton | 1027.9 | 26 | More |
| 15 | Torres Strait Are | 1041.5 | 27 | More |
| 19 | Port Augusta | 1068.3 | 28 | Most |
| 26 | Derby | 1091.4 | 29 | Most |
| 22 | Kununurra | 1092.3 | 30 | Most |
| 32 | Katherine | 1095.7 | 31 | Most |
| 12 | Cooktown | 1162.1 | 32 | Most |
| 35 | Tennant Creek | 1173.5 | 33 | Most |
| 31 | Jabiru | 1179.0 | 34 | Most |
| 33 | Aputula | 1187.3 | 35 | Most |
| 34 | Nhulunbuy | 1270.0 | 36 | Most |

222.    The model in Table 13 explains about 44 percent of the variance in the data.

223.    These rankings are based on a variety of datasets, some of which are subject to concerns about data quality, so the results are indicative only.  For this reason, the regions have been grouped into quartiles (each covering 9 regions) with the following labels: "Least disadvantaged", "Less disadvantaged", "More disadvantaged" and "Most disadvantaged". Within each quartile the ranking of a region is variable.  However results are very robust between quartiles - that is, regions rarely move between quartiles under varying assumptions.

**Table 13**     ESTIMATES OF THE EIGENVECTOR FOR AN EXPERIMENTAL HABITAT INDEX BASED ON ABS 1996 CENSUS PLUS DATA FROM NATSIS AND NATIONAL PERINATAL DATA

| | | |
|---|---|---|
| Eigenvalue (first principal component) | | 9.23 |
| Proportion of variance explained | | 0.4393 |

| *Disadvantage category* and variable name | Variable description | Eigenvector |
|---|---|---|
| *Housing* | | |
| CENSRENT | % of households renting (all sources) | 0.1142 |
| MULTFAM | % of  occupied dwellings with two or more families | 0.2937 |
| IMPDWELL | % households in improvised dwellings | 0.2762 |
| BEDRATIO | % of households with a person/bedroom ratio of 3 or more | 0.2931 |
| HLIV | % of unsatisfied households who reported that the main problem with dwelling is 'not enough living area' | 0.2260 |
| HBED | % of unsatisfied households who reported that the main problem with dwelling is 'not enough bedrooms' | 0.2181 |
| HINSUL | % of unsatisfied households who reported that the main problem with dwelling is 'it needs better insulation/ventilation' | 0.2052 |
| HBATH | % of unsatisfied households who reported that the main problem with dwelling is 'inadequate bathing facilities' | 0.2707 |
| HREPAIR | % of unsatisfied households who reported that the main problem with dwelling is 'it needs repair' | 0.2241 |
| UNSATD | % of households who are not satisfied with current dwelling | 0.2837 |
| | | |
| *Access to infrastructure* | | |
| NOCAR | % occupied private dwellings witn no registered motor vehicle | 0.2825 |
| HWATER | Proportion of households with no  running water connected | 0.1768 |
| DELECTGAS | Proportion of unsatisfied households who reported that the main problem with dwelling is 'not having electricity or gas' | 0.2116 |
| NOGARB | Proportion of households that don't have garbage collection | 0.1619 |
| | | |
| *Heal;th* | | |
| ALCO | Proportion of persons aged 13 years and over who perceived alcohol to be main local health problem | 0.0482 |
| SMOKE_M | Proportion of males aged 13 years and over who are smokers | 0.1715 |
| FETAL | Fetal deaths as % of all births | 0.2086 |
| NEONATAL | Neonatal  deaths as % of all births | 0.1785 |
| PERINAT | Perinatal deaths as % of all births | 0.2266 |
| LOWBWGT | Low birthweight babies (< 2.5kg, live births) | 0.1939 |
| | | |
| *Others* | | |
| Violence | Proportion of persons aged 13 years and over who perceived family violence as a problem in local area | 0.1249 |

Notes:

The *eigenvalue* Indicates the amount of variance underlying all the variables associated with the principal component.

The sum of eigenvalues equals the number of variables. Hence the eigenvalue divided by the number of variables gives the proportion of the variance explained by the principal component.

The *eigenvector* shows the factor loadings or weights of the variables when combined together.

### 5.5  An experimental education index

224.    ***The index*:**  This section presents results at ATSIC region level, an experimental education index of Indigenous disadvantage which is a sub-division (by functional area) of the general index.  The education index reflects disadvantage relating to education and training.

225.    ***The data:***    The index is constructed using a combination of data from ABS 1996 Census data and NATSIS.  Interpretation of results from the index should take into account the data quality concerns discussed in section 3 of the paper.

226.    Figure 5 compares the experimental education index (Census and NATSIS) with the refined Census only index.  Table 14 shows the ranking of the 36 ATSIC regions in order of their socioeconomic disadvantage using education index.

**Figure 5**      A COMPARISON OF THE EDUCATION INDEX WITH THE CENSUS ONLY  (REFINED) INDEX
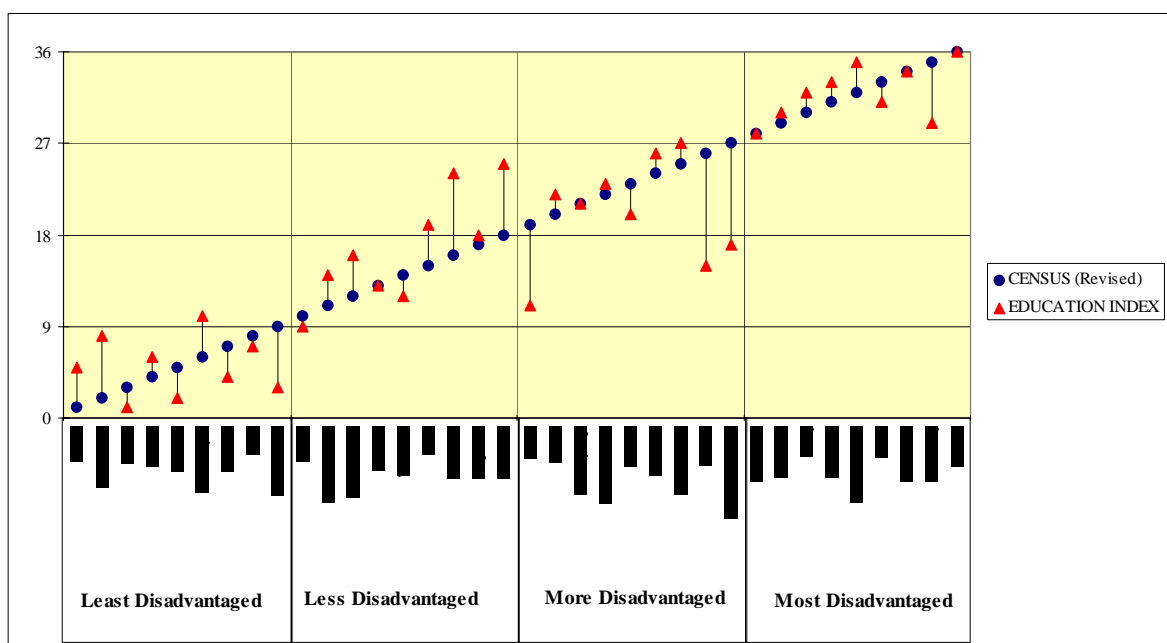


227.    Table 15 shows estimates of the eigenvector associated with the variables that are significantly associated with Indigenous disadvantage.  All the variables have factor loadings greater than 0.3.  The model in Table 15 explains about 70 percent of the variance in the data.

**Table 14**     INDEX SCORES AND RANK BY ATSIC REGION BASED ON AN EXPERIMENTAL EDUCATION INDEX

| AREG | AREGNAME | EDUCATION INDEX | RANK | DISADVANTAGE Quadrant |
|---|---|---|---|---|
| 4 | Sydney | 891.5 | 1 | Least |
| 9 | Brisbane | 895.6 | 2 | Least |
| 3 | Coffs Harbour | 899.3 | 3 | Least |
| 17 | Adelaide | 908.8 | 4 | Least |
| 29 | Hobart | 915.8 | 5 | Least |
| 8 | Ballarat | 919.6 | 6 | Least |
| 20 | Perth | 923.0 | 7 | Least |
| 7 | Wangaratta | 924.5 | 8 | Least |
| 36 | Darwin | 927.7 | 9 | Least |
| 1 | Queanbeyan | 935.0 | 10 | Less |
| 10 | Cairns | 938.1 | 11 | Less |
| 5 | Tamworth | 941.3 | 12 | Less |
| 24 | Narrogin | 947.4 | 13 | Less |
| 6 | Wagga Wagga | 951.9 | 14 | Less |
| 21 | Broome | 952.3 | 15 | Less |
| 13 | Rockhampton | 952.5 | 16 | Less |
| 15 | Torres Strait Area | 957.9 | 17 | Less |
| 27 | Kalgoorlie | 963.3 | 18 | Less |
| 14 | Roma | 965.0 | 19 | More |
| 18 | Ceduna | 982.2 | 20 | More |
| 30 | Alice Springs | 986.2 | 21 | More |
| 2 | Bourke | 988.0 | 22 | More |
| 25 | South Hedland | 988.2 | 23 | More |
| 16 | Townsville | 993.0 | 24 | More |
| 28 | Geraldton | 993.5 | 25 | More |
| 11 | Mount Isa | 1001.6 | 26 | More |
| 19 | Port Augusta | 1031.9 | 27 | More |
| 22 | Kununurra | 1082.3 | 28 | Most |
| 34 | Nhulunbuy | 1094.1 | 29 | Most |
| 12 | Cooktown | 1099.9 | 30 | Most |
| 31 | Jabiru | 1100.3 | 31 | Most |
| 26 | Derby | 1120.3 | 32 | Most |
| 32 | Katherine | 1138.9 | 33 | Most |
| 23 | Warburton | 1154.1 | 34 | Most |
| 35 | Tennant Creek | 1181.3 | 35 | Most |
| 33 | Aputula | 1353.6 | 36 | Most |

228.    These rankings are based on a variety of datasets, some of which are subject to concerns about data quality, so the results are indicative only.  For this reason, the regions have been grouped into quartiles (each covering 9 regions) with the following labels: "Least disadvantaged", "Less disadvantaged", "More disadvantaged" and "Most disadvantaged". Within each quartile the ranking of a region is variable.  However results are very robust between quartiles — that is, regions rarely move between quartiles under varying assumptions.

**Table 15**     ESTIMATES OF THE EIGENVECTOR FOR THE EDUCATION
INDEX BASED ON ABS 1996 CENSUS PLUS DATA FROM NATSIS AND
NATIONAL PERINATAL DATA

| | | |
|---|---|---|
| Eigenvalue (first principal component) | | 4.18 |
| Proportion of variance explained | | 0.6967 |

| *Disadvantage category* and variable name | Variable description | Eigenvector |
|---|---|---|
| *Education* | | |
| NOQUAL | % of persons aged 15 and over with no post-school qualification | 0.4106 |
| NOSCH | % of persons aged 15 and over who never went to school | 0.4252 |
| NOSCH16 | % of persons aged 5-16 years who are not attending school | 0.4229 |
| LEFTS10 | % of persons aged 15 years and over who had left school below Year 10 | 0.3970 |
| PRFLUEN | % of persons aged 15 and over lacking English fluency | 0.4319 |
| | | |
| *Access to infrastructure* | | |
| DISTAS | % of Year 10 students who travelled more than 25km to school | 0.3573 |

Notes:

The *eigenvalue* indicates the amount of variance underlying all the variables associated with the principal component.

The sum of eigenvalues equals the number of variables. Hence the eigenvalue divided by the number of variables gives the proportion of the variance explained by the principal component.

The *eigenvector* shows the factor loadings or weights of the variables when combined together.

## 5.6 An experimental employment and income index

229.     **The index:** This section presents results at ATSIC region level, an experimental employment and income index of Indigenous disadvantage which is a sub-division (by functional area) of the general index.  The employment and income index reflects disadvantage relating to employment and income.

230.     **The data:**  The index is constructed using a combination of data from ABS 1996 Census data and NATSIS.  Interpretation of results from the index should take into account the data quality concerns discussed in section 3 of the paper.

231.     Figure 6 compares the experimental employment and income index (Census and NATSIS) with the refined Census only index.  Table 16 shows the ranking of the 36 ATSIC regions in order of their socioeconomic disadvantage using employment and income index.

232.     Table 17 shows estimates of the eigenvector associated with the variables that are significantly associated with Indigenous disadvantage.  All the variables (except NILF and ARREST) have factor loadings greater than 0.3.  The model in Table 17 explains about 65 percent of the variance in the data.

**Figure 6**      A COMPARISON OF THE EMPLOYMENT INDEX WITH THE CENSUS
ONLY (REFINED) INDEX
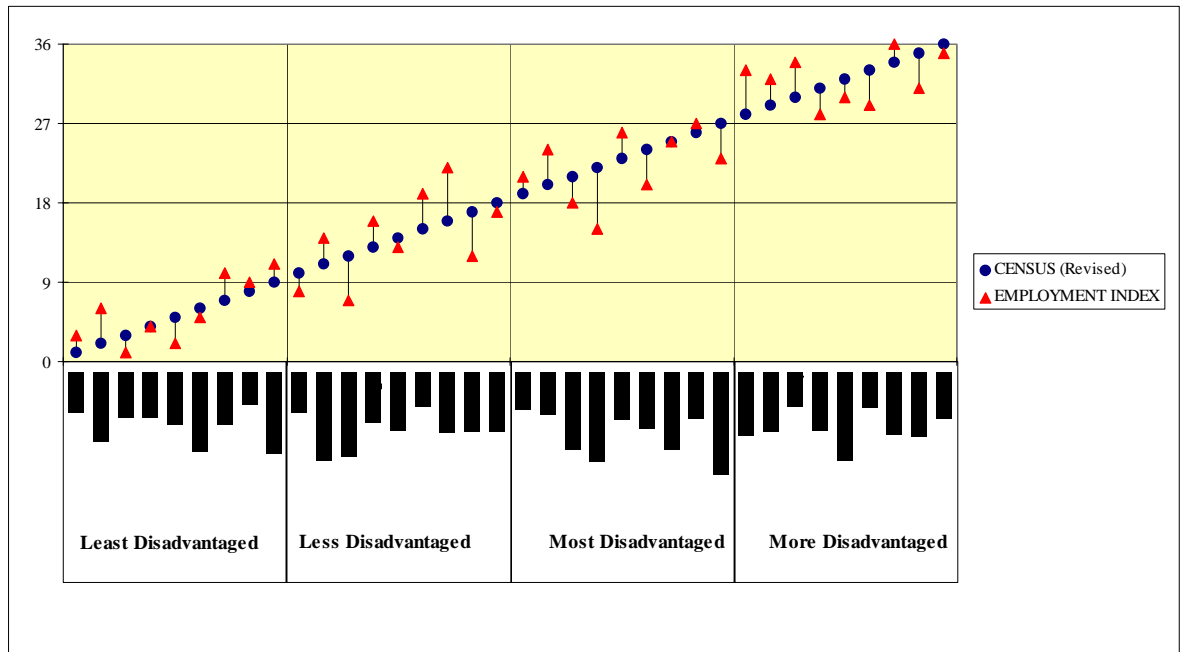
**Table 16**    INDEX SCORES AND RANK BY ATSIC REGION BASED ON AN EXPERIMENTAL EMPLOYMENT AND INCOME INDEX

| AREG | AREGNAME | EMPLOYMENT INDEX | RANK | DISADVANTAGE Quadrant |
|---|---|---|---|---|
| 4 | Sydney | 869.2 | 1 | Least |
| 9 | Brisbane | 882.3 | 2 | Least |
| 29 | Hobart | 883.3 | 3 | Least |
| 8 | Ballarat | 886.5 | 4 | Least |
| 1 | Queanbeyan | 889.1 | 5 | Least |
| 7 | Wangaratta | 891.8 | 6 | Least |
| 13 | Rockhampton | 903.1 | 7 | Least |
| 36 | Darwin | 906.5 | 8 | Least |
| 20 | Perth | 912.1 | 9 | Least |
| 17 | Adelaide | 912.6 | 10 | Less |
| 3 | Coffs Harbour | 929.8 | 11 | Less |
| 27 | Kalgoorlie | 937.0 | 12 | Less |
| 5 | Tamworth | 946.9 | 13 | Less |
| 6 | Wagga Wagga | 950.8 | 14 | Less |
| 25 | South Hedland | 953.9 | 15 | Less |
| 24 | Narrogin | 960.6 | 16 | Less |
| 28 | Geraldton | 961.9 | 17 | Less |
| 30 | Alice Springs | 964.0 | 18 | Less |
| 14 | Roma | 966.1 | 19 | More |
| 11 | Mount Isa | 988.8 | 20 | More |
| 10 | Cairns | 989.7 | 21 | More |
| 16 | Townsville | 992.7 | 22 | More |
| 15 | Torres Strait Area | 999.3 | 23 | More |
| 2 | Bourke | 1019.8 | 24 | More |
| 19 | Port Augusta | 1051.0 | 25 | More |
| 18 | Ceduna | 1056.9 | 26 | More |
| 21 | Broome | 1059.1 | 27 | More |
| 32 | Katherine | 1111.9 | 28 | Most |
| 31 | Jabiru | 1124.7 | 29 | Most |
| 35 | Tennant Creek | 1125.1 | 30 | Most |
| 34 | Nhulunbuy | 1141.9 | 31 | Most |
| 12 | Cooktown | 1148.5 | 32 | Most |
| 22 | Kununurra | 1148.6 | 33 | Most |
| 26 | Derby | 1172.0 | 34 | Most |
| 33 | Aputula | 1176.0 | 35 | Most |
| 23 | Warburton | 1186.5 | 36 | Most |

233.    These rankings are based on a variety of datasets, some of which are subject to concerns about data quality, so the results are indicative only. For this reason, the regions have been grouped into quartiles (each covering 9 regions) with the following labels: "Least disadvantaged", "Less disadvantaged", "More disadvantaged" and "Most disadvantaged" . Within each quartile the ranking of a region is variable. However results are very robust between quartiles — that is, regions rarely move between quartiles under varying assumptions.

**Table 17**    ESTIMATES OF THE EIGENVECTOR FOR THE EMPLOYMENT AND INCOME INDEX BASED ON ABS 1996 CENSUS PLUS DATA FROM NATSIS

| Eigenvalue (first principal component) | 5.83 |
|---|---|
| Proportion of variance explained | 0.6475 |

| *Disadvantage category* and variable name | Variable description | Eigenvector |
|---|---|---|
| *Income* | | |
| POVHH | Poverty rate: household income (% of persons whose equivalised household income is below poverty line) | 0.3837 |
| LOW INC | Proportion of persons aged 15 years and over whose annual income is $12,000 or less | 0.3264 |
| | | |
| *Labour market* | | |
| UNEMCDEP | CDEP as % of total working age population | 0.3976 |
| ECDEP | Proportion of persons aged 15 years and over whose main source of income is CDEP | 0.3730 |
| PARTEMP | Proportion of employed persons who worked less than 35 hours/week | 0.3570 |
| NILF | % of working age persons not in the Labour force | 0.1203 |
| | | |
| MLABOUR | % males aged 15 years and over classified as Labourers and Related Workers | 0.3916 |
| FLABOUR | % females aged 15 years and over classified as Labourers and Related Workers | 0.3874 |
| | | |
| *Others* | | |
| ARREST | Proportion of persons aged 13 years and over who had been arrested in last five years | 0.0602 |

Notes:

The *eigenvalue* Indicates the amount of variance underlying all the variables associated with the principal component.

The sum of eigenvalues equals the number of variables. Hence the eigenvalue divided by the number of variables gives the proportion of the variance explained by the principal component.

The *eigenvector* shows the factor loadings or weights of the variables when combined together.

### 5.7 *An Experimental Housing and Infrastructure Index*

234.     ***The index:***     This section presents, at ATSIC region level, an experimental Housing and Infrastructure index of Indigenous disadvantage which is a sub-division of the general index.  The Housing and Infrastructure index reflects disadvantage relating to health, housing and infrastructure.

235.     ***The data:***  The index is constructed using a combination of data from ABS 1996 Census data and NATSIS.  Interpretation of results from the index should take into account the data quality concerns discussed in section 3 of the paper.

236.     Figure 7 compares the experimental housing and infrastructure index with the refined Census only index.   By limiting the set of variables to create a Housing and Infrastructure index there are changes in the ranking of ATSIC regions.

**Figure 7**       COMPARING THE HOUSING AND INFRASTRUCTURE INDEX
                   WITH THE GENERAL DISADVANTAGE INDEXES
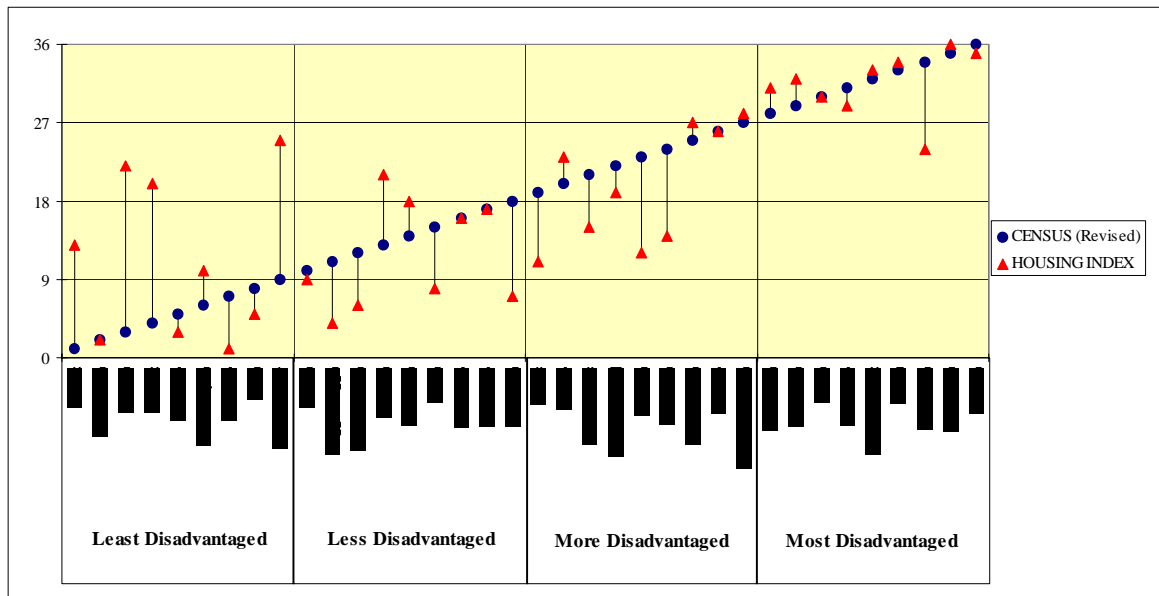


237.     Table 18 shows the ranking of the 36 ATSIC regions in order of their socioeconomic disadvantage using Housing and Infrastructure index.  Table 19 shows estimates of the eigenvector associated with the variables that are significantly associated with Indigenous disadvantage in housing and infrastructure.  All the variables (except NOGARB) have factor loadings greater than 0.2.  The model in Table 19 explains about 55 percent of the variance in the data.

**Table 18**     INDEX SCORE AND RANK BY ATSIC REGION BASED ON AN
EXPERIMENTAL HOUSING AND INFRASTRUCTURE INDEX

| AREG | AREGNAME | HOUSING INDEX | RANK | DISADVANTAGE Quadrant |
|---|---|---|---|---|
| 17 | Adelaide | 894.75 | 1 | Least |
| 7 | Wangaratta | 896.32 | 2 | Least |
| 9 | Brisbane | 898.65 | 3 | Least |
| 6 | Wagga Wagga | 904.31 | 4 | Least |
| 20 | Perth | 904.41 | 5 | Least |
| 13 | Rockhampton | 905.40 | 6 | Least |
| 28 | Geraldton | 908.00 | 7 | Least |
| 14 | Roma | 909.17 | 8 | Least |
| 36 | Darwin | 913.36 | 9 | Least |
| 1 | Queanbeyan | 915.61 | 10 | Less |
| 10 | Cairns | 926.21 | 11 | Less |
| 18 | Ceduna | 928.98 | 12 | Less |
| 29 | Hobart | 935.27 | 13 | Less |
| 11 | Mount Isa | 944.03 | 14 | Less |
| 30 | Alice Springs | 946.34 | 15 | Less |
| 16 | Townsville | 950.98 | 16 | Less |
| 27 | Kalgoorlie | 968.09 | 17 | Less |
| 5 | Tamworth | 970.51 | 18 | Less |
| 25 | South Hedland | 975.94 | 19 | More |
| 8 | Ballarat | 979.44 | 20 | More |
| 24 | Narrogin | 983.56 | 21 | More |
| 4 | Sydney | 983.77 | 22 | More |
| 2 | Bourke | 993.64 | 23 | More |
| 23 | Warburton | 1005.84 | 24 | More |
| 3 | Coffs Harbour | 1020.50 | 25 | More |
| 21 | Broome | 1042.60 | 26 | More |
| 19 | Port Augusta | 1047.09 | 27 | More |
| 15 | Torres Strait Area | 1067.94 | 28 | Most |
| 32 | Katherine | 1079.58 | 29 | Most |
| 26 | Derby | 1117.80 | 30 | Most |
| 22 | Kununurra | 1131.67 | 31 | Most |
| 12 | Cooktown | 1133.88 | 32 | Most |
| 35 | Tennant Creek | 1176.27 | 33 | Most |
| 31 | Jabiru | 1195.13 | 34 | Most |
| 33 | Aputula | 1217.54 | 35 | Most |
| 34 | Nhulunbuy | 1227.40 | 36 | Most |

238.    These rankings are based on a variety of datasets, some of which are subject to concerns about data quality, so the results are indicative only.  For this reason, the regions have been grouped into quartiles (each covering 9 regions) with the following labels: "Least disadvantaged", "Less disadvantaged", "More disadvantaged" and "Most disadvantaged"  . Within each quartile the ranking of a region is variable.  However results are very robust between quartiles — that is, regions rarely move between quartiles under varying assumptions.

**Table 19**  ESTIMATES OF THE EIGENVECTOR FOR AN EXPERIMENTAL HOUSING AND INFRASTRUCTURE INDEX BASED ON ABS INDEX 1996 CENSUS PLUS DATA FROM NATSIS

| Eigenvalue (first principal component) | | 7.72 |
|---|---|---|
| Proportion of variance explained | | 0.5515 |

| *Disadvantage category* and variable name | Variable description | Eigenvector |
|---|---|---|
| *Housing* | | |
| CENSRENT | % of households renting (all sources) | 0.0806 |
| MULTFAM | % of occupied dwellings with two or more families | 0.3075 |
| IMPDWELL | % households in improvised dwellings | 0.2992 |
| BEDRATIO | % of households with a person/bedroom ratio of 3 or more | 0.3085 |
| HLIV | Proportion of unsatisfied households who reported that the main problem with dwelling is 'not enough living area' | 0.2763 |
| HBED | Proportion of unsatisfied households who reported that the main problem with dwelling is 'not enough bedrooms' | 0.2573 |
| HINSUL | Proportion of unsatisfied households who reported that the main problem with dwelling is 'it needs better insulation/ventilation' | 0.2624 |
| HBATH | Proportion of unsatisfied households who reported that the main problem with dwelling is 'inadequate bathing facilities' | 0.3084 |
| HREPAIR | Proportion of unsatisfied households who reported that the main problem with dwelling is 'it needs repair' | 0.2677 |
| UNSATD | Proportion of households who are not satisfied with current dwelling | 0.3188 |
| | | |
| *Access to infrastructure* | | |
| NOCAR | % occupied private dwellings witn no registered motor vehicle | 0.3030 |
| HWATER | Proportion of households with no running water connected | 0.2120 |
| DELECTGAS | Proportion of unsatisfied households who reported that the main problem with dwelling is 'not having electricity or gas' | 0.2517 |
| NOGARB | Proportion of households that don't have garbage collection | 0.1851 |

Notes:

The *eigenvalue* Indicates the amount of variance underlying all the variables associated with the principal component.

The sum of eigenvalues equals the number of variables. Hence the eigenvalue divided by the number of variables gives the proportion of the variance explained by the principal component.

The *eigenvector* shows the factor loadings or weights of the variables when combined together.

## *5.8 Experimental Health Index*

239.    ***The index:***  This section presents, at ATSIC region level, a very experimental health index of Indigenous disadvantage which is a sub-division of the habitat index.  The health index reflects disadvantage relating to health. Appendix 6 provides more detail on how the index was constructed.

240.    ***The data:***  The index is constructed using a combination of data from hospital separations data and national perinatal data.  Interpretation of results from the index should take into account the data quality concerns discussed in section 3 of the paper.

241.    Figure 8 compares the experimental health index (Hospital administrative separations data only) with the refined Census only index.  Figure 9 compares the experimental health index (Hospital administrative separations data, NATSIS and national perinatal data) with the refined Census only index.

**Figure 8**    COMPARING THE RANKING OF ATSIC REGIONS FROM A HEALTH INDEX (HOSPITAL ADMINISTRATIVE SEPARATIONS DATA ONLY) WITH THAT FROM THE INDIGENOUS DISADVANTAGE INDEX (CENSUS ONLY)
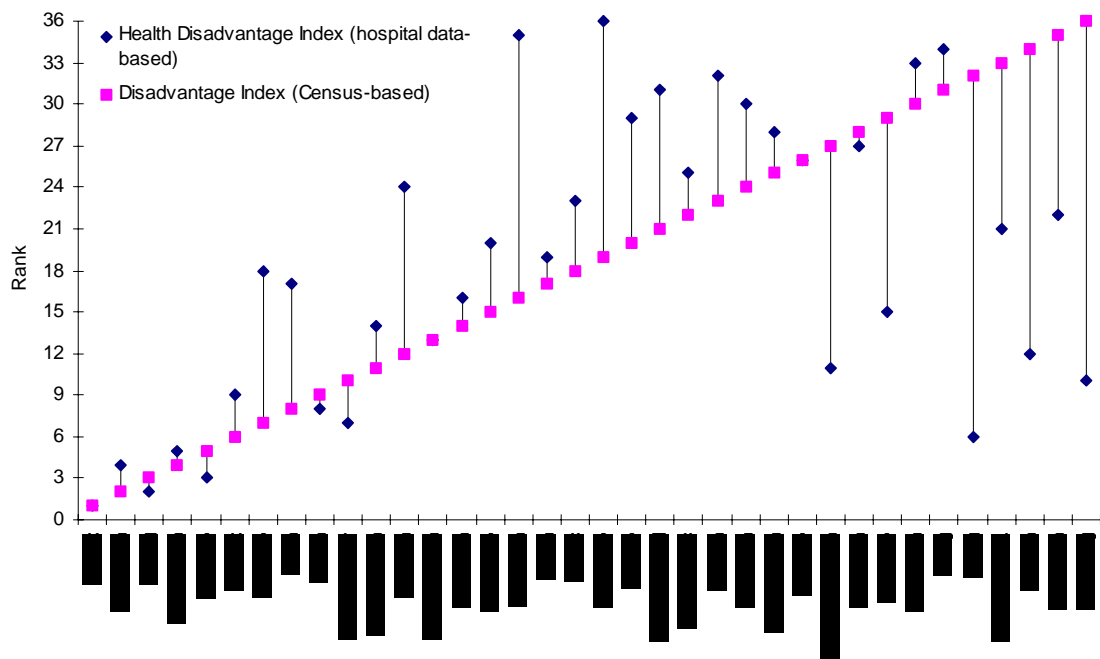


242.    Table 20 shows the ranking of the 36 ATSIC regions in order of their socioeconomic disadvantage using the experimental health index (Hospital administrative separations data and national perinatal data).  Table 21 shows estimates of the eigenvectors associated with the variables that are significantly associated with Indigenous disadvantage.  In the table different versions of a health index are included, where the versions are defined on the basis of what rules are applied in the selection of disadvantage factors to include, and what data sets are accessed in the construction of the index.

**Figure 9**    COMPARING THE RANKING OF ATSIC REGIONS FROM A HEALTH
INDEX (HOSPITAL ADMINISTRATIVE SEPARATIONS DATA AND
NATIONAL PERINATAL DATA) WITH THAT FROM THE
INDIGENOUS DISADVANTAGE IINDEX (CENSUS ONLY)
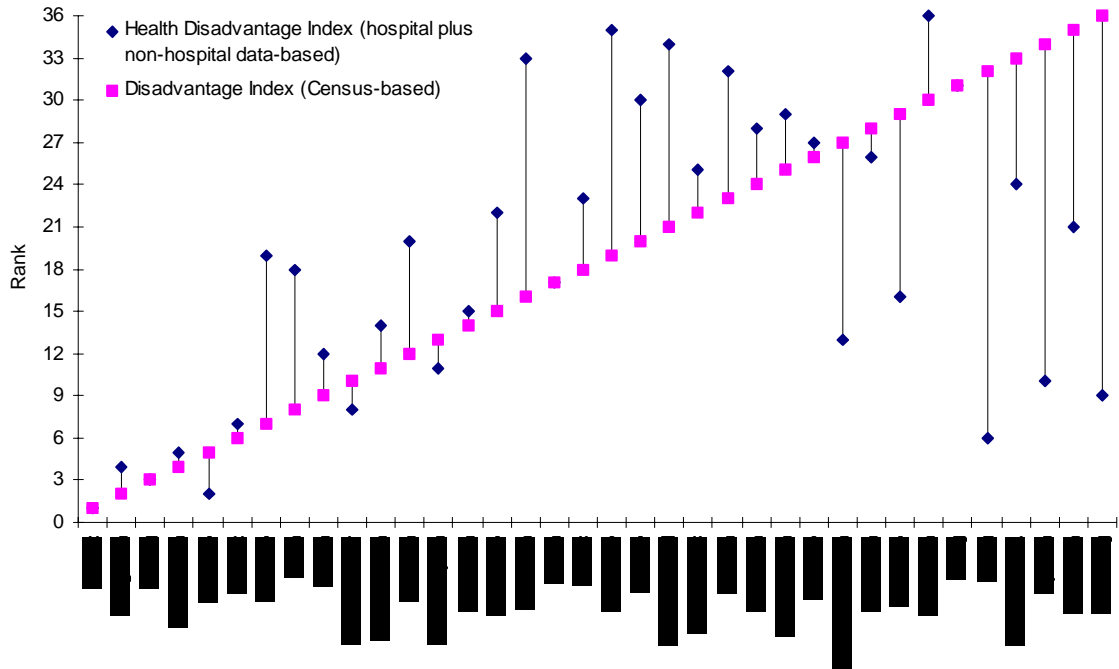


243.    In addition to the reservations listed in section 3.5 about hospital data Figure 8
and Figure 9 suggest that the preliminary health index has further problems which need to be
investigated before the index can be used.  These problems include the following:

(i)    ***The health index ranks ATSIC regions differently from the other
indexes.***  Fourteen of the 31 ATSIC regions seem to change ranking under
the health index compared to their ranking under the general index.  It is
not clear why this is so. It may be that health disadvantage is distributed
differently compared to the other forms of disadvantage.  This hypothesis
is counter-intuitive though because of the known linkages between health
and education, training, income and employment.

(ii)    ***The data on separations could represent both advantage and advantage.***
For example high separation rates in an area (with a hospital) may mean
that the area is advantaged in that individuals in the area have easy access
to a hospital.  On the other hand, low separation rates in an area (without a
hospital) may mean that the area is disadvantaged in that individuals in
the area do not have access to a hospital and their condition is not
adequately reflected in the separations data set.

**Table 20**    DISADVANTAGE HEALTH INDEX SCORES AND RANKING OF ATSIC REGIONS

| ATSIC Code | ATSIC NAME | Health Index, based on: | | | Health Index Rank, based on: | | |
|---|---|---|---|---|---|---|---|
| | | hospital data | non-hospital data | hospital plus non-hospital data | hospital data | non-hospital data | hospital plus non-hospital data |
| 1 | Queanbeyan | 878.1 | 1020.0 | 867.9 | 5 | 20 | 5 |
| 2 | Bourke | 1113.4 | 1000.3 | 1107.4 | 29 | 16 | 30 |
| 3 | Coffs Harbour | 903.7 | 1086.1 | 915.0 | 7 | 28 | 8 |
| 4 | Sydney | 845.1 | 1083.4 | 863.2 | 2 | 27 | 3 |
| 5 | Tamworth | 981.3 | 1061.1 | 978.3 | 16 | 26 | 15 |
| 6 | Wagga Wagga | 962.9 | 1053.3 | 958.2 | 14 | 25 | 14 |
| 7 | Wangaratta | 871.8 | 1117.7 | 865.3 | 4 | 33 | 4 |
| 8 | Ballarat | 912.2 | 1176.1 | 894.2 | 9 | 36 | 7 |
| 9 | Brisbane | 857.7 | 1026.6 | 840.0 | 3 | 22 | 2 |
| 10 | Cairns | 1020.0 | 955.3 | 1035.2 | 23 | 12 | 23 |
| 11 | Mount Isa | 1114.1 | 889.2 | 1105.5 | 30 | 4 | 28 |
| 12 | Cooktown | 1137.1 | 1132.5 | 1158.7 | 33 | 34 | 36 |
| 13 | Rockhampton | 939.7 | 970.2 | 928.9 | 13 | 13 | 11 |
| 14 | Roma | 1007.4 | 1025.6 | 988.0 | 19 | 21 | 17 |
| 15 | Torres Strait Area | 926.5 | 974.4 | 946.3 | 11 | 14 | 13 |
| 16 | Townsville | 1011.5 | 905.3 | 1027.9 | 20 | 9 | 22 |
| 17 | Adelaide | 995.2 | 1110.0 | 996.6 | 18 | 32 | 19 |
| 18 | Ceduna | 1130.4 | 1094.0 | 1125.3 | 32 | 30 | 32 |
| 19 | Port Augusta | 1102.0 | 1091.3 | 1106.8 | 28 | 29 | 29 |
| 20 | Perth | 982.5 | 1101.1 | 994.5 | 17 | 31 | 18 |
| 21 | Broome | 1076.9 | 1018.8 | 1075.6 | 26 | 19 | 27 |
| 22 | Kununurra | 1091.6 | 901.7 | 1058.8 | 27 | 8 | 26 |
| 23 | Warburton | 1019.7 | 889.7 | 1025.5 | 22 | 5 | 21 |
| 24 | Narrogin | 1034.9 | 1046.6 | 1018.4 | 24 | 24 | 20 |
| 25 | South Hedland | 1124.4 | 1031.3 | 1145.4 | 31 | 23 | 34 |
| 26 | Derby | 1143.0 | 939.1 | 1124.4 | 34 | 11 | 31 |
| 27 | Kalgoorlie | 1166.9 | 1162.3 | 1155.6 | 36 | 35 | 35 |
| 28 | Geraldton | 1143.6 | 987.6 | 1132.2 | 35 | 15 | 33 |
| 29 | Hobart | 804.4 | 1001.6 | 792.1 | 1 | 17 | 1 |
| 30 | Alice Springs | 1058.6 | 872.3 | 1054.9 | 25 | 3 | 25 |
| 31 | Jabiru | 892.0 | 921.8 | 891.7 | 6 | 10 | 6 |
| 32 | Katherine | 976.5 | 894.3 | 983.5 | 15 | 7 | 16 |
| 33 | Aputula | 933.4 | 805.9 | 928.1 | 12 | 2 | 10 |
| 34 | Nhulunbuy | 917.0 | 890.5 | 926.3 | 10 | 6 | 9 |
| 35 | Tennant Creek | 1013.4 | 751.7 | 1051.0 | 21 | 1 | 24 |
| 36 | Darwin | 910.9 | 1011.0 | 933.1 | 8 | 18 | 12 |

**Table 21** ESTIMATES OF THE EIGENVECTORS FOR VARIABLES IN FOUR EXPERIMENTAL HEALTH INDEXES CONSTRUCTED USING HOSPITAL ADMINISTRATIVE SEPARATIONS DATA AND NATIONAL PERINATAL DATA

|  | Hospital separations data only | | Hospital separations data + NATSIS/AIHW-NPSU data | |
|---|---|---|---|---|
|  | Exclusion rules off | Exclusion rules on/a | Exclusion rules off | Exclusion rules on/a |
| *Eigenvalue* | *8.7819* | *8.7301* | *11.2255* | *10.3659* |
| *% of variation explained* | *51.7%* | *67.2%* | *31.2%* | *57.6%* |
| BEDDAYS | 0.0212 | ns | 0.0299 | ns |
| DIABETES | 0.2852 | 0.2874 | 0.2590 | 0.2680 |
| DIALYSIS | 0.0627 | ns | 0.0618 | ns |
| DIGESTIV | 0.2914 | 0.2947 | 0.2404 | 0.2611 |
| FEMSEPS | 0.2858 | 0.2827 | 0.2573 | 0.2634 |
| HOMICIDE | 0.3020 | 0.3020 | 0.2733 | 0.2823 |
| INJURY | 0.3244 | 0.3253 | 0.2863 | 0.2989 |
| ISCHAEM | 0.2002 | 0.2026 | 0.1527 | 0.1732 |
| MALESEPS | 0.2978 | 0.2957 | 0.2665 | 0.2747 |
| MENTAL | 0.2074 | 0.2097 | 0.1479 | 0.1752 |
| NUTRITN | 0.0481 | ns | 0.0764 | ns |
| PARASITE | 0.2892 | 0.2880 | 0.2647 | 0.2691 |
| POISON | 0.2421 | 0.2469 | 0.1785 | 0.2074 |
| PREGNANT | 0.2919 | 0.2938 | 0.2533 | 0.2681 |
| RESPIRAT | 0.3179 | 0.3179 | 0.2787 | 0.2897 |
| SEPMODE6 | -0.0032 | ns | 0.0097 | ns |
| SUICIDE | 0.2230 | 0.2234 | 0.1837 | 0.2022 |
| FETAL | not incl. | not incl. | 0.1596 | 0.1484 |
| NEONATAL | not incl. | not incl. | 0.0576 | ns |
| PERINAT | not incl. | not incl. | 0.1385 | 0.1218 |
| ARREST | not incl. | not incl. | 0.0463 | ns |
| VIOLENCE | not incl. | not incl. | 0.2400 | 0.2513 |
| ATTACK | not incl. | not incl. | -0.0550 | ns |
| ILL | not incl. | not incl. | -0.1611 | ns |
| SMOKE | not incl. | not incl. | -0.0121 | ns |
| SMOKE_M | not incl. | not incl. | 0.0877 | ns |
| SMOKE_F | not incl. | not incl. | -0.0983 | ns |
| ALCO | not incl. | not incl. | 0.2283 | 0.2394 |
| OBESE_P | not incl. | not incl. | 0.0639 | ns |
| OBESE_M | not incl. | not incl. | -0.0394 | ns |
| OBESE_F | not incl. | not incl. | 0.1056 | ns |
| DISTAH | not incl. | not incl. | -0.0059 | ns |
| HSERVICE | not incl. | not incl. | 0.0321 | ns |
| HPOOR | not incl. | not incl. | -0.0462 | ns |
| HDRUG | not incl. | not incl. | 0.0638 | ns |
| LOWBWGT | not incl. | not incl. | 0.1323 | 0.1263 |

ns. Not significant

a/ refres to dropping variables which do not have the right sign and do not contribute significantly.

# 6. CONCLUSION

244.   *A set of robust indexes:*   This study has demonstrated that it is feasible to construct indexes of socioeconomic disadvantage.  It has developed and tested nine different indexes at different levels of aggregation.  Eight of these indexes produce rankings of ATSIC regions which are reasonably consistent with each other, particularly if the 36 regions are grouped into quartiles.  The table below shows that while there is some change in rankings of ATSIC regions across the indexes, this change is typically quite small.  Regions do not change between quartiles, rather they move ranking within quartiles.  The general index based on Census only enable the user to rank both the ATSIC regions and the finer geography Indigenous areas.  However the Census only index includes only a few dimensions of Indigenous disadvantage.  The most comprehensive of these indexes is the one based on data from Census, NATSIS and national perinatal data.  However, this index only allows rankings to be developed at ATSIC region level.

245.   *The health index is problematic:*   The 9th index constructed is the health index based on hospital separations data.  The ranking based on the health index does not concur with the ranking of ATSIC regions from the other indexes.  At this stage it is suggested that this divergence between the health and the other indexes is not due intrinsic difference between health disadvantage and the other forms of disadvantage investigated in this report.  The divergence is due to the difference in the data sets used in the construction of the health index.

| Data source/index type | Torres Strait Area (QLD) | Narrogin (WA) | Brisbane (QLD) | Aputula (NT) |
|---|---|---|---|---|
| 1996 Census only | 27 | 13 | 5 | 36 |
| 1996 ABS Census + NATSIS + National perinatal data | 25 | 16 | 2 | 36 |
| Habitat | 27 | 15 | 4 | 35 |
| Economic | 23 | 14 | 3 | 36 |
| Housing and Infrastructure | 28 | 21 | 3 | 35 |
| Education | 17 | 13 | 2 | 36 |
| Employment | 23 | 16 | 2 | 35 |
| Health/a | 11 | 24 | 3 | 12 |

a/ Based on hospital data.

246.   *Areas for further research:*   The indexes discussed in this report are in their infancy.  They are experimental in nature and need refinement as new and more accurate data becomes available.  Possible avenues for future research include:

(i)  updating the indexes using the data to be generated from the 2001 Census; and

(ii)  finding better ways of capturing the health dimension of Indigenous disadvantage or better ways for modelling health disadvantage, possibly using theoretical models of economic and social deprivation.

**CONSULTANT'S REPORT**

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**COMMONWEALTH GRANTS COMMISSION**

**APPENDIXES**

**CONSULTANCY by**

**AUSTRALIAN BUREAU OF STATISTICS**

**2001**

# APPENDIX 1.  TERMS OF REFERENCE FOR THE ABS STUDY

Commonwealth Grants Commission
Cypress Court
5 Torrens Street
Canberra
ACT 2612

Australian Statistician
Australian Bureau of Statistics
P. O. Box 10
Belconnen, ACT 2616

Attention       Mr Ken Tallis
                Assistant Statistician
                Methodology Division

INDEX OF SOCIOECONOMIC DISADVANTAGE FOR INDIGENOUS PEOPLE

At a meeting of 23 February which discussed construction of an index of socioeconomic disadvantage for Indigenous people, Commission staff agreed to write to you setting out our requirements.

As you are aware, our interest in an index has been created by the Government asking the Commission to undertake an inquiry into matters relating to the funding of services for Indigenous peoples.  We have previously sent you an information paper setting out the scope and timing of the Inquiry.

We envisage an index of socioeconomic disadvantage for the Indigenous population providing us with a generalised measure of relative disadvantage.  In general, we might seek to use such an index:

      (i)  as a source of scene setting material; and

     (ii)  as a calibrating instrument against which the trends in the separate functional assessments could be checked

We do not propose to use it as an index of need for any of the functional areas targeted by the Inquiry.

The terms of reference for the Inquiry ask the Commission to undertake comparisons of need within the Indigenous population and to report by end of March 2001.  Hence some threshold requirement for an index of socioeconomic disadvantage would be that:

- it compares one Indigenous group (defined in geographic terms) with another rather than comparing the Indigenous population with Non-Indigenous population; and

- output should be available to be included in the Commission's report - this sets a date of early to mid December 2000 as the latest delivery date for a useable Index.

- However, the Commission has committed itself to producing a draft report in October 2000 and it would be desirable for indicative output to be available in September for inclusion in that report.

***In regard to some of the other issues discussed during the February meeting, we see the proposed index:***

- being a single index of socioeconomic disadvantage for the Indigenous population, rather than a series of separate indexes for the different dimensions of socioeconomic disadvantage; and

- using Indigenous Area, as defined by the ABS for the 1996 Census, as the basic geographical unit.  However, if this is not possible, ATSIC Regions would be an acceptable geographic unit.

In terms of coverage, the reference for the Commission's Inquiry ask it to provide separate details for Aboriginals and Torres Strait Islanders (including those Torres Strait Islanders living on the mainland).  Therefore the ideal would be to produce separate indexes for Aboriginals and for Torres Strait Islanders.  Your advice on whether the data would support that ideal would be appreciated.  If the data are not sufficient to support such a distinction, an index covering all Indigenous people would be acceptable.

At the February meeting, it was proposed that a first step towards production of an Index would be a feasibility study.  The Commission supports this approach and would be prepared to make a reasonable contribution to its cost.  If, after evaluation of the feasibility study's results, we agreed that derivation of an Index should proceed, we would also contribute to the reasonable costs of this exercise, subject to the amount involved, our budget constraints and the likely sales of the output.

Please let me know whether your Bureau can meet the Commission's time requirements and your estimate of the costs of the total project, and of the feasibility study in particular, as soon as possible.

For administrative matters concerning this proposed project, please contact Malcolm Nicholas on 02-6229-8814. If the project proceeds, our contact for technical matters will be Gautam Biswas who can be e-mailed at gautam.biswas@cgc.gov.au or telephoned on 02-6229 8889

R. J. Searle
Secretary
13 March 2000

# APPENDIX 2. LISTING OF VARIABLES CONSIDERED IN THE CONSTRUCTION OF INDIGENOUS DISADVANTAGE INDEXES

|   | SOURCE | VARIABLE NAME | BASIC UNIT | DESCRIPTION |
|---|---|---|---|---|
|   | Human capital | | | |
| 1 | CENSUS | NOQUAL | Individual | % of persons aged 15 and over with no post-school qualification |
| 2 | CENSUS | SHRTSCH | Individual | % of persons aged 15 and over who left school at age 15 or younger |
| 3 | CENSUS | NOSCH | Individual | Persons aged 15 and over who never went to school |
| 4 | CENSUS | PRFLUEN | Individual | % of persons aged 15 and over lacking English fluency |
| 5 | NATSIS | NATNOSCH | Individual | Proportion of persons aged 5-18 years who are not attending school |
| 6 | NATSIS | NOSCH16 | Individual | Proportion of persons aged 5-16 years who are not attending school |
| 7 | NATSIS | NOSCH18 | Individual | Proportion of persons aged 5-18 years who are not attending school |
| 8 | NATSIS | NOPOSTQ | Individual | Proportion of persons aged 15 years and over who had no post-school qualification |
| 9 | NATSIS | LEFTS10 | Individual | Proportion of persons aged 15 years and over who had left school below Year 10 |
| 10 | NATSIS | COMPYR12 | Individual | Proportion of persons that did not complete Yr12 |
| 11 | NATSIS | COMPYR10 | Individual | Proportion of persons that did not complete Yr10 |

|   | Family  structure | | | |
|---|---|---|---|---|
| 12 | CENSUS | SEPDIV | Individual | % of ever married persons aged 15 years and over who are now separated or divorced |
| 13 | CENSUS | ONEPARDP | Family | % of families which are sole-parent families |
| 14 | CENSUS | DEPRATIO | Individual | Dependency ratio |
| 15 | NATSIS | SOLEPEN | Individual | Proportion of persons aged 15 years and over who received sole parent pension |

| | | Income levels | | |
|---|---|---|---|---|
| 16 | CENSUS | FINCLO | Family | % of families whose income < $15,600 |
| 17 | CENSUS | FINCLOFF | Family | % of families (with offsprings) whose income < $15,600 |
| 18 | CENSUS | POVERHH | Individual | Poverty rate: household income (% of persons whose equivalised household income is below poverty line) |
| 19 | CENSUS | POVERFAM | Individual | Poverty rate: family income (% of persons whose equivalised family income is below poverty line) |
| 20 | CENSUS | POVERCHI | Individual | Poverty rate: child (% of children whose equivalised family income is below poverty line) |
| 21 | NATSIS | YGOVPAY | Individual | Proportion of persons aged 15 years and over whose main source of income is Government Payments |
| 22 | NATSIS | LOWINC | Individual | Proportion of persons aged 15 years and over whose annual income is $12,000 or less |

|  | Labour force status |  |  |  |
|----|----------|-----------|------------|------------------------------------------------------------------------------------------------------------------------------|
|  | Labour force status |  |  |  |
| 23 | CENSUS | M_UNEMP | Individual | % males in LF unemployed |
| 24 | CENSUS | F_UNEMP | Individual | % females in LF unemployed |
| 25 | CENSUS | P_UNEMP | Individual | % persons in LF unemployed |
| 26 | CENSUS | M_UNEMPP | Individual | % males aged 15 and over unemployed |
| 27 | CENSUS | F_UNEMPP | Individual | % females aged 15 and over unemployed |
| 28 | CENSUS | P_UNEMPP | Individual | % persons aged 15 and over unemployed |
| 29 | CENSUS | CDEP_E | Individual | CDEP as % of total employed |
| 30 | CENSUS | CDEP_LF | Individual | CDEP as % of total LF |
| 31 | CENSUS | CDEP_P | Individual | CDEP as % of total working age population |
| 32 | CENSUS | UNEMCDEP | Individual | % persons in LF unemployed + CDEP |
| 33 | CENSUS | NILF | Individual | % of working age persons not in the LF |
| 34 | NATSIS | NOTINLF | Individual | Proportion of persons aged 15 years and over who are not in the labour force |
| 35 | NATSIS | NOTINLFJ | Individual | Proportion of persons aged 15 years and over who are not in the labour force but wanted a job (Discouraged Workers) |
| 36 | NATSIS | UNEMPLYD | Individual | Proportion of persons aged 15 years and over who are unemployed |
| 37 | NATSIS | PARTEMP | Individual | Proportion of employed persons who worked less than 35 hours/week |
| 38 | NATSIS | ECDEP | Individual | Proportion of persons aged 15 years and over whose main source of income is CDEP |
| 39 | NATSIS | NOEMP | Dwelling | Proportion of households in which no one was working/employed |
| 40 | NATSIS | LTUENMP | Individual | Proportion of the unemployed 15 years and over who reported that the length of time that they had been unemployed was 12 months or more. |

|  | Employment in low paying occupations |  |  |  |
|----|----------|-----------|------------|------------------------------------------------------------------------------------------------------------------------------|
|  | Employment in low paying occupations |  |  |  |
| 41 | CENSUS | MLABOUR | Individual | % males aged 15 years and over classified as Labourers and Related Workers |
| 42 | CENSUS | FLABOUR | Individual | % females aged 15 years and over classified as Labourers and Related Workers |
| 43 | CENSUS | PLABOUR | Individual | % persons aged 15 years and over classified as Labourers and Related Workers |

| | Quality of housing | | | |
|---|---|---|---|---|
| 44 | CENSUS | GRENT | Dwelling | % of households renting (govt source) |
| 45 | CENSUS | NGRENT | Dwelling | % of households renting (private source) |
| 46 | CENSUS | CENSRENT | Dwelling | % of households renting (all sources) |
| 47 | CENSUS | FEWBED | Dwelling | % of occupied private dwellings (includes caravans in parks) with zero or one bedrooms. |
| 48 | CENSUS | MULTFAM | Dwelling | % of occupied dwellings with two or more families |
| 49 | CENSUS | PERFAM | Family | Number of persons per family |
| 50 | CENSUS | IMPDWEL | Dwelling | % households in improvised dwellings |
| 51 | CENSUS | BEDRATIO | Dwelling | % of households with a person/bedroom ratio of 3 or more |
| 52 | CENSUS | PERDWELL | Dwelling | Average number of persons per dwelling |
| 53 | NATSIS | AVEPHH | Dwelling | Average number of persons per Household |
| 54 | NATSIS | AVEPBR | Dwelling | Average number of persons per Bedroom |
| 55 | NATSIS | NATRENT | Dwelling | Proportion of households who are renting |
| 56 | NATSIS | UNSATD | Dwelling | Proportion of households who are not satisfied with current dwelling |
| 57 | NATSIS | HLIV | Dwelling | Proportion of unsatisfied households who reported that the main problem with dwelling is 'not enough living area' |
| 58 | NATSIS | HBED | Dwelling | Proportion of unsatisfied households who reported that the main problem with dwelling is 'not enough bedrooms' |
| 59 | NATSIS | HREPAIR | Dwelling | Proportion of unsatisfied households who reported that the main problem with dwelling is 'it needs repair' |
| 60 | NATSIS | HINSUL | Dwelling | Proportion of unsatisfied households who reported that the main problem with dwelling is 'it needs better insulation/ventilation' |
| 61 | NATSIS | HBATH | Dwelling | Proportion of unsatisfied households who reported that the main problem with dwelling is 'inadequate bathing facilities' |
| 62 | NATSIS | DELECTGAS | Dwelling | Proportion of unsatisfied households who reported that the main problem with dwelling is 'not having electricity or gas' |

| | Access to infrastructure and services | | | |
|---|---|---|---|---|
| 63 | CENSUS | NOCAR | Dwelling | %  occupied private dwellings with no registered motor vehicle |
| 64 | CENSUS | ARIA | Dwelling | Accessibility and remoteness index (0-12) |
| 65 | NATSIS | HWATER | Dwelling | Proportion of households with no  running water connected |
| 66 | NATSIS | ELECTR | Dwelling | Proportion of households with no electricity connected |
| 67 | NATSIS | NOGARB | Dwelling | Proportion of households that don't have garbage collection |
| 68 | NATSIS | UNSEALR | Dwelling | Proportion of households whose dwelling is situated in unsealed road |
| 69 | CHINS | DWATER | Dwelling | % of Permanent Dwellings in Discrete Communities not connected to Water Supply |
| 70 | CHINS | DELECT | Dwelling | % of Permanent Dwellings in Discrete Communities not connected to Electricity Supply |
| 71 | CHINS | DSEWERSEP | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is septic tanks |
| 72 | CHINS | DSEWERPIT | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is pit toilets |
| 73 | CHINS | DSEWERPAN | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is pan toilets |
| 74 | CHINS | DSEWEROTH | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is 'other type disposal system' |
| 75 | CHINS | DSEWERNO | Dwelling | % of Permanent Dwellings in Discrete Communities whose disposal system is 'no disposal system' |
| 76 | CHINS | DSEWEROFL | Dwelling | %. of Permanent Dwellings in Discrete Communities affected by overflows in last 12 months |
| 77 | CHINS | DDRAINPON | Dwelling | %  of Permanent Dwellings in Discrete Communities affected by ponding in last 12 months |
| 78 | CHINS | DTRANSUNS | Dwelling | % of Permanent Dwellings in Discrete Communities on unsealed roads |
| 79 | CHINS | CWATER | Communities | % of Discrete Communities where Main Source of Drinking Water: No Organised Supply (7) |
| 80 | CHINS | CELECT | Communities | % of Discrete Communities where Main Source of Electricity Supply: No Electricity (7) |
| 81 | CHINS | CSEWER | Communities | % of Discrete Communities where  Main Sewerage System: No Sewerage System |

| 82 | CHINS | CRUBBISH | Communities | % of Discrete Communities where Rubbish collection: No Organised Collection (2) |
| 83 | CHINS | CDISPRIM | Communities | % of Discrete Communities where Distance to nearest primary school: Greater than 50km |
| 84 | CHINS | CDISYR10 | Communities | % of Discrete Communities where Distance to nearest secondary school Yr10: Greater than 50km |
| 85 | CHINS | CDISYR12 | Communities | % of Discrete Communities where Distance to Nearest secondary school Yr12: Greater than 50km |
| 86 | CHINS | CDISFAID | Communities | % of Discrete Communities where Distance to nearest first aid clinic: Greater than 50km |
| 87 | CHINS | CDISHOSP | Communities | % of Discrete Communities where Distance of nearest hospital Greater than 50km |
| 88 | CHINS | CDISCENT | Communities | % of Discrete Communities where Distance of nearest  health centre Greater than 50km |
| 89 | CHINS | CDISCHEM | Communities | % of Discrete Communities where Distance of nearest chemist Greater than 50km |
| 90 | CHINS | FWORKER | Communities | % of Discrete Communities where Frequency of access to a <br> Male Indigenous Health Worker: Less than three monthly |
| 91 | CHINS | MWOKER | Communities | % of Discrete Communities where Frequency of access to a Female Indigenous  Health Worker: Less than three monthly |
| 92 | CHINS | PWATER | Individual | % of Persons in  AREG Discrete Communities where  Main Source of Drinking Water: No Organised Supply (7) |
| 93 | CHINS | PELECT | Individual | % of Persons in AREG Discrete Communities where  Main Source of Electricity Supply: No Electricity (7) |
| 94 | CHINS | PSEWER | Individual | % of Persons in AREG Discrete Communities where Main Sewerage System: No Sewerage System |
| 95 | CHINS | PRUBBISH | Individual | % of Persons in AREG Discrete Communities where Rubbish Collection: No Organised Collection (2) |
| 96 | CHINS | PDISPRIM | Individual | % of Persons in AREG Discrete Communities where Distance to nearest primary school: Greater than 50km |
| 97 | CHINS | PDISYR10 | Individual | % of Persons in AREG Discrete Communities where Distance to nearest secondary school Yr10: Greater than 50km |
| 98 | CHINS | PDISYR12 | Individual | % of Persons in AREG Discrete Communities where Distance to nearest secondary school Yr12: Greater than 50km |
| 99 | CHINS | PDISFAID | Individual | % of Persons in AREG Discrete Communities where distance to nearest first aid clinic: Greater than 50km |

|     |           | Health   |            |                                                                                                              |
| --- | --------- | -------- | ---------- | ------------------------------------------------------------------------------------------------------------ |
| 100 | NATSIS    | ILL      | Individual | Proportion of persons who experienced long-term illness (6 months or over)                                   |
| 101 | NATSIS    | ALCO     | Individual | Proportion of persons aged 13 years and over who perceived alcohol to be main local health problem           |
| 102 | NATSIS    | HDRUG    | Individual | Proportion of persons aged 13 years and over who perceived drugs/substances to be main local health problem  |
| 103 | NATSIS    | SMOKE    | Individual | Proportion of persons aged 13 years and over who are smokers                                                  |
| 104 | NATSIS    | HPOOR    | Individual | Proportions of persons who self-assessed their health as 'poor'                                               |
| 105 | NATSIS    | HSERVICE | Individual | Proportion of persons aged 13 years and over who are 'not happy with local health services'                  |
| 106 | NATSIS    | DISTAS   | Dwelling   | Proportion of Year 10 students that travelled more than 25km to School                                        |
| 107 | NATSIS    | DISTAH   | Dwelling   | Proportion of households who had to travel 'more than 10 kilometers' to attend the nearest health centre     |
| 108 | NATSIS    | WEIGHTH  | Individual | Proportion of persons aged 18 years and over (who have their weight and height measurements taken) who were either underweight, overweight or obese. |
| 109 | NATSIS    | DISAB    | Individual | Proportion of persons aged 15 years and over who received disability support allowance                       |
| 110 | AIHW/NPSU | FETAL    | Individual | Fetal deaths as % of all births                                                                              |
| 111 | AIHW/NPSU | NEONATAL | Individual | Neonatal deaths as % of all births                                                                           |
| 112 | AIHW/NPSU | PERINAT  | Individual | Perinatal deaths as % of all births                                                                          |
| 113 | AIHW/NPSU | FETRATE  | Individual | Fetal deaths (rate per 1000 births)                                                                          |
| 114 | AIHW/NPSU | NEORATE  | Individual | Neonatal deaths (rate per 1000 births)                                                                       |
| 115 | AIHW/NPSU | PERIRATE | Individual | Perinatal deaths (rate per 1000 births)                                                                      |
| 116 | AIHW/NPSU | LOWBWGT  | Individual | Low birthweight babies (<2.5kg, live births)                                                                 |

|     |        | Other indicators |            |                                                                                                              |
| --- | ------ | ---------------- | ---------- | ------------------------------------------------------------------------------------------------------------ |
| 117 | NATSIS | ATTACK           | Individual | Proportion of persons aged 13 years and over who had been assaulted or attacked in last five years           |
| 118 | NATSIS | ARREST           | Individual | Proportion of persons aged 13 years and over who had been arrested in last five years                        |
| 119 | NATSIS | VIOLENCE         | Individual | Proportion of persons aged 13 years and over who perceived family violence as a problem in local area        |

# APPENDIX 3.  PRINCIPAL COMPONENT ANALYSIS: SAS OUTPUT

247.    PCA is a technique that reduces a large number of related variables to a new set of (uncorrelated) components, which are ordered so that the first few components explain most of the variation present in the original variables.  A correlation or covariance matrix of the explanatory variables is analysed, in order to extract the underlying factors or components from them.  The first principal component is the linear combination of the variables that has the highest possible variance.  A second principal component is then found such that it has the highest possible variation of any linear combination of the variables, yet is orthogonal to the first component.  There is as many components as variables, though often much of the variability of the system can be accounted for by just a few components (usually the first).

248.    The technique was used on the variables found to be statistically relevant and significant for the disadvantage index, using either 36 observations (ATSIC Region level analysis) or 684 observations (IARE level analysis).  The correlation rather than the covariance matrix was adopted for the PCA, as the variables had differing ranges and standard deviations.  (When the PCA was run on the covariance matrix, the weights were dominated by variables which had large range and standard deviation (e.g. CDEP and MLABOUR)).  The purpose of using the correlation matrix is to standardise each of the variables to give them the same range and standard deviation.  This compensates for the problem of one variable dominating the weight of the first principal component.  When the correlation matrix was used, an evenly distributed weights (eigenvectors) were obtained.

249.    The SAS output after running PCA are shown in the following tables.

**Table A3-1** SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF AN
EXPERIMENTAL GENERAL INDEX OF INDIGENOUS
SOCIOECONOMIC DISADVANTAGE: ABS 1996 CENSUS (REFINED)

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 9.3775 | . | 0.7213 | 0.7213 |

| Eigenvectors (CORR) | |
|---|---|
| Variable | PCR1 |
| NOQUAL | 0.2982 |
| NOSCH | 0.2638 |
| MLABOUR | 0.2988 |
| FLABOUR | 0.3040 |
| UNEMCDEP | 0.3079 |
| NILF | 0.1476 |
| PRFLUEN | 0.2781 |
| POVHH | 0.3004 |
| CENSRENT | 0.1518 |
| NOCAR | 0.2846 |
| MULTFAM | 0.3062 |
| IMPDWELL | 0.2818 |
| BEDRATIO | 0.3138 |

| Pattern Matrix (CORR) | |
|---|---|
| Variable | PCR1 |
| NOQUAL | 0.9131 |
| NOSCH | 0.8078 |
| MLABOUR | 0.9151 |
| FLABOUR | 0.9309 |
| UNEMCDEP | 0.9428 |
| NILF | 0.4519 |
| PRFLUEN | 0.8515 |
| POVHH | 0.9201 |
| CENSRENT | 0.4647 |
| NOCAR | 0.8714 |
| MULTFAM | 0.9377 |
| IMPDWELL | 0.8629 |
| BEDRATIO | 0.9608 |

**Table A3-2** SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF AN INDEX BASED ON 1996 CENSUS PLUS OTHER DATA SETS

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 16.8027 | . | 0.4942 | 0.4942 |

| Eigenvectors (CORR) | | Pattern Matrix (CORR) | |
|---|---|---|---|
| Variable | PCR1 | Variable | PCR1 |
| NOQUAL | 0.2156 | NOQUAL | 0.8836 |
| NOSCH | 0.1922 | NOSCH | 0.7880 |
| MLABOUR | 0.2220 | MLABOUR | 0.9099 |
| FLABOUR | 0.2219 | FLABOUR | 0.9095 |
| UNEMCDEP | 0.2270 | UNEMCDEP | 0.9304 |
| NILF | 0.1026 | NILF | 0.4207 |
| PRFLUEN | 0.2014 | PRFLUEN | 0.8257 |
| POVHH | 0.2224 | POVHH | 0.9116 |
| CENSRENT | 0.1029 | CENSRENT | 0.4219 |
| NOCAR | 0.2113 | NOCAR | 0.8661 |
| MULTFAM | 0.2240 | MULTFAM | 0.9181 |
| IMPDWELL | 0.2068 | IMPDWELL | 0.8476 |
| BEDRATIO | 0.2286 | BEDRATIO | 0.9371 |
| HWATER | 0.1514 | HWATER | 0.6208 |
| ELECTGAS | 0.1758 | ELECTGAS | 0.7205 |
| NOGARB | 0.1188 | NOGARB | 0.4871 |
| UNSATD | 0.2092 | UNSATD | 0.8573 |
| HLIV | 0.1302 | HLIV | 0.5339 |
| HBED | 0.1252 | HBED | 0.5132 |
| HREPAIR | 0.1271 | HREPAIR | 0.5208 |
| HINSUL | 0.1283 | HINSUL | 0.5258 |
| HBATH | 0.1708 | HBATH | 0.7000 |
| NOSCH16 | 0.1820 | NOSCH16 | 0.7459 |
| LEFTS10 | 0.1669 | LEFTS10 | 0.6843 |
| DISTAS | 0.1612 | DISTAS | 0.6609 |
| PARTEMP | 0.1839 | PARTEMP | 0.7538 |
| LOWINC | 0.1823 | LOWINC | 0.7471 |
| VIOLENCE | 0.0949 | VIOLENCE | 0.3892 |
| ALCO | 0.0474 | ALCO | 0.1943 |
| SMOKE_M | 0.1194 | SMOKE_M | 0.4895 |
| FETAL | 0.1500 | FETAL | 0.6150 |
| NEONATAL | 0.1169 | NEONATAL | 0.4793 |
| PERINAT | 0.1589 | PERINAT | 0.6513 |
| LOWBWGT | 0.1361 | LOWBWGT | 0.5580 |

**Table A3-3**   SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF THE
HABITAT INDEX

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 9.2262 | . | 0.4393 | 0.4393 |

| Eigenvectors (CORR) | |
|---|---|
| Variable | PCR1 |
| IMPDWELL | 0.2762 |
| BEDRATIO | 0.2931 |
| CENSRENT | 0.1142 |
| NOCAR | 0.2825 |
| MULTFAM | 0.2937 |
| ALCO | 0.0482 |
| SMOKE_M | 0.1715 |
| DELECTGA | 0.2116 |
| UNSATD | 0.2837 |
| HWATER | 0.1768 |
| NOGARB | 0.1619 |
| HBED | 0.2181 |
| HREPAIR | 0.2241 |
| HBATH | 0.2707 |
| HLIV | 0.2260 |
| HINSUL | 0.2052 |
| VIOLENCE | 0.1249 |
| FETAL | 0.2086 |
| NEONATAL | 0.1785 |
| PERINAT | 0.2266 |
| LOWBWGT | 0.1939 |

| Pattern Matrix (CORR) | |
|---|---|
| Variable | PCR1 |
| IMPDWELL | 0.8388 |
| BEDRATIO | 0.8902 |
| CENSRENT | 0.3469 |
| NOCAR | 0.8582 |
| MULTFAM | 0.8921 |
| ALCO | 0.1463 |
| SMOKE_M | 0.5208 |
| DELECTGA | 0.6429 |
| UNSATD | 0.8617 |
| HWATER | 0.5370 |
| NOGARB | 0.4918 |
| HBED | 0.6625 |
| HREPAIR | 0.6808 |
| HBATH | 0.8223 |
| HLIV | 0.6866 |
| HINSUL | 0.6234 |
| VIOLENCE | 0.3795 |
| FETAL | 0.6338 |
| NEONATAL | 0.5422 |
| PERINAT | 0.6883 |
| LOWBWGT | 0.5889 |

**Table A3-4**   SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF THE
HABITAT INDEX

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 9.6636 | . | 0.6442 | 0.6442 |

| Eigenvectors (CORR) | |
|---|---|
| Variable | PCR1 |
| NOCAR | 0.2700 |
| CENSRENT | 0.1564 |
| NOQUAL | 0.2945 |
| NOSCH | 0.2692 |
| MLABOUR | 0.2943 |
| FLABOUR | 0.2930 |
| UNEMCDEP | 0.3026 |
| NILF | 0.1357 |
| PRFLUEN | 0.2700 |
| POVHH | 0.2980 |
| NOSCH16 | 0.2467 |
| LEFTS10 | 0.2406 |
| DISTAS | 0.2105 |
| PARTEMP | 0.2637 |
| LOWINC | 0.2581 |

| Pattern Matrix (CORR) | |
|---|---|
| Variable | PCR1 |
| NOCAR | 0.8393 |
| CENSRENT | 0.4860 |
| NOQUAL | 0.9156 |
| NOSCH | 0.8370 |
| MLABOUR | 0.9150 |
| FLABOUR | 0.9109 |
| UNEMCDEP | 0.9407 |
| NILF | 0.4219 |
| PRFLUEN | 0.8393 |
| POVHH | 0.9263 |
| NOSCH16 | 0.7670 |
| LEFTS10 | 0.7480 |
| DISTAS | 0.6544 |
| PARTEMP | 0.8198 |
| LOWINC | 0.8023 |

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**Table A3-5**    SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF THE HOUSING AND INFRASTRUCTURE INDEX

| ≫ | Eigenvalues (CORR) | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 7.7215 | . | 0.5515 | 0.5515 |

| ≫ Eigenvectors (CORR) | |
|---|---|
| Variable | PCR1 |
| HINSUL | 0.2624 |
| IMPDWELL | 0.2992 |
| NOCAR | 0.3030 |
| BEDRATIO | 0.3085 |
| MULTFAM | 0.3075 |
| CENSRENT | 0.0806 |
| NOGARB | 0.1851 |
| UNSATD | 0.3188 |
| HWATER | 0.2120 |
| ELECTGAS | 0.2517 |
| HBED | 0.2573 |
| HREPAIR | 0.2677 |
| HBATH | 0.3084 |
| HLIV | 0.2763 |

| ≫ Pattern Matrix (CORR) | |
|---|---|
| Variable | PCR1 |
| HINSUL | 0.7292 |
| IMPDWELL | 0.8313 |
| NOCAR | 0.8421 |
| BEDRATIO | 0.8571 |
| MULTFAM | 0.8546 |
| CENSRENT | 0.2240 |
| NOGARB | 0.5144 |
| UNSATD | 0.8858 |
| HWATER | 0.5892 |
| ELECTGAS | 0.6994 |
| HBED | 0.7151 |
| HREPAIR | 0.7439 |
| HBATH | 0.8569 |
| HLIV | 0.7679 |

**Table A3-6**   SIX SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF THE
EDUCATION INDEX

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 4.1804 | . | 0.6967 | 0.6967 |

| Eigenvectors (CORR) | |
|---|---|
| Variable | PCR1 |
| NOQUAL | 0.4106 |
| NOSCH | 0.4252 |
| PRFLUEN | 0.4319 |
| NOSCH16 | 0.4229 |
| LEFTS10 | 0.3970 |
| DISTAS | 0.3573 |

| Pattern Matrix (CORR) | |
|---|---|
| Variable | PCR1 |
| NOQUAL | 0.8396 |
| NOSCH | 0.8694 |
| PRFLUEN | 0.8830 |
| NOSCH16 | 0.8646 |
| LEFTS10 | 0.8117 |
| DISTAS | 0.7306 |

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**Table A3-7**    SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF AN
INDEX BASED ON THE EMPLOYMENT AND INCOME INDEX

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 5.8269 | . | 0.6474 | 0.6474 |

| Eigenvectors (CORR) | |
|---|---|
| Variable | PCR1 |
| FLABOUR | 0.3869 |
| MLABOUR | 0.3914 |
| UNEMCDEP | 0.3974 |
| NILF | 0.1247 |
| POVHH | 0.3847 |
| PARTEMP | 0.3569 |
| ECDEP | 0.3705 |
| LOWINC | 0.3272 |
| ARREST | 0.0620 |

| Pattern Matrix (CORR) | |
|---|---|
| Variable | PCR1 |
| FLABOUR | 0.9339 |
| MLABOUR | 0.9449 |
| UNEMCDEP | 0.9594 |
| NILF | 0.3009 |
| POVHH | 0.9287 |
| PARTEMP | 0.8616 |
| ECDEP | 0.8944 |
| LOWINC | 0.7899 |
| ARREST | 0.1496 |

**Table A3-8**    SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF THE ACCESSIBLE AREAS INDEX

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 5.7581 | . | 0.3839 | 0.3839 |

| Eigenvectors (CORR) | |
|---|---|
| Variable | PCR1 |
| FLABOUR | 0.1108 |
| MLABOUR | 0.2165 |
| MULTFAM | 0.1809 |
| NOCAR | 0.2771 |
| NOQUAL | 0.3227 |
| UNEMCDEP | 0.3558 |
| SHRTSCH | 0.2411 |
| M_UNEMP | 0.3118 |
| F_UNEMP | 0.2811 |
| DEPRATIO | 0.1791 |
| NILF | 0.3352 |
| ONEPARDP | 0.2314 |
| POVHH | 0.2825 |
| CENSRENT | 0.2579 |
| BEDRATIO | 0.1480 |

| Pattern Matrix (CORR) | |
|---|---|
| Variable | PCR1 |
| FLABOUR | 0.2659 |
| MLABOUR | 0.5195 |
| MULTFAM | 0.4341 |
| NOCAR | 0.6650 |
| NOQUAL | 0.7744 |
| UNEMCDEP | 0.8538 |
| SHRTSCH | 0.5786 |
| M_UNEMP | 0.7482 |
| F_UNEMP | 0.6745 |
| DEPRATIO | 0.4298 |
| NILF | 0.8044 |
| ONEPARDP | 0.5553 |
| POVHH | 0.6780 |
| CENSRENT | 0.6188 |
| BEDRATIO | 0.3551 |

**Table A3-9**    SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF THE INDEX:  MODERATELY ACCESSIBLE AREAS

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 4.3596 | . | 0.3114 | 0.3114 |

| Eigenvectors (CORR) | |
|---|---|
| Variable | PCR1 |
| IMPDWELL | 0.1127 |
| FLABOUR | 0.2170 |
| MLABOUR | 0.2476 |
| MULTFAM | 0.4046 |
| NOCAR | 0.4058 |
| NOQUAL | 0.3260 |
| NOSCH | 0.1201 |
| PRFLUEN | 0.1726 |
| NILF | 0.1964 |
| ONEPARDP | 0.2230 |
| UNEMCDEP | 0.3090 |
| POVHH | 0.1508 |
| CENSRENT | 0.2371 |
| BEDRATIO | 0.3706 |

| Pattern Matrix (CORR) | |
|---|---|
| Variable | PCR1 |
| IMPDWELL | 0.2352 |
| FLABOUR | 0.4531 |
| MLABOUR | 0.5170 |
| MULTFAM | 0.8447 |
| NOCAR | 0.8472 |
| NOQUAL | 0.6806 |
| NOSCH | 0.2508 |
| PRFLUEN | 0.3604 |
| NILF | 0.4100 |
| ONEPARDP | 0.4655 |
| UNEMCDEP | 0.6453 |
| POVHH | 0.3149 |
| CENSRENT | 0.4952 |
| BEDRATIO | 0.7739 |

**Table A3-10**   SELECTED SAS OUTPUTS FROM THE CONSTRUCTION OF THE REMOTE INDEX

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 3.8605 | . | 0.3510 | 0.3510 |

| Eigenvectors (CORR) | |
|---|---|
| Variable | PCR1 |
| IMPDWELL | 0.1575 |
| FLABOUR | 0.2963 |
| MLABOUR | 0.3315 |
| MULTFAM | 0.3608 |
| NOCAR | 0.2994 |
| NOQUAL | 0.2625 |
| NOSCH | 0.2799 |
| PRFLUEN | 0.2912 |
| UNEMCDEP | 0.3756 |
| POVHH | 0.2865 |
| BEDRATIO | 0.3203 |

| Pattern Matrix (CORR) | |
|---|---|
| Variable | PCR1 |
| IMPDWELL | 0.3094 |
| FLABOUR | 0.5821 |
| MLABOUR | 0.6513 |
| MULTFAM | 0.7089 |
| NOCAR | 0.5882 |
| NOQUAL | 0.5157 |
| NOSCH | 0.5500 |
| PRFLUEN | 0.5722 |
| UNEMCDEP | 0.7379 |
| POVHH | 0.5629 |
| BEDRATIO | 0.6293 |

## APPENDIX 4:  LISTING OF INDIGENOUS AREAS IN ORDER OF DISADVANTAGE BASED ON DATA FROM 1996 CENSUS ONLY

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Manningham (C)/Nillumbik (S) | 7 | Wangarata | 872.51 | 1 |
| Baulkham Hills (A) | 4 | Sydney | 880.02 | 2 |
| Hornsby-Ku-ring-gai | 4 | Sydney | 882.47 | 3 |
| Penrith: Emu Plains | 4 | Sydney | 883.07 | 4 |
| Blue Mountains (C): Balance | 4 | Sydney | 885.39 | 5 |
| Wanneroo (C): Central Coastal | 20 | Perth | 885.91 | 6 |
| Lower Northern Sydney | 4 | Sydney | 886.77 | 7 |
| Sth Loddon-E. Central Highlands | 8 | Ballarat | 889.21 | 8 |
| Tuggeranong/ACT Balance | 1 | Queanbeyan | 889.21 | 9 |
| Happy Valley (C)/Mitcham (C) | 17 | Adelaide | 889.65 | 10 |
| South Melbourne | 7 | Wangarata | 889.86 | 11 |
| Wanneroo (C): South-West | 20 | Perth | 890.16 | 12 |
| Rockdale (C) | 4 | Sydney | 893.25 | 13 |
| Tea Tree Gully (C) | 17 | Adelaide | 893.98 | 14 |
| Sutherland Shire (A) | 4 | Sydney | 894.12 | 15 |
| Northern Beaches | 4 | Sydney | 896.29 | 16 |
| Waverley (A)/Woollahra (A) | 4 | Sydney | 896.35 | 17 |
| Hobart (C) | 29 | Hobart | 896.70 | 18 |
| Monash (C) | 7 | Wangarata | 897.09 | 19 |
| Whitehorse (C) | 7 | Wangarata | 897.36 | 20 |
| Central Coast (M) | 29 | Hobart | 897.47 | 21 |
| Cook (S) - Weipa only SLA | 12 | Cooktown | 897.56 | 22 |
| Yarra Ranges (S) | 7 | Wangarata | 897.98 | 23 |
| N Canberra/Belconnen/Gungahlin | 1 | Queanbeyan | 898.50 | 24 |
| Wollondilly (A) | 4 | Sydney | 898.55 | 25 |
| Casey (C) | 7 | Wangarata | 899.27 | 26 |
| Knox (C) | 7 | Wangarata | 899.52 | 27 |
| West Tamar (M)/Latrobe (M) | 29 | Hobart | 900.80 | 28 |
| Moonee Valley (C) | 8 | Ballarat | 900.90 | 29 |
| Maroondah (C) | 7 | Wangarata | 901.08 | 30 |
| Barwon | 8 | Ballarat | 901.25 | 31 |
| Inner Western Sydney | 4 | Sydney | 901.50 | 32 |
| Wanneroo (C): North-West | 20 | Perth | 902.24 | 33 |
| Penrith: St Clair | 4 | Sydney | 902.47 | 34 |
| Blue Mountains (C): Hazelbrook | 4 | Sydney | 903.90 | 35 |
| Camden (A) | 4 | Sydney | 904.23 | 36 |
| Eastern Adelaide | 17 | Adelaide | 904.72 | 37 |
| Kiama (A) | 4 | Sydney | 905.13 | 38 |
| Ipswich (C): Balance | 9 | Brisbane | 905.17 | 39 |
| Byron (A) | 3 | Coffs Harbour | 905.20 | 40 |
| Logan: Logan City balance | 9 | Brisbane | 905.95 | 41 |
| South Gippsland-Cardinia (S) | 7 | Wangarata | 906.61 | 42 |
| Pine Rivers Shire | 9 | Brisbane | 906.63 | 43 |
| Blacktown (C): Plmptn/Glendg/Rooty | 4 | Sydney | 906.65 | 44 |
| Redland: Redland Shire balance | 9 | Brisbane | 906.65 | 45 |
| Kingoborough (M) | 29 | Hobart | 906.74 | 46 |
| Mitchell (S)-South Goulburn | 7 | Wangarata | 907.05 | 47 |
| Ryde (C)/Hunter's Hill (A) | 4 | Sydney | 907.15 | 48 |
| Hurstville (C) | 4 | Sydney | 907.26 | 49 |
| Banyule (C) | 7 | Wangarata | 907.89 | 50 |
| Kogarah (A) | 4 | Sydney | 907.98 | 51 |
| Hobsons Bay (C) | 8 | Ballarat | 908.03 | 52 |
| Hawkesbury (C): Balance | 4 | Sydney | 908.10 | 53 |
| Devonport (C) | 29 | Hobart | 909.47 | 54 |
| Kalamunda (S) | 20 | Perth | 909.65 | 55 |
| Meander Valley (M)/Kentish (M) | 29 | Hobart | 909.72 | 56 |
| Western Tasmania | 29 | Hobart | 910.04 | 57 |
| Campbelltown: Balance | 4 | Sydney | 910.59 | 58 |
| Ovens-Murray | 7 | Wangarata | 910.73 | 59 |
| Blacktown (C):Quakers Hill/M'yong | 4 | Sydney | 910.80 | 60 |
| Beaudesert & Boonah | 9 | Brisbane | 910.82 | 61 |
| Cairns (C): Northern Suburbs SLA | 10 | Cairns | 910.97 | 62 |
| Rosalie (S)/Crow's Nest (S) | 14 | Roma | 911.12 | 63 |
| Nhulunbuy (T) | 34 | Nhulunbuy | 911.31 | 64 |

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|------|-----------|-------------------|--------------------|---------------------------------------------|
| Marrara/City Rem/Winnellie | 36 | Darwin | 911.35 | 65 |
| St Kilda/Prahran/Richmond | 7 | Wangarata | 911.67 | 66 |
| Gosford (C) | 3 | Coffs Harbour | 911.69 | 67 |
| Southern Tablelands | 1 | Queanbeyan | 911.81 | 68 |
| Brisbane: Western Outer | 9 | Brisbane | 912.01 | 69 |
| Mornington P'sula (S) | 7 | Wangarata | 912.12 | 70 |
| Frankston (C) | 7 | Wangarata | 912.66 | 71 |
| Cessnock: Cessnock-Bellbird | 3 | Coffs Harbour | 913.33 | 72 |
| Woden/Weston/South Canberra | 1 | Queanbeyan | 913.38 | 73 |
| Albany (S) | 24 | Narrogin | 913.38 | 74 |
| Penrith: Inner | 4 | Sydney | 914.34 | 75 |
| Fleurieu p'sula/Adelaide Hills | 17 | Adelaide | 914.46 | 76 |
| Alawa/Brinkin/Nakara | 36 | Darwin | 914.81 | 77 |
| Glenorchy (C) | 29 | Hobart | 915.40 | 78 |
| Rockingham (C) | 20 | Perth | 916.08 | 79 |
| Parry (A)/Nundle (A) | 5 | Tamworth | 916.32 | 80 |
| Blacktown (C): Eastern Ck/M'bury | 4 | Sydney | 916.33 | 81 |
| Noosa Shire | 9 | Brisbane | 917.05 | 82 |
| Clarence (C) | 29 | Hobart | 917.13 | 83 |
| Central Metropolitan | 20 | Perth | 917.13 | 84 |
| Tweed Pt B | 3 | Coffs Harbour | 917.23 | 85 |
| Anula/Wulagi | 36 | Darwin | 917.23 | 86 |
| Wodonga (RC) | 7 | Wangarata | 917.45 | 87 |
| Penrith: Balance | 4 | Sydney | 917.86 | 88 |
| Marion (C) | 17 | Adelaide | 917.94 | 89 |
| Eastern Tasmania | 29 | Hobart | 917.94 | 90 |
| Greater Lithgow (C) | 6 | Wagga Wagga | 917.98 | 91 |
| Temora /Coolamon /Bland | 6 | Wagga Wagga | 918.19 | 92 |
| Burnie (C) | 29 | Hobart | 918.22 | 93 |
| Greater Geelong/Queenscliffe | 8 | Ballarat | 918.42 | 94 |
| Huon Valley (M) | 29 | Hobart | 918.47 | 95 |
| Karama | 36 | Darwin | 918.48 | 96 |
| Kingston (C) | 7 | Wangarata | 918.57 | 97 |
| North Goulburn | 7 | Wangarata | 918.78 | 98 |
| Cairns (C): Western Suburbs SLA | 10 | Cairns | 918.79 | 99 |
| West Adelaide | 17 | Adelaide | 919.07 | 100 |
| Cairns (C): Edmonton | 10 | Cairns | 919.11 | 101 |
| Brimbank (C) | 8 | Ballarat | 919.18 | 102 |
| Noarlunga (C) & Willunga (DC) | 17 | Adelaide | 919.40 | 103 |
| Brisbane: Eastern Inner | 9 | Brisbane | 919.44 | 104 |
| Melville (C) | 20 | Perth | 919.64 | 105 |
| Brisbane: Southern Outer | 9 | Brisbane | 919.67 | 106 |
| Mid North/Barossa | 17 | Adelaide | 919.74 | 107 |
| Wyndham (C) | 8 | Ballarat | 919.82 | 108 |
| Logan: Marsden SLA | 9 | Brisbane | 920.12 | 109 |
| Broadsound/Belyando/Peak Downs | 13 | Rockhampton | 920.33 | 110 |
| Randwick (C): Balance | 4 | Sydney | 920.43 | 111 |
| Brisbane: Northern Inner | 9 | Brisbane | 920.55 | 112 |
| Central Tasmania | 29 | Hobart | 920.57 | 113 |
| Moreland (C) | 8 | Ballarat | 920.61 | 114 |
| Blue Mountains (C): Katoomba | 4 | Sydney | 920.71 | 115 |
| Brisbane: Western Inner | 9 | Brisbane | 920.73 | 116 |
| Penrith: Kingswood/Werrington | 4 | Sydney | 920.86 | 117 |
| Holroyd (C) | 4 | Sydney | 921.52 | 118 |
| Brisbane: Northern Outer | 9 | Brisbane | 921.59 | 119 |
| Mundaring (S) | 20 | Perth | 921.70 | 120 |
| Hastings (A) | 3 | Coffs Harbour | 921.76 | 121 |
| Brisbane: Southern Inner | 9 | Brisbane | 921.84 | 122 |
| Whittlesea (C) | 8 | Ballarat | 921.98 | 123 |
| Stirling (C): South-Eastern | 20 | Perth | 922.12 | 124 |
| Hume (C) | 8 | Ballarat | 922.87 | 125 |
| W. Central Highlands-Hopkins | 8 | Ballarat | 923.35 | 126 |
| Fitzroy (S) | 13 | Rockhampton | 923.66 | 127 |
| Gold Coast City Pt B | 9 | Brisbane | 923.69 | 128 |
| Wyong (A) | 3 | Coffs Harbour | 923.73 | 129 |
| South Preston | 24 | Narrogin | 924.03 | 130 |

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Northeast Tasmania | 29 | Hobart | 924.60 | 131 |
| Millner/Jingili | 36 | Darwin | 924.74 | 132 |
| Wollongong (C) | 4 | Sydney | 924.82 | 133 |
| Shoalhaven: Balance | 1 | Queanbeyan | 924.90 | 134 |
| Port Phillip/Melbourne | 8 | Ballarat | 925.02 | 135 |
| Maroochy Shire | 9 | Brisbane | 925.16 | 136 |
| Launceston (C) | 29 | Hobart | 925.66 | 137 |
| Auburn (A) | 4 | Sydney | 925.69 | 138 |
| Caboolture Shire | 9 | Brisbane | 925.74 | 139 |
| Greater Bendigo (C) | 8 | Ballarat | 925.79 | 140 |
| Goulburn (C) | 1 | Queanbeyan | 925.88 | 141 |
| Bankstown (C) | 4 | Sydney | 925.94 | 142 |
| Port Adelaide (C) | 17 | Adelaide | 926.23 | 143 |
| Salisbury (C) | 17 | Adelaide | 926.46 | 144 |
| Cairns (C): Mt Whitfield SLA | 10 | Cairns | 926.55 | 145 |
| Lake Macquarie (C) | 3 | Coffs Harbour | 926.60 | 146 |
| Ashfield (A) | 4 | Sydney | 927.03 | 147 |
| Pt Stephens: Balance | 3 | Coffs Harbour | 927.04 | 148 |
| Penrith: St Marys/Colyton | 4 | Sydney | 927.38 | 149 |
| Wingecaribee (A) | 1 | Queanbeyan | 927.40 | 150 |
| Cessnock: Balance | 3 | Coffs Harbour | 927.58 | 151 |
| Alyangula/Bal Groote | 34 | Nhulunbuy | 927.68 | 152 |
| Manjimup (S)/Denmark (S) | 24 | Narrogin | 928.13 | 153 |
| Darwin/Inner Suburbs | 36 | Darwin | 928.44 | 154 |
| Malak | 36 | Darwin | 928.90 | 155 |
| Tiwi/Wanguri/Lee Point/Leanyer | 36 | Darwin | 929.17 | 156 |
| Blacktown (C): Lalor Pk/KLang/P'lea | 4 | Sydney | 929.35 | 157 |
| Cairns (C): White Rock | 10 | Cairns | 929.55 | 158 |
| Coffs Harbour (A): Balance | 3 | Coffs Harbour | 929.90 | 159 |
| Warrnambool (C) | 8 | Ballarat | 929.91 | 160 |
| Campbelltown: Raby-Claymore | 4 | Sydney | 930.02 | 161 |
| Singleton (A) | 3 | Coffs Harbour | 930.61 | 162 |
| Bayswater (C) | 20 | Perth | 930.62 | 163 |
| Fairfield (C) | 4 | Sydney | 930.82 | 164 |
| Parramatta (C) | 4 | Sydney | 930.87 | 165 |
| Moil/Wagaman | 36 | Darwin | 931.21 | 166 |
| Sydney (C) | 4 | Sydney | 931.45 | 167 |
| Great Lakes: Bal/Dungog (A) | 3 | Coffs Harbour | 931.55 | 168 |
| Scone (A)/Merriwa (A) | 5 | Tamworth | 931.63 | 169 |
| South East | 17 | Adelaide | 931.83 | 170 |
| West Hotham-Dale | 24 | Narrogin | 931.97 | 171 |
| Hawkesbury (C): Richmond | 4 | Sydney | 931.97 | 172 |
| Wellington (S) | 7 | Wangarata | 932.35 | 173 |
| Dalby (T) | 14 | Roma | 932.75 | 174 |
| Ballarat (C) | 8 | Ballarat | 932.90 | 175 |
| Gundagai /Junee /Cootamundra | 6 | Wagga Wagga | 933.02 | 176 |
| Lachlan (A)/Yass (A) | 1 | Queanbeyan | 933.02 | 177 |
| Canterbury (C) | 4 | Sydney | 933.03 | 178 |
| Perth (C)/Vincent (T) | 20 | Perth | 933.30 | 179 |
| Brisbane: Eastern Outer | 9 | Brisbane | 933.37 | 180 |
| Bathurst (C) | 6 | Wagga Wagga | 933.61 | 181 |
| Leichhardt (A) | 4 | Sydney | 933.69 | 182 |
| Hervey Bay (C) | 13 | Rockhampton | 933.82 | 183 |
| Newcastle (C) | 3 | Coffs Harbour | 934.13 | 184 |
| Wanneroo (C): North-East | 20 | Perth | 934.13 | 185 |
| Maryborough (C) | 13 | Rockhampton | 934.17 | 186 |
| Livingstone (S): Yeppoon | 13 | Rockhampton | 934.36 | 187 |
| Caloundra Shire | 9 | Brisbane | 934.45 | 188 |
| Botany (A) | 4 | Sydney | 934.47 | 189 |
| Hindmarsh and Woodville (C) | 17 | Adelaide | 934.55 | 190 |
| Adelaide Central | 17 | Adelaide | 934.84 | 191 |
| Gold Coast City Pt A | 9 | Brisbane | 935.28 | 192 |
| Cooloola (S): Balance | 14 | Roma | 935.43 | 193 |
| Shellharbour (A) | 4 | Sydney | 935.43 | 194 |
| Calliope (S) | 13 | Rockhampton | 936.22 | 195 |
| Penrith: Mt Pleasant | 4 | Sydney | 936.34 | 196 |

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Bellingen (A) | 3 | Coffs Harbour | 936.52 | 197 |
| Cairns (C): Barron SLA | 10 | Cairns | 936.80 | 198 |
| Nightcliff/Rapid Creek | 36 | Darwin | 936.86 | 199 |
| Roebourne: Wickham | 25 | South Hedland | 936.93 | 200 |
| Canning (C) | 20 | Perth | 937.07 | 201 |
| Liverpool (C) | 4 | Sydney | 937.19 | 202 |
| Upper Murray | 6 | Wagga Wagga | 937.22 | 203 |
| Nymboida/Ulmarra | 3 | Coffs Harbour | 937.40 | 204 |
| Central Murray | 6 | Wagga Wagga | 937.45 | 205 |
| Shoalhaven: St Georges Basin | 1 | Queanbeyan | 937.56 | 206 |
| Yarra (C) North | 8 | Ballarat | 937.78 | 207 |
| Lismore (C) | 3 | Coffs Harbour | 938.09 | 208 |
| Rylstone /Mudgee /Coolah | 6 | Wagga Wagga | 938.29 | 209 |
| Campbelltown: Inner | 4 | Sydney | 938.34 | 210 |
| North Loddon-Mallee | 8 | Ballarat | 938.68 | 211 |
| Brighton (M) | 29 | Hobart | 938.80 | 212 |
| Darebin (C) | 8 | Ballarat | 938.98 | 213 |
| Livingstone (S): Balance | 13 | Rockhampton | 939.04 | 214 |
| Cooloola (S): Gympie | 14 | Roma | 939.11 | 215 |
| Pt Stephens: Raymond Terrace | 3 | Coffs Harbour | 939.26 | 216 |
| Palmerston Rem/Driver/East Arm | 36 | Darwin | 939.30 | 217 |
| Belmont (C) | 20 | Perth | 939.41 | 218 |
| Logan: Kingston SLA | 9 | Brisbane | 939.46 | 219 |
| Cockburn (C) | 20 | Perth | 939.65 | 220 |
| Roebourne: Karratha | 25 | South Hedland | 939.71 | 221 |
| Queanbeyan (C) | 1 | Queanbeyan | 939.80 | 222 |
| Blacktown (C): Seven Hills | 4 | Sydney | 939.96 | 223 |
| Central Tablelands | 6 | Wagga Wagga | 940.21 | 224 |
| Hastings (A): Pt Macquarie | 3 | Coffs Harbour | 940.27 | 225 |
| Esperance (S) | 27 | Kalgoorlie | 940.86 | 226 |
| Brisbane: City Inner - North | 9 | Brisbane | 940.89 | 227 |
| Thuringowa (C) | 16 | Townsville | 941.05 | 228 |
| Grafton (C) | 3 | Coffs Harbour | 941.26 | 229 |
| Narromine (A): Narromine town | 6 | Wagga Wagga | 941.52 | 230 |
| Burdekin (S): Balance | 16 | Townsville | 941.93 | 231 |
| Sarina (S) | 16 | Townsville | 941.96 | 232 |
| Whitsunday (S) | 16 | Townsville | 942.06 | 233 |
| Wanneroo (C): South-East | 20 | Perth | 942.11 | 234 |
| Emerald (S) | 13 | Rockhampton | 942.24 | 235 |
| Blacktown (C): Doonside | 4 | Sydney | 942.29 | 236 |
| Blackwood | 24 | Narrogin | 942.33 | 237 |
| Wagga Wagga (C) | 6 | Wagga Wagga | 942.41 | 238 |
| Gosnells (C) | 20 | Perth | 942.47 | 239 |
| Armadale (C) | 20 | Perth | 942.71 | 240 |
| Maitland (C) | 3 | Coffs Harbour | 942.71 | 241 |
| Muswellbrook (A) | 5 | Tamworth | 942.97 | 242 |
| Swan (S): Urban Areas | 20 | Perth | 943.25 | 243 |
| La Trobe (S) | 7 | Wangarata | 943.27 | 244 |
| Gr. Dandenong (C) | 7 | Wangarata | 943.28 | 245 |
| Nanango/Kilkivan/Wambo | 14 | Roma | 943.35 | 246 |
| Tweed Pt A: Balance | 3 | Coffs Harbour | 943.35 | 247 |
| Campbelltown: Minto | 4 | Sydney | 943.37 | 248 |
| E. Gippsland (S) balance | 7 | Wangarata | 943.49 | 249 |
| Stirling (C): Coastal | 20 | Perth | 943.83 | 250 |
| Brisbane: City Inner - South | 9 | Brisbane | 943.95 | 251 |
| Glenelg (S)/S. Grampians (S) | 8 | Ballarat | 943.96 | 252 |
| Winton (S)/Longreach (S) | 13 | Rockhampton | 944.27 | 253 |
| Blacktown (C): Mt Druitt | 4 | Sydney | 944.34 | 254 |
| Marrickville (A) | 4 | Sydney | 944.37 | 255 |
| Tweed Pt A: Kingscliff/Fingal | 3 | Coffs Harbour | 944.41 | 256 |
| Gray | 36 | Darwin | 944.55 | 257 |
| Mandurah (C) | 20 | Perth | 944.60 | 258 |
| Shoalhaven: Bomaderry-N. Nowra | 1 | Queanbeyan | 944.98 | 259 |
| Port Kennedy (Thursday Island) | 15 | Torres Strait Area | 945.01 | 260 |
| Stirling (C): Central | 20 | Perth | 945.37 | 261 |
| Central Roma region | 14 | Roma | 945.60 | 262 |

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| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Coffs Harbour (A): Town area | 3 | Coffs Harbour | 945.66 | 263 |
| Narromine (A): Balance | 6 | Wagga Wagga | 946.07 | 264 |
| Gatton & Laidley | 9 | Brisbane | 946.15 | 265 |
| Ballina (A): Balance | 3 | Coffs Harbour | 946.32 | 266 |
| Maribyrnong (C) | 8 | Ballarat | 946.54 | 267 |
| Ipswich (C): East SLA | 9 | Brisbane | 946.61 | 268 |
| Burnett (S) | 13 | Rockhampton | 946.90 | 269 |
| Esk & Kilcoy | 9 | Brisbane | 947.10 | 270 |
| Copmanhurst/Richmond R | 3 | Coffs Harbour | 947.13 | 271 |
| Munno Para (C) & Gawler (M) | 17 | Adelaide | 947.47 | 272 |
| Litchfield | 36 | Darwin | 947.48 | 273 |
| Hinchinbrook (S): Balance | 16 | Townsville | 947.62 | 274 |
| Parkes (A): Parkes town | 6 | Wagga Wagga | 947.79 | 275 |
| Rochester & Echuca | 8 | Ballarat | 947.88 | 276 |
| Quirindi (A)/Murrurundi (A) | 5 | Tamworth | 948.14 | 277 |
| South Perth (C) | 20 | Perth | 948.26 | 278 |
| Eurobodalla(A): Batemans Bay | 1 | Queanbeyan | 948.57 | 279 |
| Moulden | 36 | Darwin | 948.61 | 280 |
| Blacktown (C): Dharruk/Hebersham | 4 | Sydney | 948.83 | 281 |
| Albury (C) | 6 | Wagga Wagga | 948.96 | 282 |
| South Sydney (C): Balance | 4 | Sydney | 949.09 | 283 |
| Redcliffe City | 9 | Brisbane | 949.17 | 284 |
| Townsville (C) | 16 | Townsville | 949.39 | 285 |
| Fremantle(C)/East Fremantle(T) | 20 | Perth | 949.42 | 286 |
| Wellington (A): Balance | 6 | Wagga Wagga | 949.63 | 287 |
| Ipswich (C): Central SLA | 9 | Brisbane | 950.34 | 288 |
| Victoria Park (T) | 20 | Perth | 950.38 | 289 |
| Dubbo (C) | 6 | Wagga Wagga | 950.62 | 290 |
| Tamworth (C) | 5 | Tamworth | 950.76 | 291 |
| Tumut (A) | 6 | Wagga Wagga | 950.85 | 292 |
| Balance Ceduna region | 18 | Ceduna | 951.02 | 293 |
| Murgon (S) Balance | 14 | Roma | 951.34 | 294 |
| Taree (C): Balance | 3 | Coffs Harbour | 951.63 | 295 |
| Duaringa (S): Balance | 13 | Rockhampton | 951.65 | 296 |
| Walcha (A)/Gloucester (A) | 3 | Coffs Harbour | 951.66 | 297 |
| Elizabeth (C) | 17 | Adelaide | 952.12 | 298 |
| Mackay (C) Pt A SLA | 16 | Townsville | 952.36 | 299 |
| Parkes (A): Balance | 6 | Wagga Wagga | 952.47 | 300 |
| Taree (C): Taree town | 3 | Coffs Harbour | 952.53 | 301 |
| Jondaryan (S) | 14 | Roma | 952.69 | 302 |
| Blacktown (C): Willmot/Riverstone | 4 | Sydney | 952.79 | 303 |
| South Lakes | 24 | Narrogin | 952.93 | 304 |
| Whyalla (C) | 19 | Port Augusta | 953.09 | 305 |
| Cairns (C): Pt B Balance | 10 | Cairns | 953.20 | 306 |
| Enfield (C) - Pt A | 17 | Adelaide | 953.36 | 307 |
| Central Rockhampton region | 13 | Rockhampton | 953.52 | 308 |
| Berri/Barmera/Renmark | 17 | Adelaide | 953.75 | 309 |
| Port Hedland (T): Town | 25 | South Hedland | 953.79 | 310 |
| Baw Baw (S) | 7 | Wangarata | 953.81 | 311 |
| Wimmera | 8 | Ballarat | 953.98 | 312 |
| Mt Isa (C): Mt Isa town | 11 | Mount Isa | 954.35 | 313 |
| Campbelltown: Ambarvale/Rosemdw | 4 | Sydney | 954.52 | 314 |
| Katherine rural areas | 32 | Katherine | 954.58 | 315 |
| Mildura (RC) | 8 | Ballarat | 954.63 | 316 |
| Lachlan (A): Balance | 6 | Wagga Wagga | 954.63 | 317 |
| Gladstone (C) | 13 | Rockhampton | 954.66 | 318 |
| Broken Hill (C) | 2 | Bourke | 955.02 | 319 |
| Redland: North Stradbroke Island | 9 | Brisbane | 955.03 | 320 |
| Geraldton (C) | 28 | Geraldton | 955.39 | 321 |
| Broome: Town | 21 | Broome | 955.48 | 322 |
| Northern Slopes balance | 5 | Tamworth | 955.73 | 323 |
| Eurobodalla (A): Balance | 1 | Queanbeyan | 955.73 | 324 |
| Gr. Shepparton (C) | 7 | Wangarata | 955.74 | 325 |
| Cairns (C): Bal Trinity SLA | 10 | Cairns | 955.74 | 326 |
| Bundaberg (C) | 13 | Rockhampton | 956.00 | 327 |
| Nambucca: Nambucca Heads | 3 | Coffs Harbour | 956.02 | 328 |

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Douglas (S): Balance | 10 | Cairns | 956.16 | 329 |
| Busselton (S) | 24 | Narrogin | 956.26 | 330 |
| Bunbury (C) | 24 | Narrogin | 956.31 | 331 |
| Forbes (A) | 6 | Wagga Wagga | 956.34 | 332 |
| Nambucca: Balance | 3 | Coffs Harbour | 956.34 | 333 |
| Greenough (S) | 28 | Geraldton | 956.39 | 334 |
| Campbelltown: Macquarie Fields | 4 | Sydney | 956.71 | 335 |
| Bega Valley (A) | 1 | Queanbeyan | 957.41 | 336 |
| Rockhampton (C) | 13 | Rockhampton | 957.50 | 337 |
| Nebo(S)/Mirani(S)/Mackay(C)Bal | 16 | Townsville | 957.64 | 338 |
| Northampton/Chapman Valley | 28 | Geraldton | 957.73 | 339 |
| Bassendean (T) | 20 | Perth | 957.80 | 340 |
| Cowra (A) | 6 | Wagga Wagga | 958.05 | 341 |
| Randwick (C): La Perouse | 4 | Sydney | 958.30 | 342 |
| Young /Weddin /Harden | 6 | Wagga Wagga | 958.34 | 343 |
| North Avon/West Campion | 24 | Narrogin | 958.53 | 344 |
| Toowoomba (C) | 14 | Roma | 958.60 | 345 |
| Central Katherine | 32 | Katherine | 958.71 | 346 |
| Roma (T) | 14 | Roma | 959.30 | 347 |
| Narrabri (A): Narrabri Town | 5 | Tamworth | 959.33 | 348 |
| Port Lincoln (C) | 18 | Ceduna | 959.58 | 349 |
| Cape York: Balance | 12 | Cooktown | 959.59 | 350 |
| Ross | 30 | Alice Springs | 959.95 | 351 |
| Gilgandra (A) | 6 | Wagga Wagga | 959.99 | 352 |
| Larapinta | 30 | Alice Springs | 960.01 | 353 |
| Ballina (A): Ballina town | 3 | Coffs Harbour | 960.25 | 354 |
| Enfield (C) - Pt B | 17 | Adelaide | 960.32 | 355 |
| Wreck Bay (Jervis Bay) | 1 | Queanbeyan | 961.00 | 356 |
| Orange (C) | 6 | Wagga Wagga | 961.38 | 357 |
| Albany (T) | 24 | Narrogin | 961.83 | 358 |
| Dumaresq (A)/Uralla (A) | 5 | Tamworth | 961.92 | 359 |
| Shoalhaven: Nowra | 1 | Queanbeyan | 961.93 | 360 |
| East Pilbara: Newman | 23 | Warburton | 961.96 | 361 |
| Swan (S): Northern Rural | 20 | Perth | 962.43 | 362 |
| Cairns (C): Central Suburbs SLA | 10 | Cairns | 962.78 | 363 |
| Coffs Harbour (A): Sawtell | 3 | Coffs Harbour | 963.08 | 364 |
| Cloncurry (S): Cloncurry | 11 | Mount Isa | 963.20 | 365 |
| Bairnsdale | 7 | Wangarata | 963.26 | 366 |
| Maclean (A) | 3 | Coffs Harbour | 963.34 | 367 |
| Dundas (S) | 27 | Kalgoorlie | 963.45 | 368 |
| Atherton (S) | 10 | Cairns | 963.52 | 369 |
| East Campion | 24 | Narrogin | 963.77 | 370 |
| Kwinana (T) | 20 | Perth | 964.73 | 371 |
| Cairns (C): City SLA | 10 | Cairns | 964.83 | 372 |
| Balranald (A)/Hay (A) | 6 | Wagga Wagga | 964.94 | 373 |
| Kalgoorlie/Boulder: Town | 27 | Kalgoorlie | 965.11 | 374 |
| Eastern Roma region | 14 | Roma | 965.54 | 375 |
| Yalgoo/Morawa/Perenjori | 28 | Geraldton | 965.68 | 376 |
| Armidale (C) | 5 | Tamworth | 965.74 | 377 |
| Blacktown (C): Shalvey | 4 | Sydney | 966.02 | 378 |
| Ludmilla/Coconut Grove | 36 | Darwin | 966.28 | 379 |
| Blacktown (C): Lethbridge Park | 4 | Sydney | 966.46 | 380 |
| W. Greenough River | 28 | Geraldton | 966.53 | 381 |
| Inverell (A) | 5 | Tamworth | 966.78 | 382 |
| Swan Hill (RC) | 8 | Ballarat | 967.06 | 383 |
| Northam (S)/York/Beverley | 24 | Narrogin | 967.41 | 384 |
| North Wide Bay | 13 | Rockhampton | 967.44 | 385 |
| Murray Bridge (RC) | 17 | Adelaide | 967.54 | 386 |
| Narrabri (A): Balance | 5 | Tamworth | 967.62 | 387 |
| Great Lakes: Forster-Tuncurry | 3 | Coffs Harbour | 967.84 | 388 |
| Logan: Woodridge SLA | 9 | Brisbane | 968.15 | 389 |
| Lachlan (A): Condobolin | 6 | Wagga Wagga | 968.39 | 390 |
| Murray/Serpentine-Jarrahdale | 20 | Perth | 968.49 | 391 |
| Blacktown (C): Whalan | 4 | Sydney | 968.56 | 392 |
| Carrathool /Murrumbidgee | 6 | Wagga Wagga | 968.68 | 393 |
| Bowen (S): Bowen Town | 16 | Townsville | 968.71 | 394 |

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Blacktown (C): Emerton/Blackett | 4 | Sydney | 969.00 | 395 |
| Banana (S) | 13 | Rockhampton | 969.17 | 396 |
| Wyndham-EKimb: Kununurra | 22 | Kununurra | 969.63 | 397 |
| Blacktown (C): Tregear | 4 | Sydney | 970.42 | 398 |
| Leeton (A) | 6 | Wagga Wagga | 970.62 | 399 |
| Charters Towers (C) | 16 | Townsville | 970.71 | 400 |
| Blacktown (C): Bidwill | 4 | Sydney | 970.90 | 401 |
| TRAWQ (Thursday Island) | 15 | Torres Strait Area | 971.14 | 402 |
| Kempsey (A): Kempsey town | 3 | Coffs Harbour | 971.17 | 403 |
| Brisbane: Inala SLA | 9 | Brisbane | 971.19 | 404 |
| Upper North | 19 | Port Augusta | 971.27 | 405 |
| Cairns (C): Gordonvale | 10 | Cairns | 971.86 | 406 |
| Murweh (S) | 14 | Roma | 972.20 | 407 |
| Herberton (S) | 10 | Cairns | 972.22 | 408 |
| Kempsey (A): Balance | 3 | Coffs Harbour | 972.46 | 409 |
| Warwick (S) | 14 | Roma | 972.92 | 410 |
| Balonne (S): St George | 14 | Roma | 974.40 | 411 |
| Central Darling: Bal/Far West | 2 | Bourke | 974.74 | 412 |
| Moora | 24 | Narrogin | 974.96 | 413 |
| Murray (A)/Deniliquin (A) | 6 | Wagga Wagga | 975.43 | 414 |
| Coomalie CGC | 36 | Darwin | 975.62 | 415 |
| Brewarrina (A): Goodooga | 2 | Bourke | 975.90 | 416 |
| Northam (T) | 24 | Narrogin | 975.94 | 417 |
| Johnstone (S): Balance | 10 | Cairns | 976.03 | 418 |
| Wellington (A): Wellington Town | 6 | Wagga Wagga | 976.24 | 419 |
| Dalrymple (S)/Flinders (S) | 16 | Townsville | 979.00 | 420 |
| Narrabri (A): Wee Waa | 5 | Tamworth | 979.01 | 421 |
| Walgett (A): Lightning Ridge | 2 | Bourke | 979.04 | 422 |
| South Sydney (C): Waterloo | 4 | Sydney | 979.48 | 423 |
| Coonabarabran (A) | 6 | Wagga Wagga | 979.50 | 424 |
| Balonne (S): Balance | 14 | Roma | 980.00 | 425 |
| Horn Island | 15 | Torres Strait Area | 980.14 | 426 |
| North Hotham/North Lakes | 24 | Narrogin | 980.19 | 427 |
| Tenterfield (A)/Severn (A) | 5 | Tamworth | 980.30 | 428 |
| Griffith (C) | 6 | Wagga Wagga | 980.48 | 429 |
| Gunnedah (A): Gunnedah Town | 5 | Tamworth | 981.35 | 430 |
| Collie (S) | 24 | Narrogin | 982.01 | 431 |
| South Pallinup | 24 | Narrogin | 982.23 | 432 |
| Bourke (A): Bal/Cobar Town | 2 | Bourke | 982.33 | 433 |
| Bal Murray Mallee | 17 | Adelaide | 982.49 | 434 |
| Narrogin (T)/Narrogin (S) | 24 | Narrogin | 983.14 | 435 |
| Tennant Creek town excl camps | 35 | Tennant Creek | 983.46 | 436 |
| Bowen (S): Balance | 16 | Townsville | 983.93 | 437 |
| Narrandera (A) | 6 | Wagga Wagga | 984.18 | 438 |
| Yorke peninsula | 17 | Adelaide | 984.84 | 439 |
| Moree Plains (A): Moree Town | 5 | Tamworth | 985.65 | 440 |
| Wondai (S)/Kingaroy (S) | 14 | Roma | 985.87 | 441 |
| Port Augusta (C) | 19 | Port Augusta | 985.98 | 442 |
| Kyogle (A) | 3 | Coffs Harbour | 986.10 | 443 |
| Central Darling: Wilcannia | 2 | Bourke | 986.34 | 444 |
| Campbelltown: Airds | 4 | Sydney | 986.48 | 445 |
| Carnarvon (S): Town | 28 | Geraldton | 986.70 | 446 |
| Coonamble (A): Coonamble Town | 2 | Bourke | 987.11 | 447 |
| Coolgardie: Balance | 27 | Kalgoorlie | 987.13 | 448 |
| Barcoo(S)/Quilpie(S)/Bulloo(S) | 14 | Roma | 987.18 | 449 |
| Burdekin (S): Ayr | 16 | Townsville | 987.19 | 450 |
| Casino (A) | 3 | Coffs Harbour | 988.08 | 451 |
| Meekatharra (S): Town | 28 | Geraldton | 988.28 | 452 |
| Johnstone (S): Innisfail | 10 | Cairns | 988.85 | 453 |
| Eacham (S) | 10 | Cairns | 989.44 | 454 |
| Wentworth (A): Balance | 2 | Bourke | 989.93 | 455 |
| Wyndham-EKimb: Wyndham | 22 | Kununurra | 990.07 | 456 |
| Plantagenet (S) | 24 | Narrogin | 990.20 | 457 |
| Bogan (A) | 6 | Wagga Wagga | 990.89 | 458 |
| Cue/Sandstone/Mt Magnet | 28 | Geraldton | 991.22 | 459 |
| Southern Rockhampton Region | 13 | Rockhampton | 992.45 | 460 |

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Flinders & Far North | 19 | Port Augusta | 993.05 | 461 |
| Moree Plains (A): Boggabilla | 5 | Tamworth | 993.21 | 462 |
| Katanning (S)/Broomehill (S) | 24 | Narrogin | 993.59 | 463 |
| Bourke (A): Bourke Town | 2 | Bourke | 994.37 | 464 |
| Gunnedah (A): Balance | 5 | Tamworth | 995.03 | 465 |
| Hinchinbrook (S): Ingham | 16 | Townsville | 995.83 | 466 |
| Mt Morgan (S) | 13 | Rockhampton | 996.05 | 467 |
| Bal Riverland | 17 | Adelaide | 996.11 | 468 |
| Leonora (S) | 27 | Kalgoorlie | 998.05 | 469 |
| Derby-WKimb: Derby | 26 | Derby | 999.85 | 470 |
| Meekatharra (S): Southwest | 28 | Geraldton | 999.90 | 471 |
| Brewarrina (A): Brewarrina Town | 2 | Bourke | 1000.02 | 472 |
| Roebourne: Roebourne town | 25 | South Hedland | 1000.15 | 473 |
| Brewarrina (A): Balance | 2 | Bourke | 1001.53 | 474 |
| Harvey (S) | 24 | Narrogin | 1001.68 | 475 |
| Taree (C): Purfleet | 3 | Coffs Harbour | 1001.72 | 476 |
| Charles | 30 | Alice Springs | 1001.99 | 477 |
| Port Pirie (C) | 19 | Port Augusta | 1002.28 | 478 |
| South Avon | 24 | Narrogin | 1002.58 | 479 |
| Paroo (S) | 14 | Roma | 1003.37 | 480 |
| Warren (A) | 6 | Wagga Wagga | 1003.54 | 481 |
| Shark Bay (S)/Murchison (S) | 28 | Geraldton | 1004.31 | 482 |
| Croydon (S) & Etheridge (S) | 10 | Cairns | 1004.79 | 483 |
| Mullewa (S) | 28 | Geraldton | 1004.92 | 484 |
| Moree Plains (A): Balance | 5 | Tamworth | 1005.04 | 485 |
| Walgett (A): Walgett town | 2 | Bourke | 1005.41 | 486 |
| Coolgardie: Town | 27 | Kalgoorlie | 1005.47 | 487 |
| Walgett (A): Collarenebri | 2 | Bourke | 1007.23 | 488 |
| Heavitree | 30 | Alice Springs | 1007.99 | 489 |
| South Sydney (C): Redfern | 4 | Sydney | 1008.25 | 490 |
| Guyra (A) | 5 | Tamworth | 1008.26 | 491 |
| Cardwell (S): Balance | 16 | Townsville | 1009.87 | 492 |
| Moree Plains (A): Toomelah | 5 | Tamworth | 1010.81 | 493 |
| Burke (S): Bal/Carpentaria (S) | 11 | Mount Isa | 1011.04 | 494 |
| Douglas (S): Mossman | 10 | Cairns | 1011.93 | 495 |
| Mareeba (S): Mareeba Town | 10 | Cairns | 1011.94 | 496 |
| Mareeba (S): Balance | 10 | Cairns | 1012.31 | 497 |
| Elsey balance/Mataranka | 32 | Katherine | 1012.90 | 498 |
| Cooktown | 12 | Cooktown | 1015.37 | 499 |
| Walgett (A): Balance | 2 | Bourke | 1016.80 | 500 |
| Stuart | 30 | Alice Springs | 1016.98 | 501 |
| Jabiru (T)/South Alligator | 31 | Jabiru | 1018.71 | 502 |
| Minjilang | 31 | Jabiru | 1019.35 | 503 |
| Burke (S): Normanton | 11 | Mount Isa | 1021.58 | 504 |
| Boulia (S) & Diamantina (S) | 11 | Mount Isa | 1021.95 | 505 |
| Gascoyne | 28 | Geraldton | 1022.08 | 506 |
| Ceduna (DC) | 18 | Ceduna | 1022.93 | 507 |
| Cloncurry (S): Bal/McKinlay (S) | 11 | Mount Isa | 1024.61 | 508 |
| Halls Creek: Town | 22 | Kununurra | 1026.58 | 509 |
| Laverton (S): Western balance | 27 | Kalgoorlie | 1030.07 | 510 |
| Lake Tyers | 7 | Wangarata | 1030.82 | 511 |
| Wyndham-EKimb: Eastern balance | 22 | Kununurra | 1031.56 | 512 |
| Seisia | 15 | Torres Strait Area | 1034.12 | 513 |
| Ashburton | 25 | South Hedland | 1037.09 | 514 |
| Roebourne: Balance | 25 | South Hedland | 1039.50 | 515 |
| Bamaga | 15 | Torres Strait Area | 1041.85 | 516 |
| Mareeba (S): Kuranda | 10 | Cairns | 1042.53 | 517 |
| Cardwell (S): Tully | 16 | Townsville | 1042.86 | 518 |
| Duaringa (S): Woorabinda | 13 | Rockhampton | 1044.80 | 519 |
| Mt Isa (C): Balance | 11 | Mount Isa | 1048.15 | 520 |
| Belyuen & outstations | 36 | Darwin | 1048.58 | 521 |
| Kalgoorlie: West/Menzies: West | 27 | Kalgoorlie | 1050.65 | 522 |
| Coen | 12 | Cooktown | 1051.63 | 523 |
| Cobar (A): Murrin Bridge part | 6 | Wagga Wagga | 1058.11 | 524 |
| Balance TSRA | 15 | Torres Strait Area | 1058.31 | 525 |
| Pirlangimpi | 31 | Jabiru | 1058.90 | 526 |

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Coonamble (A): Balance | 2 | Bourke | 1063.75 | 527 |
| Hammond Island | 15 | Torres Strait Area | 1065.97 | 528 |
| St Pauls (Moa Island) | 15 | Torres Strait Area | 1067.34 | 529 |
| New Mapoon | 12 | Cooktown | 1073.19 | 530 |
| Sandover Balance part A | 30 | Alice Springs | 1074.94 | 531 |
| Kubin (Moa Island) | 15 | Torres Strait Area | 1078.74 | 532 |
| Atitjere | 33 | Aputula | 1083.11 | 533 |
| Coober Pedy (DC) | 19 | Port Augusta | 1084.04 | 534 |
| Yulara/Mutijulu | 33 | Aputula | 1084.84 | 535 |
| Kalano | 32 | Katherine | 1085.57 | 536 |
| East Pilbara: Marble Bar | 25 | South Hedland | 1088.04 | 537 |
| Broome: Djarindjin (Lombadina) | 21 | Broome | 1088.97 | 538 |
| Broome: Bardi (One Arm Pt) | 21 | Broome | 1090.17 | 539 |
| Darnley Island | 15 | Torres Strait Area | 1090.65 | 540 |
| Yorke Islands | 15 | Torres Strait Area | 1091.52 | 541 |
| Port Hedland (T): Balance | 25 | South Hedland | 1092.48 | 542 |
| Hopevale | 12 | Cooktown | 1094.19 | 543 |
| Boigu Island | 15 | Torres Strait Area | 1096.70 | 544 |
| Saibai Island | 15 | Torres Strait Area | 1097.09 | 545 |
| Binjari | 32 | Katherine | 1097.42 | 546 |
| Warraber Island | 15 | Torres Strait Area | 1100.00 | 547 |
| Injinoo (Cowal Creek) | 12 | Cooktown | 1101.96 | 548 |
| Lockhart River | 12 | Cooktown | 1103.40 | 549 |
| Haasts Bluff | 33 | Aputula | 1103.95 | 550 |
| Cairns (C): Yarrabah | 10 | Cairns | 1104.46 | 551 |
| Murgon (S): Cherbourg | 14 | Roma | 1104.84 | 552 |
| East Pilbara: Punmu | 23 | Warburton | 1108.13 | 553 |
| Daly balance/Pine Ck/Peppi | 31 | Jabiru | 1108.18 | 554 |
| Badu Island | 15 | Torres Strait Area | 1108.38 | 555 |
| Laverton: Cosmo Newberry | 23 | Warburton | 1108.66 | 556 |
| Barunga Manyallaluk | 32 | Katherine | 1109.07 | 557 |
| Lajamanu | 32 | Katherine | 1110.09 | 558 |
| Amoonguna | 30 | Alice Springs | 1110.85 | 559 |
| Mabuiag Island | 15 | Torres Strait Area | 1111.45 | 560 |
| Broome: Beagle Bay | 21 | Broome | 1111.89 | 561 |
| Nguiu | 31 | Jabiru | 1113.87 | 562 |
| Milikapiti | 31 | Jabiru | 1114.74 | 563 |
| Burke (S): Doomadgee | 11 | Mount Isa | 1115.13 | 564 |
| Napranum | 12 | Cooktown | 1115.88 | 565 |
| Nauiyu Nambiyu | 31 | Jabiru | 1117.18 | 566 |
| Wujal Wujal (Bloomfield R) | 12 | Cooktown | 1120.11 | 567 |
| Wallace Rockhole | 33 | Aputula | 1120.45 | 568 |
| Bagot | 36 | Darwin | 1121.70 | 569 |
| Pormpuraaw | 12 | Cooktown | 1122.34 | 570 |
| Stephens Island | 15 | Torres Strait Area | 1122.61 | 571 |
| Bulman | 32 | Katherine | 1124.11 | 572 |
| Wiluna (S)/Meekatharra(S): Nth | 23 | Warburton | 1124.57 | 573 |
| Murray Islands | 15 | Torres Strait Area | 1124.65 | 574 |
| Hinchinbrook (S): Palm Island | 16 | Townsville | 1124.76 | 575 |
| Dauan Island | 15 | Torres Strait Area | 1127.14 | 576 |
| Urapuntja | 33 | Aputula | 1128.64 | 577 |
| Derby-WKimb: Fitzroy Crossing | 26 | Derby | 1131.29 | 578 |
| Kalkarinji | 32 | Katherine | 1131.74 | 579 |
| Tennant Creek - Bal | 35 | Tennant Creek | 1131.82 | 580 |
| Tapatjatjaka | 33 | Aputula | 1132.13 | 581 |
| Broome: Balance | 21 | Broome | 1134.28 | 582 |
| Petermann balance | 33 | Aputula | 1135.56 | 583 |
| Borroloola | 32 | Katherine | 1136.19 | 584 |
| Aputula | 33 | Aputula | 1136.47 | 585 |
| Kunbarllanjnja - Oenpelli | 31 | Jabiru | 1137.44 | 586 |
| Wadeye | 31 | Jabiru | 1140.23 | 587 |
| Wugularr | 32 | Katherine | 1140.47 | 588 |
| Warruwi | 31 | Jabiru | 1142.08 | 589 |
| Ramingining outstations | 34 | Nhulunbuy | 1143.38 | 590 |
| West Arnhem balance part B | 32 | Katherine | 1143.52 | 591 |
| Milyakburra | 34 | Nhulunbuy | 1145.63 | 592 |

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Derby-WKimb: Western balance | 26 | Derby | 1146.12 | 593 |
| Walungurru | 33 | Aputula | 1147.23 | 594 |
| Marla Marla/Nyinkkanyunyu | 35 | Tennant Creek | 1148.09 | 595 |
| Yuendumu | 33 | Aputula | 1148.85 | 596 |
| Umagico | 12 | Cooktown | 1151.60 | 597 |
| Angurugu | 34 | Nhulunbuy | 1154.71 | 598 |
| East Pilbara: East | 23 | Warburton | 1155.76 | 599 |
| Ngalpa Ngalpa/Wuppa/Tingkkarli | 35 | Tennant Creek | 1158.47 | 600 |
| Laverton/Menzies/Kalg.East | 23 | Warburton | 1158.50 | 601 |
| Ltyentye Purte (Santa Teresa) | 33 | Aputula | 1159.40 | 602 |
| East Pilbara: Yandearra | 25 | South Hedland | 1160.81 | 603 |
| Derby-WKimb: Youngngora | 26 | Derby | 1160.95 | 604 |
| Mornington (S) & Uninc Islands | 11 | Mount Isa | 1161.36 | 605 |
| Ramingining | 34 | Nhulunbuy | 1162.27 | 606 |
| Wyndham-EKimb: Western balance | 22 | Kununurra | 1162.58 | 607 |
| Areyonga | 33 | Aputula | 1163.91 | 608 |
| Halls Creek: Northern balance | 22 | Kununurra | 1166.07 | 609 |
| Kaltukatjara | 33 | Aputula | 1166.77 | 610 |
| Tanami balance | 33 | Aputula | 1167.11 | 611 |
| Watiyawanu | 33 | Aputula | 1167.88 | 612 |
| Yalata | 18 | Ceduna | 1169.11 | 613 |
| Halls Creek: Warmun (Balingarri) | 22 | Kununurra | 1169.83 | 614 |
| Timber Creek | 32 | Katherine | 1170.28 | 615 |
| Numbulwar | 34 | Nhulunbuy | 1176.13 | 616 |
| Halls Creek: Southern balance | 22 | Kununurra | 1177.61 | 617 |
| Derby-WKimb: Bayulu | 26 | Derby | 1178.55 | 618 |
| Umbakumba | 34 | Nhulunbuy | 1179.99 | 619 |
| Carnarvon (S): Mungullah | 28 | Geraldton | 1181.37 | 620 |
| Sandover balance part B | 33 | Aputula | 1181.56 | 621 |
| Broome: Bidyadanga | 21 | Broome | 1183.66 | 622 |
| Derby-WKimb: Eastern balance | 26 | Derby | 1184.42 | 623 |
| Elliott | 35 | Tennant Creek | 1184.76 | 624 |
| Tableland balance | 35 | Tennant Creek | 1184.97 | 625 |
| Borroloola surrounds | 32 | Katherine | 1185.69 | 626 |
| Ernabella (Pukatja) & Anilalya | 19 | Port Augusta | 1186.17 | 627 |
| Maningrida | 31 | Jabiru | 1186.33 | 628 |
| Minyeri & Yugul Mangi bal | 32 | Katherine | 1187.22 | 629 |
| Yirrkala | 34 | Nhulunbuy | 1187.38 | 630 |
| Papunya | 33 | Aputula | 1188.43 | 631 |
| Gapuwiyak | 34 | Nhulunbuy | 1189.34 | 632 |
| Derby-WKimb: Northern balance | 26 | Derby | 1189.51 | 633 |
| Gulf balance | 32 | Katherine | 1190.63 | 634 |
| Derby-WKimb: Looma | 26 | Derby | 1194.93 | 635 |
| Hermannsburg | 33 | Aputula | 1197.12 | 636 |
| Anmatjere CGC | 33 | Aputula | 1197.95 | 637 |
| Kowanyama | 12 | Cooktown | 1198.05 | 638 |
| Victoria balance | 32 | Katherine | 1198.35 | 639 |
| Derby-WKimb: Mowanjum | 26 | Derby | 1202.93 | 640 |
| Maningrida outstations | 31 | Jabiru | 1203.41 | 641 |
| Ali Curung | 35 | Tennant Creek | 1203.84 | 642 |
| Walangeri Ngumpinku | 32 | Katherine | 1203.87 | 643 |
| Laynhapuy homelands | 34 | Nhulunbuy | 1204.87 | 644 |
| Hermannsburg outstations | 33 | Aputula | 1205.12 | 645 |
| Wyndham-EKimb: Kalumburu | 22 | Kununurra | 1205.93 | 646 |
| Galiwinku | 34 | Nhulunbuy | 1206.03 | 647 |
| Derby-WKimb: Southern balance | 26 | Derby | 1206.05 | 648 |
| Kalgoorlie/Boulder: Ninga Mia | 27 | Kalgoorlie | 1206.82 | 649 |
| Ngaanyatjarraku: Balance | 23 | Warburton | 1208.45 | 650 |
| Galiwinku outstations | 34 | Nhulunbuy | 1210.79 | 651 |
| East Pilbara: Jigalong | 23 | Warburton | 1213.39 | 652 |
| HCk: Mindibungu (Billiluna) | 22 | Kununurra | 1213.56 | 653 |
| Marngarr | 34 | Nhulunbuy | 1215.10 | 654 |
| Alpurrurulam | 35 | Tennant Creek | 1215.78 | 655 |
| East Pilbara: West | 25 | South Hedland | 1217.16 | 656 |
| Ngaanyatjarraku: Tjukurla | 23 | Warburton | 1218.26 | 657 |
| Ngaanyatjarraku: Papulankutja | 23 | Warburton | 1219.81 | 658 |

| NAME | AREG Code | ATSIC Region Name | Disadvantage Index | Rank Australia Wide (1 least disadvantaged) |
|---|---|---|---|---|
| Halls Creek: Mulan | 22 | Kununurra | 1220.42 | 659 |
| Aurukun SLA | 12 | Cooktown | 1221.06 | 660 |
| Ngaanyatjarraku: Wannan | 23 | Warburton | 1221.14 | 661 |
| Halls Creek: Balgo Hills | 22 | Kununurra | 1221.53 | 662 |
| Ngaanyatjarraku: Warburton | 23 | Warburton | 1222.54 | 663 |
| Partalki/Wartijipalkari | 35 | Tennant Creek | 1226.52 | 664 |
| Epenarra | 35 | Tennant Creek | 1227.96 | 665 |
| Jilkminggan | 32 | Katherine | 1232.08 | 666 |
| Ngukurr | 32 | Katherine | 1233.50 | 667 |
| Ngaanyatjarraku: Irrunytju | 23 | Warburton | 1238.98 | 668 |
| Derby-WKimb: Wangkatjunka | 26 | Derby | 1241.99 | 669 |
| Milingimbi | 34 | Nhulunbuy | 1243.03 | 670 |
| East Pilbara: Nullagine | 25 | South Hedland | 1244.15 | 671 |
| Ampilatwatja | 33 | Aputula | 1248.66 | 672 |
| Nyirripi | 33 | Aputula | 1249.98 | 673 |
| Imanpa | 33 | Aputula | 1259.57 | 674 |
| Dagaragu | 32 | Katherine | 1260.83 | 675 |
| Kunbarllanjnja o/s/W Arn bal. | 31 | Jabiru | 1264.54 | 676 |
| Canteen Creek | 35 | Tennant Creek | 1266.66 | 677 |
| Palumpa - Nganmarriyanga | 31 | Jabiru | 1277.82 | 678 |
| East Pilbara: Kiwirrkurra | 23 | Warburton | 1288.27 | 679 |
| HCk:KundatDjaru(RingersSoak) | 22 | Kununurra | 1290.08 | 680 |
| Gapuwiyak outstations | 34 | Nhulunbuy | 1318.59 | 681 |
| Willowra | 33 | Aputula | 1320.36 | 682 |
| Yuelamu | 33 | Aputula | 1342.16 | 683 |
| Mimili | 19 | Port Augusta | 1343.28 | 684 |

# APPENDIX 5.  INDIGENOUS SOCIOECONOMIC DISADVANTAGE TAKING INTO ACCOUNT THE ACCESSIBILITY/ REMOTENESS INDEX OF AUSTRALIA (ARIA)

These are presented in the following order:

 (i)  remote areas

 (ii)  moderately accessible areas;  and

(iii)  accessible areas.

# REMOTE AREAS

| Indigenous Area | AREG CODE | ATSIC Region | REMOTE INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Walgett (A): Lightning Ridge | 2 | Bourke | 880.79 | 1 |
| Brewarrina (A): Goodooga | 2 | Bourke | 883.13 | 2 |
| Central Darling: Bal/Far West | 2 | Bourke | 885.41 | 3 |
| Bourke (A): Bal/Cobar Town | 2 | Bourke | 887.32 | 4 |
| Bourke (A): Bourke Town | 2 | Bourke | 887.99 | 5 |
| Central Darling: Wilcannia | 2 | Bourke | 888.51 | 6 |
| Coonamble (A): Coonamble Town | 2 | Bourke | 890.29 | 7 |
| Brewarrina (A): Brewarrina Town | 2 | Bourke | 900.68 | 8 |
| Walgett (A): Collarenebri | 2 | Bourke | 902.58 | 9 |
| Brewarrina (A): Balance | 2 | Bourke | 903.62 | 10 |
| Walgett (A): Walgett town | 2 | Bourke | 908.52 | 11 |
| Walgett (A): Balance | 2 | Bourke | 923.34 | 12 |
| Coonamble (A): Balance | 2 | Bourke | 971.50 | 13 |
| Bogan (A) | 6 | Wagga Wagga | 904.45 | 1 |
| Cobar (A): Murrin Bridge part | 6 | Wagga Wagga | 958.06 | 2 |
| Croydon (S) & Etheridge (S) | 10 | Cairns | 908.18 | 1 |
| Mt Isa (C): Mt Isa town | 11 | Mount Isa | 851.78 | 1 |
| Cloncurry (S): Cloncurry | 11 | Mount Isa | 868.85 | 2 |
| Burke (S): Bal/Carpentaria (S) | 11 | Mount Isa | 907.45 | 3 |
| Burke (S): Normanton | 11 | Mount Isa | 915.60 | 4 |
| Boulia (S) & Diamantina (S) | 11 | Mount Isa | 917.68 | 5 |
| Cloncurry (S): Bal/McKinlay (S) | 11 | Mount Isa | 919.82 | 6 |
| Mt Isa (C): Balance | 11 | Mount Isa | 947.22 | 7 |
| Burke (S): Doomadgee | 11 | Mount Isa | 1014.32 | 8 |
| Mornington (S) & Uninc Islands | 11 | Mount Isa | 1062.56 | 9 |
| Cook (S) - Weipa only SLA | 12 | Cooktown | 777.55 | 1 |
| Cape York: Balance | 12 | Cooktown | 861.56 | 2 |
| Cooktown | 12 | Cooktown | 910.91 | 3 |
| Coen | 12 | Cooktown | 940.14 | 4 |
| New Mapoon | 12 | Cooktown | 983.89 | 5 |
| Hopevale | 12 | Cooktown | 999.60 | 6 |
| Injinoo (Cowal Creek) | 12 | Cooktown | 1007.99 | 7 |
| Lockhart River | 12 | Cooktown | 1018.03 | 8 |
| Napranum | 12 | Cooktown | 1024.42 | 9 |
| Pormpuraaw | 12 | Cooktown | 1030.10 | 10 |
| Wujal Wujal (Bloomfield R) | 12 | Cooktown | 1035.88 | 11 |
| Umagico | 12 | Cooktown | 1057.25 | 12 |
| Kowanyama | 12 | Cooktown | 1100.63 | 13 |
| Aurukun SLA | 12 | Cooktown | 1127.88 | 14 |
| Broadsound/Belyando/Peak Downs | 13 | Rockhampton | 807.33 | 1 |
| Winton (S)/Longreach (S) | 13 | Rockhampton | 838.60 | 2 |
| Central Rockhampton region | 13 | Rockhampton | 855.49 | 3 |
| Balonne (S): St George | 14 | Roma | 879.66 | 1 |
| Murweh (S) | 14 | Roma | 880.01 | 2 |
| Balonne (S): Balance | 14 | Roma | 883.66 | 3 |
| Barcoo(S)/Quilpie(S)/Bulloo(S) | 14 | Roma | 892.35 | 4 |
| Paroo (S) | 14 | Roma | 901.24 | 5 |
| Port Kennedy (Thursday Island) | 15 | Torres Strait Area | 832.56 | 1 |
| TRAWQ (Thursday Island) | 15 | Torres Strait Area | 852.57 | 2 |
| Horn Island | 15 | Torres Strait Area | 875.43 | 3 |
| Seisia | 15 | Torres Strait Area | 939.21 | 4 |
| Bamaga | 15 | Torres Strait Area | 943.71 | 5 |
| Balance TSRA | 15 | Torres Strait Area | 964.53 | 6 |
| Hammond Island | 15 | Torres Strait Area | 965.11 | 7 |
| St Pauls (Moa Island) | 15 | Torres Strait Area | 969.88 | 8 |
| Kubin (Moa Island) | 15 | Torres Strait Area | 980.95 | 9 |
| Saibai Island | 15 | Torres Strait Area | 982.66 | 10 |
| Yorke Islands | 15 | Torres Strait Area | 995.46 | 11 |
| Boigu Island | 15 | Torres Strait Area | 999.69 | 12 |
| Darnley Island | 15 | Torres Strait Area | 1002.24 | 13 |
| Warraber Island | 15 | Torres Strait Area | 1004.27 | 14 |
| Mabuiag Island | 15 | Torres Strait Area | 1007.65 | 15 |
| Badu Island | 15 | Torres Strait Area | 1013.81 | 16 |
| Dauan Island | 15 | Torres Strait Area | 1026.78 | 17 |
| Murray Islands | 15 | Torres Strait Area | 1032.26 | 18 |
| Stephens Island | 15 | Torres Strait Area | 1039.07 | 19 |
| Dalrymple (S)/Flinders (S) | 16 | Townsville | 877.28 | 1 |
| Bowen (S): Balance | 16 | Townsville | 880.38 | 2 |
| Balance Ceduna region | 18 | Ceduna | 845.04 | 1 |
| Port Lincoln (C) | 18 | Ceduna | 856.59 | 2 |
| Ceduna (DC) | 18 | Ceduna | 921.59 | 3 |
| Yalata | 18 | Ceduna | 1067.93 | 4 |
| Flinders & Far North | 19 | Port Augusta | 887.51 | 1 |
| Coober Pedy (DC) | 19 | Port Augusta | 989.79 | 2 |
| Ernabella (Pukatja) & Anilalya | 19 | Port Augusta | 1092.22 | 3 |
| Mimili | 19 | Port Augusta | 1234.97 | 4 |

| Indigenous Area | AREG CODE | ATSIC Region | REMOTE INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Broome: Town | 21 | Broome | 845.69 | 1 |
| Broome: Djarindjin (Lombadina) | 21 | Broome | 989.95 | 2 |
| Broome: Bardi (One Arm Pt) | 21 | Broome | 996.03 | 3 |
| Broome: Beagle Bay | 21 | Broome | 1017.81 | 4 |
| Broome: Balance | 21 | Broome | 1052.86 | 5 |
| Broome: Bidyadanga | 21 | Broome | 1082.98 | 6 |
| Wyndham-EKimb: Kununurra | 22 | Kununurra | 863.60 | 1 |
| Wyndham-EKimb: Wyndham | 22 | Kununurra | 884.98 | 2 |
| Halls Creek: Town | 22 | Kununurra | 914.09 | 3 |
| Wyndham-EKimb: Eastern balance | 22 | Kununurra | 922.22 | 4 |
| Halls Creek: Warmun (Balingarri) | 22 | Kununurra | 1050.53 | 5 |
| Wyndham-EKimb: Western balance | 22 | Kununurra | 1064.18 | 6 |
| Halls Creek: Northern balance | 22 | Kununurra | 1076.52 | 7 |
| Halls Creek: Southern balance | 22 | Kununurra | 1089.08 | 8 |
| Wyndham-EKimb: Kalumburu | 22 | Kununurra | 1107.30 | 9 |
| Halls Creek: Balgo Hills | 22 | Kununurra | 1116.64 | 10 |
| HCk: Mindibungu (Bililuna) | 22 | Kununurra | 1122.19 | 11 |
| Halls Creek: Mulan | 22 | Kununurra | 1133.04 | 12 |
| HCk:KundatDjaru(RingersSoak) | 22 | Kununurra | 1194.97 | 13 |
| East Pilbara: Newman | 23 | Warburton | 845.77 | 1 |
| East Pilbara: Punmu | 23 | Warburton | 997.10 | 2 |
| Laverton: Cosmo Newberry | 23 | Warburton | 1011.71 | 3 |
| Wiluna (S)/Meekatharra(S): Nth | 23 | Warburton | 1020.12 | 4 |
| East Pilbara: East | 23 | Warburton | 1033.33 | 5 |
| Laverton/Menzies/Kalg.East | 23 | Warburton | 1037.50 | 6 |
| East Pilbara: Jigalong | 23 | Warburton | 1098.34 | 7 |
| Ngaanyatjarraku: Tjukurla | 23 | Warburton | 1104.70 | 8 |
| Ngaanyatjarraku: Balance | 23 | Warburton | 1110.14 | 9 |
| Ngaanyatjarraku: Warburton | 23 | Warburton | 1114.89 | 10 |
| Ngaanyatjarraku: Irrunytju | 23 | Warburton | 1116.72 | 11 |
| Ngaanyatjarraku: Wannan | 23 | Warburton | 1119.88 | 12 |
| Ngaanyatjarraku: Papulankutja | 23 | Warburton | 1121.46 | 13 |
| East Pilbara: Kiwirrkurra | 23 | Warburton | 1186.16 | 14 |
| East Campion | 24 | Narrogin | 859.99 | 1 |
| Roebourne: Karratha | 25 | South Hedland | 826.02 | 1 |
| Roebourne: Wickham | 25 | South Hedland | 838.42 | 2 |
| Port Hedland (T): Town | 25 | South Hedland | 850.04 | 3 |
| Roebourne: Roebourne town | 25 | South Hedland | 900.08 | 4 |
| Roebourne: Balance | 25 | South Hedland | 934.74 | 5 |
| Ashburton | 25 | South Hedland | 934.86 | 6 |
| East Pilbara: Marble Bar | 25 | South Hedland | 977.94 | 7 |
| Port Hedland (T): Balance | 25 | South Hedland | 1004.10 | 8 |
| East Pilbara: Yandearra | 25 | South Hedland | 1056.28 | 9 |
| East Pilbara: West | 25 | South Hedland | 1109.17 | 10 |
| East Pilbara: Nullagine | 25 | South Hedland | 1130.07 | 11 |
| Derby-WKimb: Derby | 26 | Derby | 891.37 | 1 |
| Derby-WKimb: Fitzroy Crossing | 26 | Derby | 1024.50 | 2 |
| Derby-WKimb: Western balance | 26 | Derby | 1047.16 | 3 |
| Derby-WKimb: Youngngora | 26 | Derby | 1061.87 | 4 |
| Derby-WKimb: Northern balance | 26 | Derby | 1081.93 | 5 |
| Derby-WKimb: Bayulu | 26 | Derby | 1082.16 | 6 |
| Derby-WKimb: Eastern balance | 26 | Derby | 1094.48 | 7 |
| Derby-WKimb: Looma | 26 | Derby | 1098.63 | 8 |
| Derby-WKimb: Mowanjum | 26 | Derby | 1110.87 | 9 |
| Derby-WKimb: Southern balance | 26 | Derby | 1115.56 | 10 |
| Derby-WKimb: Wangkatjunka | 26 | Derby | 1139.28 | 11 |
| Esperance (S) | 27 | Kalgoorlie | 829.96 | 1 |
| Dundas (S) | 27 | Kalgoorlie | 868.24 | 2 |
| Leonora (S) | 27 | Kalgoorlie | 898.24 | 3 |
| Laverton (S): Western balance | 27 | Kalgoorlie | 928.01 | 4 |
| Kalgoorlie: West/Menzies: West | 27 | Kalgoorlie | 957.74 | 5 |

| Indigenous Area | AREG CODE | ATSIC Region | REMOTE INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Yalgoo/Morawa/Perenjori | 28 | Geraldton | 863.50 | 1 |
| Carnarvon (S): Town | 28 | Geraldton | 883.11 | 2 |
| Meekatharra (S): Southwest | 28 | Geraldton | 883.44 | 3 |
| Cue/Sandstone/Mt Magnet | 28 | Geraldton | 886.01 | 4 |
| Meekatharra (S): Town | 28 | Geraldton | 886.64 | 5 |
| Shark Bay (S)/Murchison (S) | 28 | Geraldton | 891.60 | 6 |
| Gascoyne | 28 | Geraldton | 924.91 | 7 |
| Carnarvon (S): Mungullah | 28 | Geraldton | 1078.06 | 8 |
| Ross | 30 | Alice Springs | 842.66 | 1 |
| Larapinta | 30 | Alice Springs | 853.19 | 2 |
| Heavitree | 30 | Alice Springs | 888.02 | 3 |
| Charles | 30 | Alice Springs | 889.77 | 4 |
| Stuart | 30 | Alice Springs | 894.12 | 5 |
| Sandover Balance part A | 30 | Alice Springs | 984.09 | 6 |
| Amoonguna | 30 | Alice Springs | 991.55 | 7 |
| Jabiru (T)/South Alligator | 31 | Jabiru | 897.68 | 1 |
| Minjilang | 31 | Jabiru | 935.64 | 2 |
| Pirlangimpi | 31 | Jabiru | 960.30 | 3 |
| Nauiyu Nambiyu | 31 | Jabiru | 1013.41 | 4 |
| Daly balance/Pine Ck/Peppi | 31 | Jabiru | 1013.93 | 5 |
| Nguiu | 31 | Jabiru | 1014.06 | 6 |
| Milikapiti | 31 | Jabiru | 1016.49 | 7 |
| Warruwi | 31 | Jabiru | 1018.60 | 8 |
| Wadeye | 31 | Jabiru | 1026.39 | 9 |
| Kunbarllanjnja - Oenpelli | 31 | Jabiru | 1037.04 | 10 |
| Maningrida | 31 | Jabiru | 1080.97 | 11 |
| Maningrida outstations | 31 | Jabiru | 1105.82 | 12 |
| Kunbarllanjnja o/s/W Arn bal. | 31 | Jabiru | 1173.07 | 13 |
| Palumpa - Nganmarriyanga | 31 | Jabiru | 1188.33 | 14 |
| Katherine rural areas | 32 | Katherine | 851.10 | 1 |
| Central Katherine | 32 | Katherine | 852.02 | 2 |
| Elsey balance/Mataranka | 32 | Katherine | 918.03 | 3 |
| Binjari | 32 | Katherine | 1000.73 | 4 |
| Kalano | 32 | Katherine | 1005.17 | 5 |
| Bulman | 32 | Katherine | 1011.60 | 6 |
| Barunga Manyallaluk | 32 | Katherine | 1014.61 | 7 |
| Kalkarinji | 32 | Katherine | 1017.09 | 8 |
| Lajamanu | 32 | Katherine | 1018.07 | 9 |
| West Arnhem balance part B | 32 | Katherine | 1032.90 | 10 |
| Borroloola | 32 | Katherine | 1035.21 | 11 |
| Wugularr | 32 | Katherine | 1046.47 | 12 |
| Timber Creek | 32 | Katherine | 1059.88 | 13 |
| Minyeri & Yugul Mangi bal | 32 | Katherine | 1085.81 | 14 |
| Borroloola surrounds | 32 | Katherine | 1089.14 | 15 |
| Walangeri Ngumpinku | 32 | Katherine | 1096.23 | 16 |
| Gulf balance | 32 | Katherine | 1099.22 | 17 |
| Victoria balance | 32 | Katherine | 1103.20 | 18 |
| Ngukurr | 32 | Katherine | 1132.23 | 19 |
| Jilkminggan | 32 | Katherine | 1141.20 | 20 |
| Dagaragu | 32 | Katherine | 1158.51 | 21 |
| Yulara/Mutijulu | 33 | Aputula | 966.21 | 1 |
| Atitjere | 33 | Aputula | 969.72 | 2 |
| Haasts Bluff | 33 | Aputula | 991.55 | 3 |
| Walungurru | 33 | Aputula | 1010.53 | 4 |
| Yuendumu | 33 | Aputula | 1020.16 | 5 |
| Kaltukatjara | 33 | Aputula | 1024.11 | 6 |
| Petermann balance | 33 | Aputula | 1024.89 | 7 |
| Wallace Rockhole | 33 | Aputula | 1028.27 | 8 |
| Watiyawanu | 33 | Aputula | 1031.17 | 9 |
| Areyonga | 33 | Aputula | 1038.45 | 10 |
| Urapuntja | 33 | Aputula | 1040.17 | 11 |
| Aputula | 33 | Aputula | 1043.40 | 12 |
| Ltyentye Purte (Santa Teresa) | 33 | Aputula | 1057.78 | 13 |
| Papunya | 33 | Aputula | 1062.21 | 14 |
| Tapatjatjaka | 33 | Aputula | 1062.61 | 15 |
| Sandover balance part B | 33 | Aputula | 1069.87 | 16 |
| Tanami balance | 33 | Aputula | 1070.47 | 17 |
| Anmatjere CGC | 33 | Aputula | 1078.78 | 18 |
| Nyirripi | 33 | Aputula | 1093.21 | 19 |
| Hermannsburg | 33 | Aputula | 1101.04 | 20 |
| Hermannsburg outstations | 33 | Aputula | 1126.01 | 21 |
| Ampilatwatja | 33 | Aputula | 1134.62 | 22 |
| Imanpa | 33 | Aputula | 1150.72 | 23 |
| Willowra | 33 | Aputula | 1212.00 | 24 |
| Yuelamu | 33 | Aputula | 1236.05 | 25 |

| Indigenous Area | AREG CODE | ATSIC Region | REMOTE INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Nhulunbuy (T) | 34 | Nhulunbuy | 795.42 | 1 |
| Alyangula/Bal Groote | 34 | Nhulunbuy | 798.19 | 2 |
| Milyakburra | 34 | Nhulunbuy | 1016.68 | 3 |
| Angurugu | 34 | Nhulunbuy | 1030.91 | 4 |
| Ramingining outstations | 34 | Nhulunbuy | 1046.16 | 5 |
| Numbulwar | 34 | Nhulunbuy | 1049.38 | 6 |
| Ramingining | 34 | Nhulunbuy | 1056.06 | 7 |
| Yirrkala | 34 | Nhulunbuy | 1072.90 | 8 |
| Umbakumba | 34 | Nhulunbuy | 1075.60 | 9 |
| Gapuwiyak | 34 | Nhulunbuy | 1079.44 | 10 |
| Galiwinku | 34 | Nhulunbuy | 1108.71 | 11 |
| Marngarr | 34 | Nhulunbuy | 1109.42 | 12 |
| Galiwinku outstations | 34 | Nhulunbuy | 1112.95 | 13 |
| Laynhapuy homelands | 34 | Nhulunbuy | 1116.92 | 14 |
| Milingimbi | 34 | Nhulunbuy | 1130.51 | 15 |
| Gapuwiyak outstations | 34 | Nhulunbuy | 1218.34 | 16 |
| Tennant Creek town excl camps | 35 | Tennant Creek | 874.47 | 1 |
| Tennant Creek - Bal | 35 | Tennant Creek | 1035.35 | 2 |
| Marla Marla/Nyinkkanyunyu | 35 | Tennant Creek | 1052.69 | 3 |
| Ngalpa Ngalpa/Wuppa/Tingkkarli | 35 | Tennant Creek | 1055.15 | 4 |
| Elliott | 35 | Tennant Creek | 1077.62 | 5 |
| Ali Curung | 35 | Tennant Creek | 1078.63 | 6 |
| Tableland balance | 35 | Tennant Creek | 1084.64 | 7 |
| Epenarra | 35 | Tennant Creek | 1106.79 | 8 |
| Alpurrurulam | 35 | Tennant Creek | 1112.10 | 9 |
| Partalki/Wartijipalkari | 35 | Tennant Creek | 1127.48 | 10 |
| Canteen Creek | 35 | Tennant Creek | 1163.58 | 11 |

# MODERATELY ACCESSIBLE AREAS

| Indigenous Area | AREG CODE | ATSIC Region | INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Bega Valley (A) | 1 | Queanbeyan | 956.07 | 1 |
| Northern Slopes balance | 5 | Tamworth | 921.97 | 1 |
| Narrabri (A): Narrabri Town | 5 | Tamworth | 966.42 | 2 |
| Narrabri (A): Balance | 5 | Tamworth | 976.04 | 3 |
| Moree Plains (A): Balance | 5 | Tamworth | 1031.67 | 4 |
| Narrabri (A): Wee Waa | 5 | Tamworth | 1041.88 | 5 |
| Moree Plains (A): Moree Town | 5 | Tamworth | 1067.47 | 6 |
| Moree Plains (A): Boggabilla | 5 | Tamworth | 1095.01 | 7 |
| Moree Plains (A): Toomelah | 5 | Tamworth | 1106.71 | 8 |
| Narromine (A): Balance | 6 | Wagga Wagga | 905.17 | 1 |
| Lachlan (A): Balance | 6 | Wagga Wagga | 934.62 | 2 |
| Carrathool /Murrumbidgee | 6 | Wagga Wagga | 948.03 | 3 |
| Gilgandra (A) | 6 | Wagga Wagga | 992.89 | 4 |
| Balranald (A)/Hay (A) | 6 | Wagga Wagga | 996.27 | 5 |
| Coonabarabran (A) | 6 | Wagga Wagga | 1022.83 | 6 |
| Lachlan (A): Condobolin | 6 | Wagga Wagga | 1038.81 | 7 |
| Warren (A) | 6 | Wagga Wagga | 1051.53 | 8 |
| E. Gippsland (S) balance | 7 | Wangarata | 926.32 | 1 |
| Douglas (S): Balance | 10 | Cairns | 925.21 | 1 |
| Cairns (C): Pt B Balance | 10 | Cairns | 929.02 | 2 |
| Johnstone (S): Balance | 10 | Cairns | 972.25 | 3 |
| Atherton (S) | 10 | Cairns | 979.93 | 4 |
| Eacham (S) | 10 | Cairns | 985.67 | 5 |
| Cairns (C): Gordonvale | 10 | Cairns | 1003.02 | 6 |
| Johnstone (S): Innisfail | 10 | Cairns | 1014.78 | 7 |
| Herberton (S) | 10 | Cairns | 1015.71 | 8 |
| Mareeba (S): Balance | 10 | Cairns | 1034.77 | 9 |
| Douglas (S): Mossman | 10 | Cairns | 1065.66 | 10 |
| Mareeba (S): Mareeba Town | 10 | Cairns | 1074.59 | 11 |
| Mareeba (S): Kuranda | 10 | Cairns | 1111.74 | 12 |
| Cairns (C): Yarrabah | 10 | Cairns | 1235.65 | 13 |
| Emerald (S) | 13 | Rockhampton | 893.31 | 1 |
| Duaringa (S): Balance | 13 | Rockhampton | 916.72 | 2 |
| North Wide Bay | 13 | Rockhampton | 969.16 | 3 |
| Duaringa (S): Woorabinda | 13 | Rockhampton | 1225.46 | 4 |
| Roma (T) | 14 | Roma | 942.22 | 1 |
| Eastern Roma region | 14 | Roma | 957.96 | 2 |
| Burdekin (S): Balance | 16 | Townsville | 899.55 | 1 |
| Nebo(S)/Mirani(S)/Mackay(C)Bal | 16 | Townsville | 910.22 | 2 |
| Sarina (S) | 16 | Townsville | 914.28 | 3 |
| Whitsunday (S) | 16 | Townsville | 922.15 | 4 |
| Bowen (S): Bowen Town | 16 | Townsville | 929.83 | 5 |
| Hinchinbrook (S): Balance | 16 | Townsville | 930.03 | 6 |
| Mackay (C) Pt A SLA | 16 | Townsville | 942.92 | 7 |
| Charters Towers (C) | 16 | Townsville | 998.11 | 8 |
| Burdekin (S): Ayr | 16 | Townsville | 1006.81 | 9 |
| Cardwell (S): Balance | 16 | Townsville | 1030.29 | 10 |
| Hinchinbrook (S): Ingham | 16 | Townsville | 1069.11 | 11 |
| Cardwell (S): Tully | 16 | Townsville | 1079.37 | 12 |
| Hinchinbrook (S): Palm Island | 16 | Townsville | 1263.61 | 13 |
| Berri/Barmera/Renmark | 17 | Adelaide | 916.38 | 1 |
| Bal Riverland | 17 | Adelaide | 1000.27 | 2 |
| Yorke peninsula | 17 | Adelaide | 1007.03 | 3 |
| Upper North | 19 | Port Augusta | 965.30 | 1 |
| Manjimup (S)/Denmark (S) | 24 | Narrogin | 882.41 | 1 |
| North Avon/West Campion | 24 | Narrogin | 920.91 | 2 |
| South Lakes | 24 | Narrogin | 931.22 | 3 |
| Moora | 24 | Narrogin | 974.62 | 4 |
| North Hotham/North Lakes | 24 | Narrogin | 980.55 | 5 |
| South Pallinup | 24 | Narrogin | 985.00 | 6 |
| Narrogin (T)/Narrogin (S) | 24 | Narrogin | 991.00 | 7 |
| South Avon | 24 | Narrogin | 1010.47 | 8 |
| Plantagenet (S) | 24 | Narrogin | 1014.58 | 9 |
| Katanning (S)/Broomehill (S) | 24 | Narrogin | 1028.56 | 10 |
| Coolgardie: Balance | 27 | Kalgoorlie | 973.19 | 1 |
| Kalgoorlie/Boulder: Town | 27 | Kalgoorlie | 980.18 | 2 |
| Coolgardie: Town | 27 | Kalgoorlie | 1058.06 | 3 |
| Kalgoorlie/Boulder: Ninga Mia | 27 | Kalgoorlie | 1506.07 | 4 |
| W. Greenough River | 28 | Geraldton | 956.13 | 1 |
| Northampton/Chapman Valley | 28 | Geraldton | 963.72 | 2 |
| Mullewa (S) | 28 | Geraldton | 1080.71 | 3 |
| Western Tasmania | 29 | Hobart | 816.94 | 1 |
| Northeast Tasmania | 29 | Hobart | 861.73 | 2 |
| Litchfield | 36 | Darwin | 921.58 | 1 |
| Coomalie CGC | 36 | Darwin | 976.58 | 2 |
| Belyuen & outstations | 36 | Darwin | 1168.07 | 3 |

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# ACCESSIBLE AREAS

| Indigenous Area | AREG CODE | ATSIC Region | INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Southern Tablelands | 1 | Queanbeyan | 824.24 | 1 |
| Tuggeranong/ACT Balance | 1 | Queanbeyan | 849.61 | 2 |
| N Canberra/Belconnen/Gungahlin | 1 | Queanbeyan | 906.16 | 3 |
| Goulburn (C) | 1 | Queanbeyan | 932.14 | 4 |
| Woden/Weston/South Canberra | 1 | Queanbeyan | 936.77 | 5 |
| Wingecaribee (A) | 1 | Queanbeyan | 938.49 | 6 |
| Lachlan (A)/Yass (A) | 1 | Queanbeyan | 952.12 | 7 |
| Shoalhaven: Balance | 1 | Queanbeyan | 996.70 | 8 |
| Queanbeyan (C) | 1 | Queanbeyan | 997.01 | 9 |
| Wreck Bay (Jervis Bay) | 1 | Queanbeyan | 1037.83 | 10 |
| Shoalhaven: Bomaderry-N. Nowra | 1 | Queanbeyan | 1056.89 | 11 |
| Shoalhaven: St Georges Basin | 1 | Queanbeyan | 1075.77 | 12 |
| Eurobodalla (A): Balance | 1 | Queanbeyan | 1084.61 | 13 |
| Eurobodalla(A): Batemans Bay | 1 | Queanbeyan | 1105.13 | 14 |
| Shoalhaven: Nowra | 1 | Queanbeyan | 1150.68 | 15 |
| Broken Hill (C) | 2 | Bourke | 1066.75 | 1 |
| Wentworth (A): Balance | 2 | Bourke | 1185.79 | 2 |
| Gosford (C) | 3 | Coffs Harbour | 925.21 | 1 |
| Byron (A) | 3 | Coffs Harbour | 931.79 | 2 |
| Cessnock: Cessnock-Bellbird | 3 | Coffs Harbour | 954.24 | 3 |
| Pt Stephens: Balance | 3 | Coffs Harbour | 964.61 | 4 |
| Cessnock: Balance | 3 | Coffs Harbour | 964.88 | 5 |
| Tweed Pt A: Kingscliff/Fingal | 3 | Coffs Harbour | 964.93 | 6 |
| Singleton (A) | 3 | Coffs Harbour | 969.75 | 7 |
| Great Lakes: Bal/Dungog (A) | 3 | Coffs Harbour | 971.76 | 8 |
| Wyong (A) | 3 | Coffs Harbour | 974.17 | 9 |
| Newcastle (C) | 3 | Coffs Harbour | 984.24 | 10 |
| Lake Macquarie (C) | 3 | Coffs Harbour | 998.38 | 11 |
| Tweed Pt B | 3 | Coffs Harbour | 1001.28 | 12 |
| Nymboida/Ulmarra | 3 | Coffs Harbour | 1012.81 | 13 |
| Grafton (C) | 3 | Coffs Harbour | 1014.32 | 14 |
| Maitland (C) | 3 | Coffs Harbour | 1016.58 | 15 |
| Bellingen (A) | 3 | Coffs Harbour | 1026.81 | 16 |
| Tweed Pt A: Balance | 3 | Coffs Harbour | 1028.37 | 17 |
| Coffs Harbour (A): Balance | 3 | Coffs Harbour | 1030.47 | 18 |
| Coffs Harbour (A): Town area | 3 | Coffs Harbour | 1045.06 | 19 |
| Hastings (A) | 3 | Coffs Harbour | 1049.49 | 20 |
| Lismore (C) | 3 | Coffs Harbour | 1054.73 | 21 |
| Pt Stephens: Raymond Terrace | 3 | Coffs Harbour | 1057.56 | 22 |
| Hastings (A): Pt Macquarie | 3 | Coffs Harbour | 1072.11 | 23 |
| Walcha (A)/Gloucester (A) | 3 | Coffs Harbour | 1074.36 | 24 |
| Ballina (A): Ballina town | 3 | Coffs Harbour | 1076.24 | 25 |
| Copmanhurst/Richmond R | 3 | Coffs Harbour | 1086.26 | 26 |
| Nambucca: Nambucca Heads | 3 | Coffs Harbour | 1091.30 | 27 |
| Great Lakes: Forster-Tuncurry | 3 | Coffs Harbour | 1098.27 | 28 |
| Ballina (A): Balance | 3 | Coffs Harbour | 1104.42 | 29 |
| Kempsey (A): Balance | 3 | Coffs Harbour | 1106.77 | 30 |
| Maclean (A) | 3 | Coffs Harbour | 1113.84 | 31 |
| Taree (C): Balance | 3 | Coffs Harbour | 1121.42 | 32 |
| Nambucca: Balance | 3 | Coffs Harbour | 1129.72 | 33 |
| Taree (C): Taree town | 3 | Coffs Harbour | 1130.27 | 34 |
| Kempsey (A): Kempsey town | 3 | Coffs Harbour | 1159.34 | 35 |
| Casino (A) | 3 | Coffs Harbour | 1167.58 | 36 |
| Coffs Harbour (A): Sawtell | 3 | Coffs Harbour | 1179.42 | 37 |
| Kyogle (A) | 3 | Coffs Harbour | 1184.84 | 38 |
| Taree (C): Purfleet | 3 | Coffs Harbour | 1362.10 | 39 |

| Indigenous Area | AREG CODE | ATSIC Region | INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Lower Northern Sydney | 4 | Sydney | 737.12 | 1 |
| Hornsby-Ku-ring-gai | 4 | Sydney | 782.30 | 2 |
| Waverley (A)/Woollahra (A) | 4 | Sydney | 794.65 | 3 |
| Penrith: Emu Plains | 4 | Sydney | 796.35 | 4 |
| Baulkham Hills (A) | 4 | Sydney | 797.46 | 5 |
| Rockdale (C) | 4 | Sydney | 812.59 | 6 |
| Northern Beaches | 4 | Sydney | 817.06 | 7 |
| Ryde (C)/Hunter's Hill (A) | 4 | Sydney | 818.47 | 8 |
| Blue Mountains (C): Balance | 4 | Sydney | 832.19 | 9 |
| Sutherland Shire (A) | 4 | Sydney | 839.49 | 10 |
| Inner Western Sydney | 4 | Sydney | 841.71 | 11 |
| Wollondilly (A) | 4 | Sydney | 849.59 | 12 |
| Kiama (A) | 4 | Sydney | 858.21 | 13 |
| Penrith: St Clair | 4 | Sydney | 875.78 | 14 |
| Hurstville (C) | 4 | Sydney | 881.38 | 15 |
| Hawkesbury (C): Balance | 4 | Sydney | 884.69 | 16 |
| Kogarah (A) | 4 | Sydney | 893.15 | 17 |
| Blacktown (C): Plmptn/Glendg/Rooty | 4 | Sydney | 893.53 | 18 |
| Ashfield (A) | 4 | Sydney | 893.87 | 19 |
| Randwick (C): Balance | 4 | Sydney | 898.29 | 20 |
| Campbelltown: Balance | 4 | Sydney | 899.53 | 21 |
| Camden (A) | 4 | Sydney | 903.36 | 22 |
| Blue Mountains (C): Hazelbrook | 4 | Sydney | 903.97 | 23 |
| Holroyd (C) | 4 | Sydney | 919.53 | 24 |
| Penrith: Balance | 4 | Sydney | 924.24 | 25 |
| Blacktown (C):Quakers Hill/M'yong | 4 | Sydney | 924.68 | 26 |
| Sydney (C) | 4 | Sydney | 925.08 | 27 |
| Blacktown (C): Eastern Ck/M'bury | 4 | Sydney | 927.46 | 28 |
| Botany (A) | 4 | Sydney | 935.24 | 29 |
| Blue Mountains (C): Katoomba | 4 | Sydney | 936.39 | 30 |
| Penrith: Inner | 4 | Sydney | 936.67 | 31 |
| Penrith: St Marys/Colyton | 4 | Sydney | 953.57 | 32 |
| Bankstown (C) | 4 | Sydney | 955.51 | 33 |
| Campbelltown: Inner | 4 | Sydney | 955.55 | 34 |
| Auburn (A) | 4 | Sydney | 956.05 | 35 |
| Parramatta (C) | 4 | Sydney | 956.47 | 36 |
| Blacktown (C): Lalor Pk/KLang/P'lea | 4 | Sydney | 962.09 | 37 |
| Penrith: Kingswood/Werrington | 4 | Sydney | 964.26 | 38 |
| Leichhardt (A) | 4 | Sydney | 970.45 | 39 |
| Wollongong (C) | 4 | Sydney | 970.58 | 40 |
| South Sydney (C): Balance | 4 | Sydney | 974.39 | 41 |
| Canterbury (C) | 4 | Sydney | 975.29 | 42 |
| Marrickville (A) | 4 | Sydney | 978.35 | 43 |
| Hawkesbury (C): Richmond | 4 | Sydney | 984.38 | 44 |
| Blacktown (C): Mt Druitt | 4 | Sydney | 1003.93 | 45 |
| Campbelltown: Raby-Claymore | 4 | Sydney | 1009.02 | 46 |
| Liverpool (C) | 4 | Sydney | 1010.15 | 47 |
| Shellharbour (A) | 4 | Sydney | 1012.55 | 48 |
| Fairfield (C) | 4 | Sydney | 1012.98 | 49 |
| Penrith: Mt Pleasant | 4 | Sydney | 1016.52 | 50 |
| Campbelltown: Minto | 4 | Sydney | 1021.05 | 51 |
| Randwick (C): La Perouse | 4 | Sydney | 1021.05 | 52 |
| Blacktown (C): Seven Hills | 4 | Sydney | 1037.02 | 53 |
| Blacktown (C): Doonside | 4 | Sydney | 1048.69 | 54 |
| Blacktown (C): Willmot/Riverstone | 4 | Sydney | 1055.91 | 55 |
| Blacktown (C): Dharruk/Hebersham | 4 | Sydney | 1084.41 | 56 |
| Campbelltown: Macquarie Fields | 4 | Sydney | 1109.43 | 57 |
| Campbelltown: Ambarvale/Rosemdw | 4 | Sydney | 1114.31 | 58 |
| Blacktown (C): Shalvey | 4 | Sydney | 1131.29 | 59 |
| Blacktown (C): Emerton/Blackett | 4 | Sydney | 1138.64 | 60 |
| Blacktown (C): Lethbridge Park | 4 | Sydney | 1152.23 | 61 |
| Blacktown (C): Whalan | 4 | Sydney | 1160.83 | 62 |
| South Sydney (C): Waterloo | 4 | Sydney | 1190.78 | 63 |
| South Sydney (C): Redfern | 4 | Sydney | 1204.16 | 64 |
| Campbelltown: Airds | 4 | Sydney | 1231.93 | 65 |
| Blacktown (C): Bidwill | 4 | Sydney | 1232.89 | 66 |
| Blacktown (C): Tregear | 4 | Sydney | 1242.30 | 67 |
| Quirindi (A)/Murrurundi (A) | 5 | Tamworth | 952.87 | 1 |
| Parry (A)/Nundle (A) | 5 | Tamworth | 963.69 | 2 |
| Scone (A)/Merriwa (A) | 5 | Tamworth | 990.91 | 3 |
| Dumaresq (A)/Uralla (A) | 5 | Tamworth | 996.04 | 4 |
| Muswellbrook (A) | 5 | Tamworth | 1002.98 | 5 |
| Armidale (C) | 5 | Tamworth | 1049.69 | 6 |
| Tamworth (C) | 5 | Tamworth | 1080.91 | 7 |
| Gunnedah (A): Balance | 5 | Tamworth | 1104.74 | 8 |
| Gunnedah (A): Gunnedah Town | 5 | Tamworth | 1125.83 | 9 |
| Tenterfield (A)/Severn (A) | 5 | Tamworth | 1146.26 | 10 |
| Guyra (A) | 5 | Tamworth | 1170.20 | 11 |
| Inverell (A) | 5 | Tamworth | 1174.56 | 12 |

| Indigenous Area | AREG CODE | ATSIC Region | INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Greater Lithgow (C) | 6 | Wagga Wagga | 961.17 | 1 |
| Temora /Coolamon /Bland | 6 | Wagga Wagga | 969.42 | 2 |
| Central Murray | 6 | Wagga Wagga | 979.94 | 3 |
| Gundagai /Junee /Cootamundra | 6 | Wagga Wagga | 982.12 | 4 |
| Bathurst (C) | 6 | Wagga Wagga | 991.28 | 5 |
| Narromine (A): Narromine town | 6 | Wagga Wagga | 994.22 | 6 |
| Upper Murray | 6 | Wagga Wagga | 1002.70 | 7 |
| Central Tablelands | 6 | Wagga Wagga | 1018.19 | 8 |
| Rylstone /Mudgee /Coolah | 6 | Wagga Wagga | 1030.23 | 9 |
| Cowra (A) | 6 | Wagga Wagga | 1034.00 | 10 |
| Parkes (A): Parkes town | 6 | Wagga Wagga | 1040.99 | 11 |
| Wagga Wagga (C) | 6 | Wagga Wagga | 1042.11 | 12 |
| Young /Weddin /Harden | 6 | Wagga Wagga | 1047.38 | 13 |
| Orange (C) | 6 | Wagga Wagga | 1051.21 | 14 |
| Leeton (A) | 6 | Wagga Wagga | 1063.54 | 15 |
| Wellington (A): Balance | 6 | Wagga Wagga | 1064.66 | 16 |
| Dubbo (C) | 6 | Wagga Wagga | 1068.66 | 17 |
| Tumut (A) | 6 | Wagga Wagga | 1070.91 | 18 |
| Griffith (C) | 6 | Wagga Wagga | 1076.01 | 19 |
| Forbes (A) | 6 | Wagga Wagga | 1076.31 | 20 |
| Albury (C) | 6 | Wagga Wagga | 1086.58 | 21 |
| Murray (A)/Deniliquin (A) | 6 | Wagga Wagga | 1099.32 | 22 |
| Parkes (A): Balance | 6 | Wagga Wagga | 1108.43 | 23 |
| Narrandera (A) | 6 | Wagga Wagga | 1118.55 | 24 |
| Wellington (A): Wellington Town | 6 | Wagga Wagga | 1120.44 | 25 |
| Manningham (C)/Nillumbik (S) | 7 | Wangaratta | 736.18 | 1 |
| South Melbourne | 7 | Wangaratta | 792.72 | 2 |
| Monash (C) | 7 | Wangaratta | 816.69 | 3 |
| Whitehorse (C) | 7 | Wangaratta | 824.82 | 4 |
| Maroondah (C) | 7 | Wangaratta | 836.77 | 5 |
| St Kilda/Prahran/Richmond | 7 | Wangaratta | 837.72 | 6 |
| Knox (C) | 7 | Wangaratta | 853.71 | 7 |
| Kingston (C) | 7 | Wangaratta | 856.54 | 8 |
| Casey (C) | 7 | Wangaratta | 869.08 | 9 |
| Yarra Ranges (S) | 7 | Wangaratta | 876.96 | 10 |
| Ovens-Murray | 7 | Wangaratta | 883.53 | 11 |
| Banyule (C) | 7 | Wangaratta | 888.62 | 12 |
| Mitchell (S)-South Goulburn | 7 | Wangaratta | 904.30 | 13 |
| South Gippsland-Cardinia (S) | 7 | Wangaratta | 904.50 | 14 |
| North Goulburn | 7 | Wangaratta | 917.19 | 15 |
| Frankston (C) | 7 | Wangaratta | 924.00 | 16 |
| Mornington P'sula (S) | 7 | Wangaratta | 938.05 | 17 |
| Wodonga (RC) | 7 | Wangaratta | 957.93 | 18 |
| Gr. Dandenong (C) | 7 | Wangaratta | 985.62 | 19 |
| Wellington (S) | 7 | Wangaratta | 1009.97 | 20 |
| Baw Baw (S) | 7 | Wangaratta | 1028.69 | 21 |
| La Trobe (S) | 7 | Wangaratta | 1049.26 | 22 |
| Gr. Shepparton (C) | 7 | Wangaratta | 1058.43 | 23 |
| Bairnsdale | 7 | Wangaratta | 1093.72 | 24 |
| Lake Tyers | 7 | Wangaratta | 1132.54 | 25 |
| Sth Loddon-E. Central Highlands | 8 | Ballarat | 841.10 | 1 |
| Moonee Valley (C) | 8 | Ballarat | 843.67 | 2 |
| Hobsons Bay (C) | 8 | Ballarat | 867.00 | 3 |
| Barwon | 8 | Ballarat | 891.65 | 4 |
| Wyndham (C) | 8 | Ballarat | 907.45 | 5 |
| Brimbank (C) | 8 | Ballarat | 922.76 | 6 |
| Moreland (C) | 8 | Ballarat | 926.26 | 7 |
| Greater Geelong/Queenscliffe | 8 | Ballarat | 929.68 | 8 |
| Port Phillip/Melbourne | 8 | Ballarat | 931.63 | 9 |
| Whittlesea (C) | 8 | Ballarat | 934.26 | 10 |
| Yarra (C) North | 8 | Ballarat | 944.75 | 11 |
| W. Central Highlands-Hopkins | 8 | Ballarat | 948.60 | 12 |
| Warrnambool (C) | 8 | Ballarat | 960.27 | 13 |
| Maribyrnong (C) | 8 | Ballarat | 970.39 | 14 |
| Hume (C) | 8 | Ballarat | 975.86 | 15 |
| Darebin (C) | 8 | Ballarat | 1000.15 | 16 |
| Greater Bendigo (C) | 8 | Ballarat | 1000.52 | 17 |
| North Loddon-Mallee | 8 | Ballarat | 1002.46 | 18 |
| Glenelg (S)/S. Grampians (S) | 8 | Ballarat | 1003.81 | 19 |
| Ballarat (C) | 8 | Ballarat | 1014.96 | 20 |
| Rochester & Echuca | 8 | Ballarat | 1019.78 | 21 |
| Wimmera | 8 | Ballarat | 1024.81 | 22 |
| Mildura (RC) | 8 | Ballarat | 1048.08 | 23 |
| Swan Hill (RC) | 8 | Ballarat | 1087.88 | 24 |

| Indigenous Area | AREG CODE | ATSIC Region | INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Brisbane: Western Inner | 9 | Brisbane | 855.21 | 1 |
| Brisbane: Western Outer | 9 | Brisbane | 894.43 | 2 |
| Redland: Redland Shire balance | 9 | Brisbane | 896.11 | 3 |
| Pine Rivers Shire | 9 | Brisbane | 905.43 | 4 |
| Logan: Logan City balance | 9 | Brisbane | 912.44 | 5 |
| Brisbane: Northern Inner | 9 | Brisbane | 917.46 | 6 |
| Brisbane: Southern Inner | 9 | Brisbane | 920.50 | 7 |
| Ipswich (C): Balance | 9 | Brisbane | 921.44 | 8 |
| Brisbane: City Inner - North | 9 | Brisbane | 928.60 | 9 |
| Brisbane: Southern Outer | 9 | Brisbane | 929.82 | 10 |
| Brisbane: Eastern Outer | 9 | Brisbane | 933.83 | 11 |
| Brisbane: Eastern Inner | 9 | Brisbane | 934.04 | 12 |
| Beaudesert & Boonah | 9 | Brisbane | 943.05 | 13 |
| Brisbane: Northern Outer | 9 | Brisbane | 950.17 | 14 |
| Noosa Shire | 9 | Brisbane | 952.17 | 15 |
| Gold Coast City Pt B | 9 | Brisbane | 953.58 | 16 |
| Redland: North Stradbroke Island | 9 | Brisbane | 981.59 | 17 |
| Logan: Marsden SLA | 9 | Brisbane | 981.76 | 18 |
| Esk & Kilcoy | 9 | Brisbane | 997.85 | 19 |
| Maroochy Shire | 9 | Brisbane | 998.63 | 20 |
| Brisbane: City Inner - South | 9 | Brisbane | 1005.14 | 21 |
| Caboolture Shire | 9 | Brisbane | 1021.50 | 22 |
| Gold Coast City Pt A | 9 | Brisbane | 1027.00 | 23 |
| Redcliffe City | 9 | Brisbane | 1055.53 | 24 |
| Caloundra Shire | 9 | Brisbane | 1057.35 | 25 |
| Gatton & Laidley | 9 | Brisbane | 1061.81 | 26 |
| Logan: Kingston SLA | 9 | Brisbane | 1068.06 | 27 |
| Ipswich (C): East SLA | 9 | Brisbane | 1069.21 | 28 |
| Ipswich (C): Central SLA | 9 | Brisbane | 1072.77 | 29 |
| Logan: Woodridge SLA | 9 | Brisbane | 1134.09 | 30 |
| Brisbane: Inala SLA | 9 | Brisbane | 1143.01 | 31 |
| Cairns (C): Northern Suburbs SLA | 10 | Cairns | 929.81 | 1 |
| Cairns (C): Edmonton | 10 | Cairns | 942.74 | 2 |
| Cairns (C): Western Suburbs SLA | 10 | Cairns | 943.47 | 3 |
| Cairns (C): Mt Whitfield SLA | 10 | Cairns | 952.45 | 4 |
| Cairns (C): White Rock | 10 | Cairns | 956.00 | 5 |
| Cairns (C): Barron SLA | 10 | Cairns | 1002.20 | 6 |
| Cairns (C): Bal Trinity SLA | 10 | Cairns | 1027.51 | 7 |
| Cairns (C): City SLA | 10 | Cairns | 1031.57 | 8 |
| Cairns (C): Central Suburbs SLA | 10 | Cairns | 1087.04 | 9 |
| Livingstone (S): Balance | 13 | Rockhampton | 966.99 | 1 |
| Calliope (S) | 13 | Rockhampton | 976.26 | 2 |
| Fitzroy (S) | 13 | Rockhampton | 1033.42 | 3 |
| Hervey Bay (C) | 13 | Rockhampton | 1047.26 | 4 |
| Maryborough (C) | 13 | Rockhampton | 1055.81 | 5 |
| Burnett (S) | 13 | Rockhampton | 1058.05 | 6 |
| Gladstone (C) | 13 | Rockhampton | 1059.54 | 7 |
| Rockhampton (C) | 13 | Rockhampton | 1069.11 | 8 |
| Southern Rockhampton Region | 13 | Rockhampton | 1087.76 | 9 |
| Banana (S) | 13 | Rockhampton | 1094.87 | 10 |
| Bundaberg (C) | 13 | Rockhampton | 1103.59 | 11 |
| Livingstone (S): Yeppoon | 13 | Rockhampton | 1107.17 | 12 |
| Mt Morgan (S) | 13 | Rockhampton | 1136.00 | 13 |
| Rosalie (S)/Crow's Nest (S) | 14 | Roma | 918.87 | 1 |
| Cooloola (S): Gympie | 14 | Roma | 1002.56 | 2 |
| Dalby (T) | 14 | Roma | 1019.01 | 3 |
| Nanango/Kilkivan/Wambo | 14 | Roma | 1021.73 | 4 |
| Cooloola (S): Balance | 14 | Roma | 1032.19 | 5 |
| Central Roma region | 14 | Roma | 1038.12 | 6 |
| Jondaryan (S) | 14 | Roma | 1038.73 | 7 |
| Murgon (S) Balance | 14 | Roma | 1042.28 | 8 |
| Toowoomba (C) | 14 | Roma | 1094.71 | 9 |
| Wondai (S)/Kingaroy (S) | 14 | Roma | 1153.19 | 10 |
| Warwick (S) | 14 | Roma | 1153.64 | 11 |
| Murgon (S): Cherbourg | 14 | Roma | 1378.11 | 12 |
| Townsville (C) | 16 | Townsville | 1047.01 | 1 |
| Thuringowa (C) | 16 | Townsville | 1068.10 | 2 |

| Indigenous Area | AREG CODE | ATSIC Region | INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Happy Valley (C)/Mitcham (C) | 17 | Adelaide | 843.27 | 1 |
| Tea Tree Gully (C) | 17 | Adelaide | 877.75 | 2 |
| Eastern Adelaide | 17 | Adelaide | 890.61 | 3 |
| West Adelaide | 17 | Adelaide | 926.20 | 4 |
| Fleurieu p'sula/Adelaide Hills | 17 | Adelaide | 932.23 | 5 |
| Marion (C) | 17 | Adelaide | 936.59 | 6 |
| Mid North/Barossa | 17 | Adelaide | 953.80 | 7 |
| Adelaide Central | 17 | Adelaide | 956.47 | 8 |
| South East | 17 | Adelaide | 961.97 | 9 |
| Noarlunga (C) & Willunga (DC) | 17 | Adelaide | 985.29 | 10 |
| Port Adelaide (C) | 17 | Adelaide | 990.15 | 11 |
| Hindmarsh and Woodville (C) | 17 | Adelaide | 995.33 | 12 |
| Salisbury (C) | 17 | Adelaide | 996.25 | 13 |
| Munno Para (C) & Gawler (M) | 17 | Adelaide | 1060.30 | 14 |
| Murray Bridge (RC) | 17 | Adelaide | 1065.58 | 15 |
| Enfield (C) - Pt A | 17 | Adelaide | 1087.03 | 16 |
| Bal Murray Mallee | 17 | Adelaide | 1090.36 | 17 |
| Enfield (C) - Pt B | 17 | Adelaide | 1118.49 | 18 |
| Elizabeth (C) | 17 | Adelaide | 1159.13 | 19 |
| Whyalla (C) | 19 | Port Augusta | 1050.07 | 1 |
| Port Augusta (C) | 19 | Port Augusta | 1137.19 | 2 |
| Port Pirie (C) | 19 | Port Augusta | 1291.97 | 3 |
| Wanneroo (C): Central Coastal | 20 | Perth | 811.31 | 1 |
| Wanneroo (C): South-West | 20 | Perth | 866.58 | 2 |
| Perth (C)/Vincent (T) | 20 | Perth | 878.71 | 3 |
| Central Metropolitan | 20 | Perth | 901.63 | 4 |
| Kalamunda (S) | 20 | Perth | 904.88 | 5 |
| Wanneroo (C): North-East | 20 | Perth | 938.71 | 6 |
| Stirling (C): South-Eastern | 20 | Perth | 940.94 | 7 |
| Rockingham (C) | 20 | Perth | 952.80 | 8 |
| Mundaring (S) | 20 | Perth | 958.49 | 9 |
| Melville (C) | 20 | Perth | 960.76 | 10 |
| Wanneroo (C): North-West | 20 | Perth | 962.41 | 11 |
| Canning (C) | 20 | Perth | 1003.47 | 12 |
| Bayswater (C) | 20 | Perth | 1012.54 | 13 |
| South Perth (C) | 20 | Perth | 1020.69 | 14 |
| Belmont (C) | 20 | Perth | 1026.22 | 15 |
| Stirling (C): Coastal | 20 | Perth | 1033.08 | 16 |
| Gosnells (C) | 20 | Perth | 1050.24 | 17 |
| Fremantle(C)/East Fremantle(T) | 20 | Perth | 1052.82 | 18 |
| Victoria Park (T) | 20 | Perth | 1056.61 | 19 |
| Bassendean (T) | 20 | Perth | 1062.72 | 20 |
| Stirling (C): Central | 20 | Perth | 1064.92 | 21 |
| Swan (S): Urban Areas | 20 | Perth | 1068.87 | 22 |
| Cockburn (C) | 20 | Perth | 1075.82 | 23 |
| Armadale (C) | 20 | Perth | 1078.88 | 24 |
| Swan (S): Northern Rural | 20 | Perth | 1085.31 | 25 |
| Wanneroo (C): South-East | 20 | Perth | 1094.79 | 26 |
| Mandurah (C) | 20 | Perth | 1103.26 | 27 |
| Murray/Serpentine-Jarrahdale | 20 | Perth | 1114.59 | 28 |
| Kwinana (T) | 20 | Perth | 1148.01 | 29 |
| South Preston | 24 | Narrogin | 916.78 | 1 |
| Albany (S) | 24 | Narrogin | 928.58 | 2 |
| West Hotham-Dale | 24 | Narrogin | 1004.60 | 3 |
| Blackwood | 24 | Narrogin | 1026.26 | 4 |
| Busselton (S) | 24 | Narrogin | 1064.73 | 5 |
| Bunbury (C) | 24 | Narrogin | 1067.79 | 6 |
| Northam (S)/York/Beverley | 24 | Narrogin | 1079.83 | 7 |
| Albany (T) | 24 | Narrogin | 1095.57 | 8 |
| Collie (S) | 24 | Narrogin | 1099.68 | 9 |
| Harvey (S) | 24 | Narrogin | 1129.47 | 10 |
| Northam (T) | 24 | Narrogin | 1130.05 | 11 |
| Greenough (S) | 28 | Geraldton | 1053.95 | 1 |
| Geraldton (C) | 28 | Geraldton | 1076.11 | 2 |

| Indigenous Area | AREG CODE | ATSIC Region | INDEX | RANK within AREG (1 least disadvantaged) |
|---|---|---|---|---|
| Hobart (C) | 29 | Hobart | 833.91 | 1 |
| Kingoborough (M) | 29 | Hobart | 864.58 | 2 |
| Central Coast (M) | 29 | Hobart | 884.08 | 3 |
| Devonport (C) | 29 | Hobart | 888.44 | 4 |
| Huon Valley (M) | 29 | Hobart | 889.24 | 5 |
| West Tamar (M)/Latrobe (M) | 29 | Hobart | 889.41 | 6 |
| Glenorchy (C) | 29 | Hobart | 913.58 | 7 |
| Meander Valley (M)/Kentish (M) | 29 | Hobart | 919.79 | 8 |
| Eastern Tasmania | 29 | Hobart | 930.40 | 9 |
| Clarence (C) | 29 | Hobart | 931.15 | 10 |
| Burnie (C) | 29 | Hobart | 944.01 | 11 |
| Central Tasmania | 29 | Hobart | 947.32 | 12 |
| Launceston (C) | 29 | Hobart | 976.49 | 13 |
| Brighton (M) | 29 | Hobart | 1052.38 | 14 |
| Marrara/City Rem/Winnellie | 36 | Darwin | 896.36 | 1 |
| Darwin/Inner Suburbs | 36 | Darwin | 915.62 | 2 |
| Alawa/Brinkin/Nakara | 36 | Darwin | 923.48 | 3 |
| Millner/Jingili | 36 | Darwin | 934.15 | 4 |
| Nightcliff/Rapid Creek | 36 | Darwin | 934.34 | 5 |
| Tiwi/Wanguri/Lee Point/Leanyer | 36 | Darwin | 934.83 | 6 |
| Anula/Wulagi | 36 | Darwin | 943.53 | 7 |
| Palmerston Rem/Driver/East Arm | 36 | Darwin | 957.07 | 8 |
| Karama | 36 | Darwin | 969.60 | 9 |
| Moil/Wagaman | 36 | Darwin | 972.01 | 10 |
| Malak | 36 | Darwin | 1014.70 | 11 |
| Gray | 36 | Darwin | 1062.40 | 12 |
| Moulden | 36 | Darwin | 1064.88 | 13 |
| Ludmilla/Coconut Grove | 36 | Darwin | 1080.13 | 14 |
| Bagot | 36 | Darwin | 1360.47 | 15 |

# APPENDIX 6: HOSPITAL ADMINISTRATIVE DATA AND THE INDIGENOUS HEALTH DISADVANTAGE INDEX

## *A6.1 Introduction*

250.    One of the experimental indexes constructed for the Indigenous Funding Inquiry is the health disadvantage index.   The Commonwealth Grants Commission envisions such an index to reflect differences in the health status and care of the Indigenous people across ATSIC regions.

251.    This appendix describes an ongoing investigation into the feasibility of using hospital data for constructing an Indigenous  health disadvantage index.  It looks into the characteristics of the dataset, its strengths and limitations, and examines its usefulness in a PCA-constructed index.

## *A6.2 Hospital Separations Data*

252.    The hospital separations data were obtained from the National Hospital Morbidity Database (NHMD), which is managed by the Australian Institute of Health and Welfare (AIHW).   The information in the NHMD is provided to the AIHW by health authorities in each State and Territory.   The database includes information on the characteristics, diagnoses and care of admitted patients in public and private hospitals across Australia. Permission to access, analyse and publish the data was sought and received from the relevant State and Territory authorities.

253.    Data included in the NHMD are for admitted patients (i.e. excluding outpatients) in almost all Australian hospitals, including public acute, psychiatric and repatriation hospitals as well as private acute and psychiatric hospitals and free-standing day hospital facilities.  No data were available from a few small public and private hospitals (for more details, see AIHW 1999, pp. 2–3).

254.    The data used in this report relate to hospital separations which occurred during the period 1 July 1997 to 30 June 1998.  Data for patients who appendix re-admitted on any date before 1 July 1998 are included, provided that they also separated between 1 July 1997 and 30 June 1998.   A record is included for each separation, not for each patient, so patients who separated more than once in the year have more than one record in the data.

255.    A hospital separation occurs when a patient is discharged, is transferred to another facility or dies, or when the type of care changes (from acute to rehabilitation, for example) (AIHW 1999).  Hospital statistics are based on separations rather than admissions because more information is available at the end of a patient's stay in hospital than at the beginning, such as information about diagnosis, length of stay, procedures performed, etc. Data refer to separations (that is, episodes of care) rather than to individual people.  An

individual may have been admitted to (and separated from) hospital on more than one occasion during the year, and each hospital separation would be included in the data. For example, some patients with kidney disease may have had three recorded separations each week just for their routine dialysis treatment.

256.    The conditions diagnosed and the procedures undertaken during each episode of care were coded according to the International Classification of Diseases, 9th Revision (ICD-9-CM) (National Coding Centre 1996). Principal diagnosis is defined as 'the diagnosis established after study to be chiefly responsible for occasioning the patient's episode of care in hospital', while principal procedure is defined as 'the most significant procedure that was performed for the treatment of the principal diagnosis' (National Health Data Committee 1998). Although information on additional diagnoses and procedures is available in the NHMD, variability in coding practices by hospital and/or jurisdiction (for example, in the number of additional diagnoses or procedures which can be recorded) mean that such data may not be sufficiently comparable to warrant analysis. Thus, this report presents rates by principal diagnosis only.

## A6.3  Data Issues and Quality

257.    Hospital separations data are a potentially valuable source of information about the health status and health service utilisation of the Indigenous people. The data may serve as a basis for comparing information across regions, over time and between Indigenous people and non-Indigenous people. Any comparisons however should be taken with caution as there may be inaccuracies in the recording of the indigenous status of admitted patients. Various studies have indicated that this data underestimates the number of Indigenous people actually admitted into hospital care. The issue of identification is discussed in the next section.

258.    A health disadvantage index hopes to capture differences in the health conditions of the Indigenous people across regions. Hospital separation statistics are not a measure of the prevalence of disease. The numbers represent episodes of hospitalisation rather than people. An individual may have been admitted to hospital on more than one occasion during 1997-98, and each separate hospital admission would be included in the data.

259.    In addition, each hospital admission represents a mixture of need, access, and demand. Low rates of hospitalisation may represent lower level of need (i.e. a healthier population), or they may mean existing needs are not being met (e.g. sick population with poor access). Conversely, a rising rate of hospitalisation could mean either a worsening of health status or an improvement in access.

260.    Furthermore, hospital admission policies vary from hospital to hospital and State to State, as does the availability of *outpatient* care services. A person with a particular condition may be admitted to hospital in one area but treated as a day patient or outpatient or at a doctor's surgery in another area.

### A6.4  Indigenous identification

261.    Assessments of relative Indigenous health disadvantage based on hospital separation statistics are complicated by the lack of complete identification of Indigenous people in hospital records.  This results in an underestimate of hospitalisation of Indigenous people.  For index construction purposes, this may not be a major concern if the relative degree of underestimation is uniform across the 36 ATSIC regions.  But this may not be the case.  Indigenous status information is not collected in the same manner across hospitals.  Thus the extent of underestimation may vary from ATSIC region to ATSIC region, and perhaps from disease to disease, or by age group and sex, as well as over time.

262.    ABS 4711.0 describes the manner by which information on Indigenous status is collected in hospitals.  The question used to determine the information differs from place to place.  The method of determining the response also varies, from directly asking a question of all patients, to asking only some patients, to determining the answer based on the patient's appearance.  In some cases, it is not possible to determine whether a questionnaire was in use.  The Indigenous status information is keyed in directly into the computer.  Instead of a specific question, a heading (such as 'Indigenous status') appears on the computer screen, followed by a series of options (such as 'Aboriginal', 'Torres Strait Islander', 'Both Aboriginal and Torres Strait Islander', 'Neither').  Such a  system may reduce transcription errors, but it does not tell much about  the language and practice used to assess the Indigenous status of patients.

263.    The variation in the methods used to ascertain whether or not patients are Indigenous is likely to manifest itself in the quality of the data (ABS 2000).  Although the quality of Indigenous identification in hospital records has not yet been formally assessed nationally, a few studies of individual hospitals have suggested that there is a wide range in the completeness of recording (Table A6. 1).

**Table A6-1**  SELECTED STUDIES ASSESSING DATA QUALITY OF INDIGENOUS STATUS IN HOSPITAL RECORDS

| Authors | Year of study | Location and number of hospitals | Total number of patients interviewed | Number of patients who identified as Indigenous at interview | Proportion of Indigenous people(a) correctly identified in hospital records (%) |
|---|---|---|---|---|---|
| ATSIHWIU | 1998 | 11 hospitals in 5 States and Territories | 8,276 | 648 | range 55-100% |
| Condon et al (1998) | 1997 | 5 public hospitals in the Northern Territory | 400 | 216 | 94% overall; range 92-100% |
| Shannon, Brough and Haswell-Elkins (1997) | 1997 | 2 Brisbane hospitals | 451 | 25 | 44% overall |
| Lynch and Lewis (1997) | 1997 | 2 Queensland hospitals | 1,836 | 76 | 66% and 70% |

(a) based on identification at interview
Source: ABS Cat No. 4711.0

264.    The Aboriginal and Torres Strait Islander Health and Welfare Information Unit (ATSIHWIU 1999) study is probably to date the largest study to look into the quality of Indigenous identification in hospital data.  Funded by the Australian Health Ministers' Advisory Council, the study was intended to provide some indication of the quality of data in the pilot hospitals, although it was not designed to produce national or jurisdictional estimates.

265.    The ATSIHWIU study compared the results of interviews with hospital patients with information coming from the hospital data.  Aside from the question of Indigenous status, the study also explored the quality of a broad range of demographic data collected by hospitals (e.g. date of birth, place of residence, etc).

266.    As indicated in the Table A6-1 above, the study found out that the accuracy with which the Indigenous people were accurately recorded in hospital data varied greatly from hospital to hospital, ranging from 55 percent accuracy to 100 percent accuracy.  The level of agreement between the interview and hospital records tended to be higher for hospitals outside capital cities and for those with a higher proportion of Indigenous people living in the hospital's  area.  Other demographic data items were also inaccurately and incompletely recorded, although the extent of errors in these were not as much as the error in the recording of Indigenous status.

267.    The ATSIHWIU study has also suggested factors which influence the accuracy of recording of Indigenous status.  It found that hospitals in areas which have a high proportion of Indigenous people demonstrated a greater accuracy in identifying Indigenous patients, than in areas with a lower proportion of Indigenous people.

268.    The other studies shown in Table A6-1 are less extensive in terms of hospital coverage.    However, Condon et al (1998), has shown that the hospitals in Northern Territory have a high quality data.

269.    ***Missing information on Indigenous status.***    The health index using hospital data, to be described in the sections below, is based on information about Indigenous separations only.    Separations in which Indigenous status is 'Non-Indigenous' or 'Not stated/unknown' have been excluded from the analysis.    In ABS (2000), it was noted that while there were 151,462 separations in 1997-98 that were identified as Indigenous, there were a further 685,176 separations for which Indigenous status was not reported.    Of these, 71 percent were separations from private hospitals (excluding private hospitals in Victoria, in which no information about Indigenous status was available).    How many of these 'missing' separations are Indigenous?    If most of the missing status come from private hospitals, which is accessed less frequently by Indigenous people (41 public separations per private separation), then it is possible that nationwide the missing status is accounted for primarily by non-Indigenous patients.    However, even if only a small percentage (say 2 percent) of missing data is Indigenous this translates into almost 10 percent underestimation of Indigenous separations.    Additional problems arise if the Indigenous statuses of these unidentified separations vary by region, age group, sex, diagnosis, etc.    The implications of the missing data are explained further in Attachment I.

## A6.5  Health disadvantage index based on hospital data

270.    Any health index based on hospital separations data should be treated with caution, for the reasons explained earlier in Section 3.    Although they reflect an aspect of the burden of disease in the region, hospital separations do not usually provide measures of the incidence or prevalence of conditions.    Not all persons with a type or degree of illness are treated in hospitals.    Moreover, the number and spatial pattern of hospitalisations can be influenced by differing admission practices, differing levels and patterns of service provision and multiple admissions for some chronic condition (a good example is renal dialysis).

271.    Before an index is constructed using hospital data, one important question (other than the data quality issue) to ask is:  "What indicators that reflect socioeconomic disadvantage can be extracted from it?"

272.    A preliminary set of possible indicators is shown in Table A6-2.    These indicators are based mostly on the interim set of performance indicators for Aboriginal and Torres Strait Islander health, as set out by the National Health Information Management Group for the Australian Health Ministers' Advisory Council (NHIMG  2000).    The Group has reported that to improve understanding of whether government policies and programs are making "a significant difference in  improving Aboriginal and Torres Strait Islander health", certain performance indicators should be monitored.    These indicators have included those that might come from hospital separations statistics, such as hospitalisation rates for myocardial infection, diabetes, and others, as listed in Table A6-2.

**Table A6-2**   List of health disadvantage indicators extracted        from the 1997-98 hospital data

| MALESEPS | Age-standardised morbidity rates, Indigenous males, by ATSIC Region,  where principal diagnosis = all diagnosis codes |
|---|---|
| FEMSEPS | Age-standardised morbidity rates, Indigenous females, by ATSIC Region,  where principal diagnosis = all diagnosis codes |
| MENTAL | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = Mental disorders, including alcohol and drug-related psychosis, dependence, abuse) |
| DIABETES | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = Diabetes (ICD-9 Code 250) |
| ISCHAEM | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = Ischaemic heart disease (including acute myocardial infarction) (ICD-9 Code 410-414) |
| NUTRITN | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = nutritional deficiencies (ICD-9 Code 260-269) |
| DIALYSIS | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = dialysis (ICD-9 Code V56) |
| PARASITE | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = Infectious/parasitic diseases (ICD-9 Codes 001-139) |
| PREGNANT | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = Complications of pregnancy and childbirth (ICD-9 Codes 630-677) |
| RESPIRAT | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = Respiratory diseases (ICD-9 Codes 460-519) |
| DIGESTIV | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = Digestive diseases (ICD-9 Codes 520-579) |
| INJURY | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = Injury (ICD-9 Codes 800-999 and E800-E999) |
| SUICIDE | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal external cause of injury = Self-inflicted injury, suicide (ICD-9 Codes E950-E959) |
| HOMICIDE | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal external cause of injury = Injury purposely inflicted by others, homicide (ICD-9 Codes E960-E969) |
| POISON | Age-standardised morbidity rates, Indigenous persons,  by ATSIC Region,  where principal diagnosis = Poisoning, toxic effects (ICD-9 Codes E960-E989) (Includes toxic effect of petroleum products) |
| SEPMODE6 | Mode of separation = Left against  medical advice/discharge at own risk as a proportion of total separations (%) |
| BEDDAYS | Average of length of stay (i.e. the number of days the patient was admitted for), by ATSIC region |

273.    The diseases and reasons for hospitalisation identified in Table A6-2 are also consistent with the list of health indicators in Turrell et al (1999).  The authors reviewed 202 studies to identify the multi-level and diverse determinants of socioeconomic health inequalities.  From these studies, they generalise that persons (total, not only Indigenous) who "occupy positions at lower levels of the socioeconomic hierarch" fare significantly worse in terms of health.  Specifically, persons classified under 'low' socioeconomic status have higher mortality rates for most of the diseases identified in Table A6-2, their morbidity profile indicates that they experience more ill health (both physiological and mental/psychosocial), and their use of health care services suggest that they are less likely to act to prevent disease or detect it at an asymptomatic stage.

### A6.6  Methodology

274.    The indicators listed above were computed for each of the ATSIC Region. The rates were standardised to eliminate the effects of cross-ATSIC differences in population age composition. Age can have a substantial effect on the nature of separations. For example, a region which has a predominantly older population is likely to have more separations for heart attacks than a population which is predominantly younger.

275.    ***Direct standardisation.***  In *direct* standardisation, a standard population is selected and employed in deriving the age-adjusted morbidity rates (i.e. 36 rates, by ATSIC region).  If the same standard population is employed, as required, all the 36  rates are directly comparable.   The formula calls for computing the weighted average of the age-specific morbidity rates in a given ATSIC region, using as weights the age distribution of the standard population.  The formula for an ATSIC Region's morbidity rate, using direct standardisation, is given by:

$$m_{diagnosis, ATSIC, sex} = \Sigma \{m_{ATSIC}\ SP_{age}/SP_{total}\}\ x\ 1{,}000$$

where

$$
\begin{aligned}
m_{ATSIC} \quad &=\quad Separations_{diagnosis,\ age,\ sex}\ /P_{age,\ sex} \\
&=\quad \text{age-specific hospital separation rate} \\
&\quad\ \ \text{for a particular diagnosis in the specified} \\
&\quad\ \ \text{ATSIC region;}
\end{aligned}
$$

$SP_{age}$ represents the standard population at each age group;

$SP_{total}$  represents the total standard population;  and

$P_{age,sex}$ represents an area's population at each age group, by sex (data is for 30 June 1996)

276.    Each age-specific hospital separation rate is multiplied, in effect, by the proportion of the standard population in each age group.  The standard population used is the estimated resident Indigenous population as of 30 June 1996 (ABS 3230.0.)   The computed indicators are shown in Table A6.3.

**Table A6-3** HEALTH INDICATORS EXTRACTED FROM THE 1997-98 HOSPITAL DATA[a]

| ATSIC Code | ATSIC Name | BEDDAYS | DIABETES | DIALYSIS | DIGESTIVE | FEMSEPS | HOMICIDE | INJURY | ISCHAEM |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Queanbeyan | 1 | 1.7 | 63.8 | 18.9 | 141.6 | 3.1 | 19.0 | 6.9 |
| 2 | Bourke | 2 | 6.0 | 98.3 | 65.2 | 445.0 | 21.5 | 78.4 | 11.3 |
| 3 | Coffs Harbour | 1 | 2.3 | 47.5 | 20.3 | 174.4 | 12.3 | 23.1 | 4.8 |
| 4 | Sydney | 1 | 0.7 | 17.2 | 14.2 | 95.2 | 4.0 | 10.8 | 2.3 |
| 5 | Tamworth | 2 | 3.8 | 18.3 | 31.0 | 190.9 | 15.3 | 33.5 | 6.6 |
| 6 | Wagga Wagga | 2 | 3.5 | 8.8 | 24.7 | 168.4 | 10.3 | 28.7 | 5.7 |
| 7 | Wangarata | 1 | 2.2 | 32.3 | 16.5 | 121.1 | 2.7 | 19.2 | 3.3 |
| 8 | Ballarat | 1 | 2.3 | 56.8 | 21.4 | 175.4 | 4.1 | 25.4 | 5.4 |
| 9 | Brisbane | 1 | 1.4 | 81.8 | 15.9 | 140.3 | 3.4 | 16.1 | 4.2 |
| 10 | Cairns | 1 | 7.7 | 164.3 | 26.4 | 285.3 | 13.2 | 43.3 | 9.2 |
| 11 | Mount Isa | 2 | 10.7 | 7.3 | 32.7 | 286.7 | 37.9 | 96.8 | 14.1 |
| 12 | Cooktown | 1 | 12.5 | 4.6 | 42.7 | 341.5 | 67.0 | 157.7 | 4.5 |
| 13 | Rockhampton | 1 | 3.7 | 69.2 | 24.2 | 182.0 | 9.0 | 35.6 | 6.2 |
| 14 | Roma | 2 | 5.8 | 19.9 | 28.2 | 201.9 | 9.9 | 42.0 | 6.0 |
| 15 | Torres Strait Area | 2 | 11.6 | 5.1 | 23.0 | 166.2 | 6.0 | 30.1 | 3.3 |
| 16 | Townsville | 1 | 4.6 | 138.1 | 27.7 | 257.1 | 14.3 | 43.9 | 9.5 |
| 17 | Adelaide | 1 | 5.7 | 106.9 | 22.0 | 245.8 | 9.3 | 37.1 | 6.3 |
| 18 | Ceduna | 3 | 20.9 | 0.0 | 63.5 | 433.1 | 23.6 | 72.8 | 11.8 |
| 19 | Port Augusta | 1 | 9.9 | 261.2 | 33.4 | 430.8 | 28.7 | 68.9 | 8.1 |
| 20 | Perth | 1 | 3.0 | 199.8 | 19.7 | 289.1 | 11.4 | 35.4 | 7.1 |
| 21 | Broome | 2 | 4.0 | 36.9 | 30.2 | 297.9 | 35.2 | 73.5 | 7.6 |
| 22 | Kununurra | 2 | 7.2 | 70.5 | 23.0 | 386.4 | 48.4 | 96.6 | 5.0 |
| 23 | Warburton | 1 | 6.4 | 155.1 | 24.3 | 316.4 | 36.6 | 75.0 | 0.9 |
| 24 | Narrogin | 2 | 5.3 | 34.2 | 37.9 | 244.9 | 14.0 | 40.3 | 10.1 |
| 25 | South Hedland | 2 | 70.5 | 32.3 | 34.9 | 358.0 | 39.1 | 91.1 | 4.1 |
| 26 | Derby | 2 | 9.6 | 83.9 | 28.9 | 380.2 | 47.5 | 104.1 | 7.4 |
| 27 | Kalgoorlie | 1 | 11.6 | 464.3 | 46.3 | 636.9 | 42.8 | 104.2 | 10.0 |
| 28 | Geraldton | 2 | 7.4 | 67.7 | 48.3 | 352.9 | 31.0 | 83.5 | 8.0 |
| 29 | Hobart | 4 | 0.3 | 0.0 | 5.2 | 77.3 | 0.5 | 5.7 | 1.2 |
| 30 | Alice Springs | 1 | 4.2 | 881.5 | 25.0 | 705.9 | 35.7 | 65.4 | 2.9 |
| 31 | Jabiru | 3 | 2.3 | 76.4 | 10.8 | 192.6 | 8.8 | 28.0 | 3.1 |
| 32 | Katherine | 3 | 7.1 | 37.3 | 13.4 | 218.2 | 28.2 | 50.7 | 5.6 |
| 33 | Aputula | 4 | 3.2 | 47.6 | 12.1 | 213.5 | 15.5 | 31.4 | 0.6 |
| 34 | Nhulunbuy | 3 | 0.9 | 58.9 | 14.2 | 204.3 | 9.8 | 23.6 | 4.0 |
| 35 | Tennant Creek | 2 | 8.0 | 70.1 | 24.9 | 249.2 | 26.9 | 59.7 | 5.0 |
| 36 | Darwin | 1 | 2.6 | 648.5 | 13.6 | 483.0 | 5.8 | 21.8 | 3.0 |

**Table A6-3**   HEALTH INDICATORS EXTRACTED FROM THE 1997-98 HOSPITAL
DATA[a] (cont.)

| ATSIC Code | ATSIC Name | MALESEPS | MENTAL | NUTRITN | PARASITE | POISON | PREGNANT | RESPIRAT | SEPMODE6 | SUICIDE |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Queanbeyan | 124.4 | 13.3 | 0.0 | 5.7 | 3.6 | 26.8 | 23.2 | 2.6 | 0.8 |
| 2 | Bourke | 344.5 | 44.1 | 0.3 | 19.6 | 6.6 | 58.5 | 117.1 | 3.2 | 1.0 |
| 3 | Coffs Harbour | 119.1 | 14.5 | 0.0 | 6.8 | 2.7 | 34.4 | 29.6 | 3.5 | 0.5 |
| 4 | Sydney | 71.8 | 28.0 | 0.0 | 3.3 | 1.6 | 20.7 | 11.5 | 2.4 | 0.8 |
| 5 | Tamworth | 145.5 | 21.1 | 0.2 | 9.5 | 2.6 | 45.3 | 40.8 | 3.5 | 1.6 |
| 6 | Wagga Wagga | 132.6 | 29.5 | 0.0 | 8.2 | 5.4 | 36.3 | 39.1 | 3.1 | 1.5 |
| 7 | Wangarata | 108.9 | 12.0 | 0.0 | 5.8 | 3.0 | 29.0 | 19.7 | 3.3 | 2.0 |
| 8 | Ballarat | 113.3 | 19.9 | 0.1 | 4.9 | 4.4 | 33.5 | 26.4 | 2.8 | 2.4 |
| 9 | Brisbane | 102.1 | 11.7 | 0.1 | 3.7 | 2.6 | 27.6 | 12.6 | 1.8 | 1.5 |
| 10 | Cairns | 214.1 | 15.2 | 0.5 | 11.0 | 2.8 | 48.3 | 41.9 | 2.5 | 1.7 |
| 11 | Mount Isa | 232.2 | 21.3 | 0.4 | 26.3 | 8.3 | 47.6 | 72.1 | 2.9 | 5.7 |
| 12 | Cooktown | 284.6 | 25.8 | 0.6 | 30.4 | 8.4 | 50.9 | 89.9 | 2.4 | 9.3 |
| 13 | Rockhampton | 134.5 | 9.4 | 0.0 | 6.6 | 3.4 | 35.0 | 30.8 | 3.0 | 2.0 |
| 14 | Roma | 182.7 | 23.8 | 0.1 | 13.7 | 4.7 | 42.1 | 61.5 | 2.2 | 1.2 |
| 15 | Torres Strait Area | 109.7 | 5.0 | 0.0 | 10.7 | 1.9 | 58.1 | 26.9 | 4.1 | 0.0 |
| 16 | Townsville | 197.8 | 15.5 | 0.1 | 16.1 | 3.7 | 34.3 | 40.6 | 1.9 | 3.6 |
| 17 | Adelaide | 157.7 | 25.9 | 0.0 | 8.0 | 6.5 | 38.4 | 33.2 | 2.0 | 4.6 |
| 18 | Ceduna | 315.5 | 34.9 | 2.1 | 71.2 | 7.4 | 60.5 | 116.1 | 4.9 | 0.6 |
| 19 | Port Augusta | 339.4 | 22.8 | 5.3 | 22.5 | 6.4 | 49.7 | 73.5 | 3.2 | 4.9 |
| 20 | Perth | 170.6 | 20.4 | 0.1 | 9.6 | 5.2 | 35.7 | 32.9 | 2.3 | 4.1 |
| 21 | Broome | 224.8 | 28.3 | 1.1 | 20.2 | 6.3 | 58.1 | 50.7 | 3.6 | 4.5 |
| 22 | Kununurra | 281.4 | 15.0 | 0.0 | 30.0 | 4.1 | 83.7 | 75.6 | 3.8 | 3.3 |
| 23 | Warburton | 277.9 | 7.9 | 1.7 | 31.8 | 2.1 | 28.0 | 60.0 | 2.6 | 2.8 |
| 24 | Narrogin | 175.1 | 25.5 | 0.2 | 17.0 | 3.7 | 40.9 | 64.6 | 2.7 | 2.6 |
| 25 | South Hedland | 398.9 | 23.9 | 0.0 | 25.9 | 4.1 | 64.8 | 147.7 | 3.2 | 3.7 |
| 26 | Derby | 360.1 | 23.6 | 0.0 | 39.9 | 7.4 | 64.4 | 100.0 | 3.6 | 9.5 |
| 27 | Kalgoorlie | 548.3 | 41.5 | 0.0 | 35.6 | 7.0 | 69.2 | 115.0 | 3.2 | 3.9 |
| 28 | Geraldton | 341.2 | 32.7 | 0.4 | 36.5 | 8.2 | 72.3 | 105.6 | 3.3 | 6.5 |
| 29 | Hobart | 63.2 | 2.2 | 0.1 | 0.6 | 1.0 | 8.7 | 7.6 | 12.3 | 0.5 |
| 30 | Alice Springs | 592.6 | 9.1 | 2.7 | 24.0 | 2.3 | 49.0 | 76.7 | 2.0 | 3.9 |
| 31 | Jabiru | 148.3 | 5.4 | 7.9 | 12.1 | 0.8 | 32.1 | 40.6 | 6.5 | 0.7 |
| 32 | Katherine | 163.6 | 6.3 | 2.2 | 18.5 | 1.8 | 41.3 | 47.0 | 5.8 | 1.4 |
| 33 | Aputula | 137.7 | 1.7 | 8.8 | 23.9 | 1.4 | 35.9 | 50.6 | 7.2 | 1.4 |
| 34 | Nhulunbuy | 131.6 | 2.3 | 8.5 | 24.2 | 2.3 | 35.7 | 36.7 | 6.0 | 1.6 |
| 35 | Tennant Creek | 201.7 | 6.0 | 4.0 | 22.9 | 1.0 | 49.9 | 48.0 | 4.0 | 1.9 |
| 36 | Darwin | 350.5 | 6.6 | 0.9 | 7.1 | 0.8 | 30.3 | 23.2 | 1.0 | 0.6 |

a/ per 1,000 population (except SEPMODE6 and BEDDAYS).

Data are directly age-standardised using the total estimated Indigenous resident population for 30 June 1996.

277. ***Principal Components Analysis.*** The health indicators listed above are combined to create a summary index that may be used to rank regions. Principal Components Analysis (PCA) was utilised to sieve the variables. The objective is to create an index that reflects health disadvantage. This implies that only relevant variables (i.e. those that contribute positively and significantly to the index) get retained for summarisation into one single indicator.

## A6.7  Results

### ATSIC Region index and rank based on hospital data

278. ***The rankings.*** In Figure A6-1, the rankings suggested by the hospital data are compared with the rankings suggested by the Indigenous Disadvantage Index, which made use of other indicators (such as education, employment and housing) and was based on the 1996 Census.

**Figure A6-1**  HOSPITAL DATA-BASED HEALTH INDEX VS. INDIGENOUS DISADVANTAGE INDEX  (CENSUS-BASED)
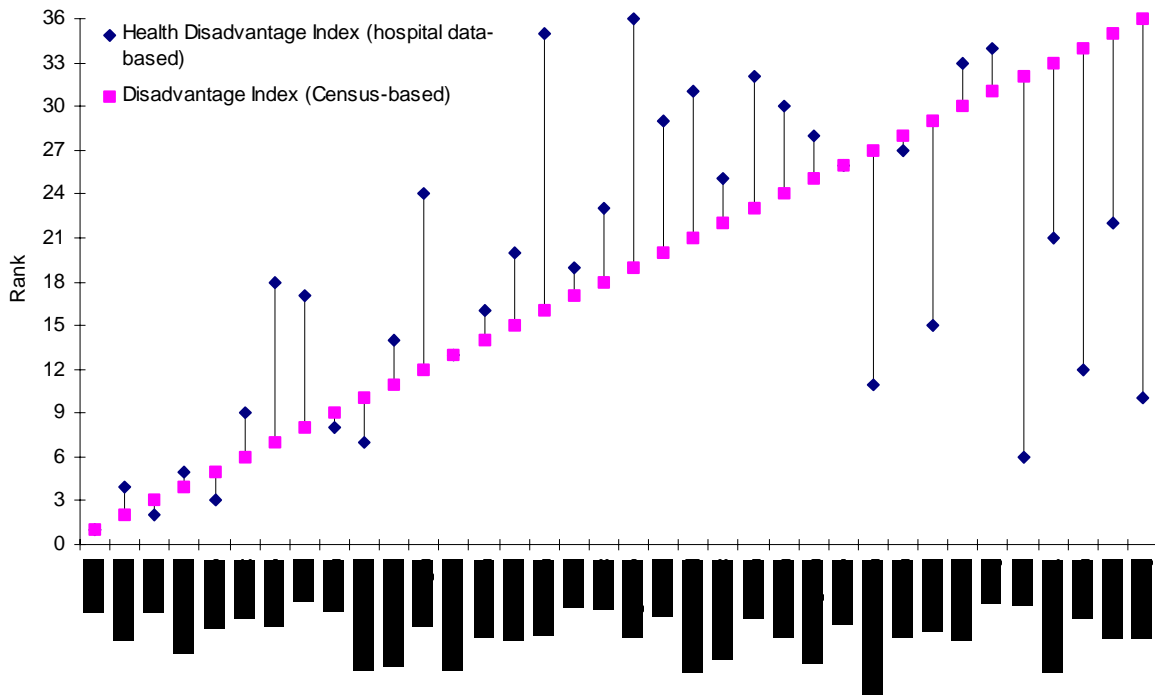


279. Table A6-4 shows the index scores and ranks of ATSIC regions, except for the ATSIC regions in NSW for which we do not have hospital data yet.

**Table A6-4**    HOSPITAL DATA-BASED HEALTH INDEX AND IMPLIED RANK

| ATSIC Code | ATSIC Name | Index | Rank (1 = least disadvantaged) |
|---|---|---|---|
| 1 | Queanbeyan | 878.06 | 5 |
| 2 | Bourke | 1113.40 | 29 |
| 3 | Coffs Harbour | 903.70 | 7 |
| 4 | Sydney | 845.11 | 2 |
| 5 | Tamworth | 981.29 | 16 |
| 6 | Wagga Wagga | 962.92 | 14 |
| 7 | Wangarata | 871.82 | 4 |
| 8 | Ballarat | 912.22 | 9 |
| 9 | Brisbane | 857.75 | 3 |
| 10 | Cairns | 1019.99 | 23 |
| 11 | Mount Isa | 1114.13 | 30 |
| 12 | Cooktown | 1137.11 | 33 |
| 13 | Rockhampton | 939.73 | 13 |
| 14 | Roma | 1007.44 | 19 |
| 15 | Torres Strait Area | 926.45 | 11 |
| 16 | Townsville | 1011.51 | 20 |
| 17 | Adelaide | 995.24 | 18 |
| 18 | Ceduna | 1130.43 | 32 |
| 19 | Port Augusta | 1102.02 | 28 |
| 20 | Perth | 982.53 | 17 |
| 21 | Broome | 1076.88 | 26 |
| 22 | Kununurra | 1091.58 | 27 |
| 23 | Warburton | 1019.74 | 22 |
| 24 | Narrogin | 1034.94 | 24 |
| 25 | South Hedland | 1124.43 | 31 |
| 26 | Derby | 1143.01 | 34 |
| 27 | Kalgoorlie | 1166.92 | 36 |
| 28 | Geraldton | 1143.57 | 35 |
| 29 | Hobart | 804.38 | 1 |
| 30 | Alice Springs | 1058.64 | 25 |
| 31 | Jabiru | 891.98 | 6 |
| 32 | Katherine | 976.46 | 15 |
| 33 | Aputula | 933.36 | 12 |
| 34 | Nhulunbuy | 916.96 | 10 |
| 35 | Tennant Creek | 1013.40 | 21 |
| 36 | Darwin | 910.88 | 8 |

280.    ***ATSIC Region index and rank based on combined hospital and non-hospital data.***    Table A6-5 shows the ranking of regions based on a health disadvantage index that was computed using the combined information from the hospital data, and health indicators from the NATSIS and perinatal statistics from the AIHW.  The index based on the combined data is compared against the Indigenous Disadvantage Index (Census-based), in Figure A6-2.

**Table A6-5**  INDEX AND RANK BASED ON COMBINED HOSPITAL AND NON-HOSPITAL DATA

| | | Health Index, based on: | | | Health Index Rank, based on: | | |
|---|---|---|---|---|---|---|---|
| ATSIC Code | ATSIC NAME | hospital data | non-hospital data | hospital plus non-hospital data | hospital data | non-hospital data | hospital plus non-hospital data |
| 1 | Queanbeyan | 878.1 | 1020.0 | 867.9 | 5 | 20 | 5 |
| 2 | Bourke | 1113.4 | 1000.3 | 1107.4 | 29 | 16 | 30 |
| 3 | Coffs Harbour | 903.7 | 1086.1 | 915.0 | 7 | 28 | 8 |
| 4 | Sydney | 845.1 | 1083.4 | 863.2 | 2 | 27 | 3 |
| 5 | Tamworth | 981.3 | 1061.1 | 978.3 | 16 | 26 | 15 |
| 6 | Wagga Wagga | 962.9 | 1053.3 | 958.2 | 14 | 25 | 14 |
| 7 | Wangaratta | 871.8 | 1117.7 | 865.3 | 4 | 33 | 4 |
| 8 | Ballarat | 912.2 | 1176.1 | 894.2 | 9 | 36 | 7 |
| 9 | Brisbane | 857.7 | 1026.6 | 840.0 | 3 | 22 | 2 |
| 10 | Cairns | 1020.0 | 955.3 | 1035.2 | 23 | 12 | 23 |
| 11 | Mount Isa | 1114.1 | 889.2 | 1105.5 | 30 | 4 | 28 |
| 12 | Cooktown | 1137.1 | 1132.5 | 1158.7 | 33 | 34 | 36 |
| 13 | Rockhampton | 939.7 | 970.2 | 928.9 | 13 | 13 | 11 |
| 14 | Roma | 1007.4 | 1025.6 | 988.0 | 19 | 21 | 17 |
| 15 | Torres Strait Area | 926.5 | 974.4 | 946.3 | 11 | 14 | 13 |
| 16 | Townsville | 1011.5 | 905.3 | 1027.9 | 20 | 9 | 22 |
| 17 | Adelaide | 995.2 | 1110.0 | 996.6 | 18 | 32 | 19 |
| 18 | Ceduna | 1130.4 | 1094.0 | 1125.3 | 32 | 30 | 32 |
| 19 | Port Augusta | 1102.0 | 1091.3 | 1106.8 | 28 | 29 | 29 |
| 20 | Perth | 982.5 | 1101.1 | 994.5 | 17 | 31 | 18 |
| 21 | Broome | 1076.9 | 1018.8 | 1075.6 | 26 | 19 | 27 |
| 22 | Kununurra | 1091.6 | 901.7 | 1058.8 | 27 | 8 | 26 |
| 23 | Warburton | 1019.7 | 889.7 | 1025.5 | 22 | 5 | 21 |
| 24 | Narrogin | 1034.9 | 1046.6 | 1018.4 | 24 | 24 | 20 |
| 25 | South Hedland | 1124.4 | 1031.3 | 1145.4 | 31 | 23 | 34 |
| 26 | Derby | 1143.0 | 939.1 | 1124.4 | 34 | 11 | 31 |
| 27 | Kalgoorlie | 1166.9 | 1162.3 | 1155.6 | 36 | 35 | 35 |
| 28 | Geraldton | 1143.6 | 987.6 | 1132.2 | 35 | 15 | 33 |
| 29 | Hobart | 804.4 | 1001.6 | 792.1 | 1 | 17 | 1 |
| 30 | Alice Springs | 1058.6 | 872.3 | 1054.9 | 25 | 3 | 25 |
| 31 | Jabiru | 892.0 | 921.8 | 891.7 | 6 | 10 | 6 |
| 32 | Katherine | 976.5 | 894.3 | 983.5 | 15 | 7 | 16 |
| 33 | Aputula | 933.4 | 805.9 | 928.1 | 12 | 2 | 10 |
| 34 | Nhulunbuy | 917.0 | 890.5 | 926.3 | 10 | 6 | 9 |
| 35 | Tennant Creek | 1013.4 | 751.7 | 1051.0 | 21 | 1 | 24 |
| 36 | Darwin | 910.9 | 1011.0 | 933.1 | 8 | 18 | 12 |

**Figure A6-2** COMBINED HOSPITAL AND NON-HOSPITAL DATA-BASED
HEALTH INDEX VS. INDIGENOUS DISADVANTAGE INDEX
(CENSUS-BASED)
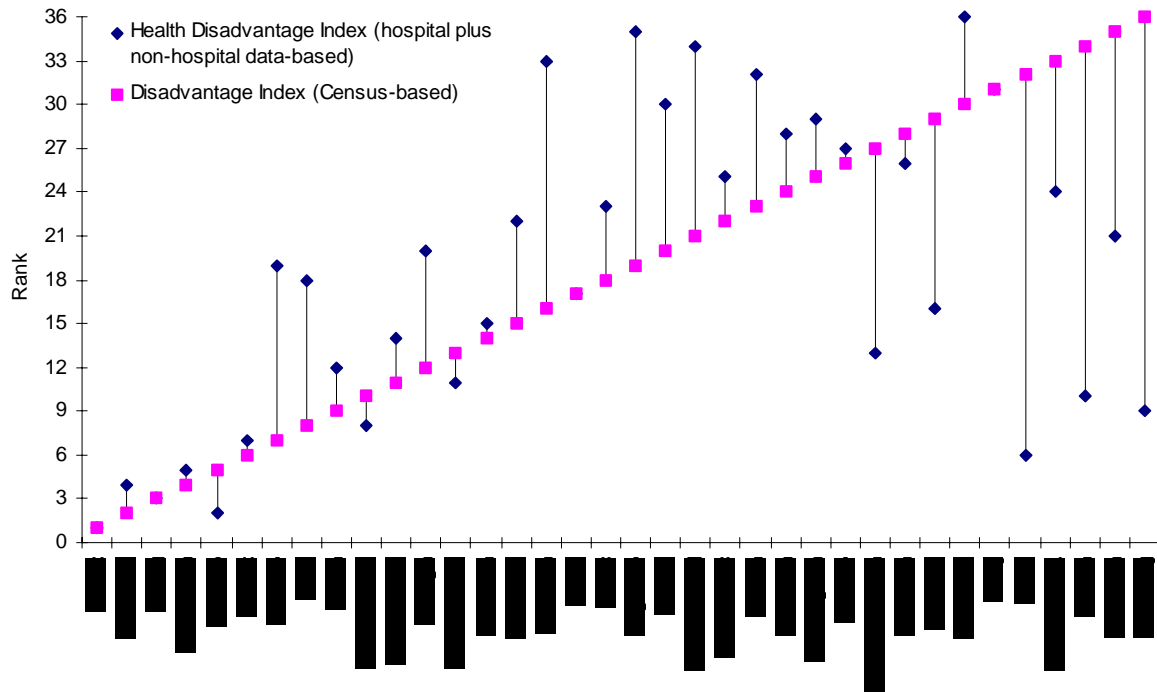


281. ***Implications of data quality (in the form of missing Indigenous status) for
the health index.*** Recall the age-standardised morbidity rates formula discussed in Section
A6.6:

$$m_{diagnosis, \ ATSIC,sex} = \Sigma \ \{m_{ATSIC} \ SP_{age}/SPtotal\} \ x \ 1,000.$$

282. The following errors can lead to misleading results:

(i) If Indigenous separation is falsely identified as non-Indigenous.

(ii) If non-Indigenous separation is falsely identified as Indigenous.

(iii) If there is a big proportion of separations identifed as UNKNOWN.

(iv) If UNKNOWN is comprised mainly of Indigenous separations.

283. Moreover, the following can affect the numerators and denominators, which
may give false results:

(i) If the proportion of UNKNOWN in separations data varies significantly by age group.

(ii) If proportion of UNKNOWN in separations data varies significantly by sex.

(iii) If proportion of UNKNOWN in separations data varies significantly by region.

(iv) If proportion of UNKNOWN in separations data varies significantly by diagnosis (or whatever indicator of disadvantage).

(v) If proportion of UNKNOWN in separations data varies significantly by combinations of A, B, C, D.

(vi) If there is a big proportion of UNKNOWN in Census population data.

(vii) If F is comprised mainly of Indigenous.

(viii) If F is not of the same proportion as 3, by region, age group, or sex.

(ix) If 1 is not of the same proportion as the similar type of error in Census.

(x) If mis/un-identication errors in weights (the standard population) varies across the standard population's age groups.

284. Using the separations data for Queensland, in which information on non-Indigenous separations is available, it is possible to compute the extent to which the problem of indigenous identification varies in the data set, by ATSIC Region, sex, age group, and principal diagnosis. The results are shown in Tables A6-6, A6-7, A6-8 and A6-9.

285. Table A6-6 shows that in a number of ATSIC regions, the Indigenous separations as a share of total separations in the region are higher than the proportion of Indigenous population in the region. The table also shows that the proportion of the population in Queensland that did not state whether they were indigenous or not varied (by ATSIC region) between 3 percent and 6 percent. However the proportion of separations where indigenous identity is not stated varies (by ATSIC region) from about 4 percent to 17 percent. Thus the nature of the identification problem is different between the 1996 and the hospital separation data sets.

286. Table A6-7 seems to suggest that there are no significant differences between male and female propensity for Indigenous identification in the hospital data set.

287. Table A6-8 suggests that the propensity to identify as Indigenous or otherwise in the hospital data set varies by age.

288. Finally Table A6-9 suggests that (at least in Queensland) the propensity to identify as Indigenous or otherwise in the hospital data set varies by principal diagnosis.

289.    ***PCA on hospital data.***  Tables A6-10, A6-11, A6-12, and A6-13 show the output of the principal components analysis for different subsets of the hospital data. Tables A6-10 and A6-11 refer to the analysis of hospital separations data only.  Tables A6-12 and A6-13 refer to the analysis of hospital separations and non-hospital data.

290.    Table A6-11 shows that of the initial 17 variables, 13 were eventually considered for the index. DIALYSIS, NUTRITN, BEDDAYS, and SEPMODE6 were dropped because their contribution to the thrust of the index was not significant enough (i.e. they had either low correlations with the computed index or wrong signs).

291.    The exclusion of DIALYSIS removes one of the major difficulties associated with hospital data separations which are accounted for repetitively by chronic patients. Hospital separations for dialysis, which is performed almost exclusively on a same day basis, accounts for a large proportion of Indigenous separations (25 percent).

292.    NUTRITN does not correlate well too with the index. It represents separations for nutritional deficiencies.  It is tempting to suggest that unless nutritional deficiency develops into a more serious disease, nutritionally deficient persons would not normally go to the hospital for treatment.

293.    The variable BEDDAYS also turned out to be relatively insignificant.  Are patients who stay longer in hospitals more disadvantaged?  The affirmative is the premise for this variable.  However, it is possible that patients do not get to stay long because there are no hospital beds available, or that the services required are not available, or that they were discharged to some other hospital  (and in that event would get a different hospital record identifier), or that they died immediately.  These cases would also point to some form of disadvantage.

294.    The first principal component was used to create the disadvantage index. The first component has a very high eigenvalue (greater than 9) and accounts for two-thirds of the total variance.  Rules-of-thumb indicate that its use is acceptable.

295.    ***Relationship between the hospital separation data variables and NATSIS variables.***    Table A6-14 shows the correlation coefficients between the disadvantage indicators derived from the hospital separations data, with those extracted from the 1994 NATSIS.  Most of the morbidity rates from the hospital data show a positive correlation with the self-perceived indicators ALCO and VIOLENCE of the NATSIS. ALCO and VIOLENCE refer to the proportion of persons aged 13 years and over who perceived alcohol and family violence, respectively, as major local area problems.

## A6.8  Conclusions

296.    Hospital separations data can be a potentially valuable source of information about the health status and health service utilisation of the Indigenous people.  However, there are certain technical and conceptual issues which make the data's application to a disadvantage index construction difficult.  Foremost among the technical issues is the problem of inaccuracy in identifying Indigenous separations.  Several small-scale studies have shown that there is room for improving Indigenous identification in hospital

administrative collections. Until a nationwide study concludes otherwise, the use of hospital data for Indigenous analysis should always be taken with caution as the data may be undercounting the number of Indigenous patients and/or separations.

297. The conceptual issues may be harder to resolve. Is high hospitalisation rate a disadvantage or advantage? As mentioned previously, hospital separation statistics are not a measure of the prevalence of disease. They refer to episodes of hospitalisation rather than people. A single individual may account for so many separation records. While this problem may possibly be addressed by assigning weights to separations which are chronic or periodic in nature (e.g. dialysis), finding such a weight by sex, age, and area will be difficult. For example, the frequency of dialysis visits may vary by age and may also be affected by the demand and supply (for/of dialysis machines) conditions in the area.

298. Generally, each hospital admission represents a mixture of need, access, and demand. Low rates of hospitalisation may represent lower level of need or they may mean existing needs are not being met. Conversely, a rising rate of hospitalisation could mean either a worsening of health status or an improvement in access.

299. The issues above are complicated by the fact that hospital admission policies vary from hospital to hospital and State to State, as does the availability of *outpatient* care services. A person with a particular condition may be admitted to hospital in one area but treated as a day patient or outpatient or at a doctor's surgery in another area. These variations in policies will mean that a direct comparison of the number of Indigenous separations by geographic regions will be problematic.

300. This appendix has demonstrated that it is possible to construct a health disadvantage index based on inter-region differences in hospital separation rates. It is possible to identify certain diseases which reflect socioeconomic disadvantage and to use these age-standardised morbidity rates to construct an index. Principal components analysis remain applicable for the purpose. However, the index should be taken with utmost caution. Its interpretation, in terms of the implied ranking of regions, may be flawed for the many reasons cited above.

**Table A6-6**   PROPORTION OF INDIGENOUS STATUS 'NOT STATED/UNKNOWN', 1997-98 HOSPITAL DATA AND 1996 CENSUS OF POPULATION, BY ATSIC REGION (IN QUEENSLAND)

**Indigenous identification of separations based on the 1997-98 hospital data**

| | Number of separations | | | | Per cent distribution | | | |
|---|---|---|---|---|---|---|---|---|
| | Indigenous | Non Indigenous | Not stated | *Total* | Indigenous (%) | Non Indigenous (%) | Not stated (%) | *Total (%)* |
| Brisbane | 6700 | 534361 | 112414 | *653475* | 1.0 | 81.8 | 17.2 | *100.0* |
| Cairns | 8189 | 42968 | 8142 | *59299* | 13.8 | 72.5 | 13.7 | *100.0* |
| Mount Isa | 3855 | 7094 | 429 | *11378* | 33.9 | 62.3 | 3.8 | *100.0* |
| Cooktown | 4180 | 1879 | 218 | *6277* | 66.6 | 29.9 | 3.5 | *100.0* |
| Rockhampton | 3721 | 104722 | 8998 | *117441* | 3.2 | 89.2 | 7.7 | *100.0* |
| Roma | 3513 | 86750 | 6087 | *96350* | 3.6 | 90.0 | 6.3 | *100.0* |
| Torres Strait Area | 1969 | 408 | 99 | *2476* | 79.5 | 16.5 | 4.0 | *100.0* |
| Townsville | 6940 | 74857 | 14648 | *96445* | 7.2 | 77.6 | 15.2 | *100.0* |

**Indigenous identification: 1996 Census of Population**

| | Number of Persons | | | | Per cent distribution | | | |
|---|---|---|---|---|---|---|---|---|
| | Indigenous | Non Indigenous | Not stated | *Total* | Indigenous (%) | Non Indigenous (%) | Not stated (%) | *Total (%)* |
| Brisbane | 27635 | 2016874 | 62904 | *2107413* | 1.3 | 95.7 | 3.0 | *100.0* |
| Cairns | 14712 | 168380 | 8728 | *191820* | 7.7 | 87.8 | 4.6 | *100.0* |
| Mount Isa | 6658 | 26113 | 1465 | *34236* | 19.4 | 76.3 | 4.3 | *100.0* |
| Cooktow n | 5635 | 7076 | 773 | *13484* | 41.8 | 52.5 | 5.7 | *100.0* |
| Rockhampton | 11332 | 351508 | 11340 | *374180* | 3.0 | 93.9 | 3.0 | *100.0* |
| Roma | 8804 | 262198 | 8437 | *279439* | 3.2 | 93.8 | 3.0 | *100.0* |
| Torres Strait Area | 6064 | 1297 | 254 | *7615* | 79.6 | 17.0 | 3.3 | *100.0* |
| Tow nsville | 14678 | 286025 | 10296 | *310999* | 4.7 | 92.0 | 3.3 | *100.0* |

**Table A6-7**   PROPORTION OF INDIGENOUS STATUS 'NOT STATED/UNKNOWN', 1997-98 QUEENSLAND HOSPITAL DATA, BY SEX

| | Indigenous (%) | Not Indigenous (%) | Not stated/ Unknow n (%) | *Total (%)* |
|---|---|---|---|---|
| Male | 3.4 | 82.5 | 14.1 | *100.0* |
| Female | 3.9 | 81.1 | 14.9 | *100.0* |

**Table A6-8**   PROPORTION OF INDIGENOUS STATUS 'NOT STATED/UNKNOWN', 1997-98 QUEENSLAND HOSPITAL DATA, BY AGE GROUP

| | Per cent distribution | | | |
| --- | --- | --- | --- | --- |
| | Indigenous (%) | Non Indigenous (%) | Not stated (%) | *Total (%)* |
| Less than 1 | 9.19 | 83.35 | 7.5 | *100.0* |
| 1-4 | 7.47 | 83.95 | 8.6 | *100.0* |
| 5-9 | 6.09 | 83.70 | 10.2 | *100.0* |
| 10-14 | 4.72 | 84.64 | 10.6 | *100.0* |
| 15-19 | 6.03 | 81.62 | 12.4 | *100.0* |
| 20-24 | 6.15 | 82.49 | 11.4 | *100.0* |
| 25-29 | 5.14 | 82.04 | 12.8 | *100.0* |
| 30-34 | 5.20 | 80.12 | 14.7 | *100.0* |
| 35-39 | 4.53 | 79.15 | 16.3 | *100.0* |
| 40-44 | 5.44 | 78.59 | 16.0 | *100.0* |
| 45-49 | 3.67 | 79.87 | 16.5 | *100.0* |
| 50-54 | 3.70 | 79.88 | 16.4 | *100.0* |
| 55-59 | 3.22 | 81.17 | 15.6 | *100.0* |
| 60-64 | 2.58 | 81.38 | 16.0 | *100.0* |
| 65-69 | 1.62 | 83.37 | 15.0 | *100.0* |
| 70-74 | 0.79 | 82.55 | 16.7 | *100.0* |
| 75+ | 0.73 | 83.89 | 15.4 | *100.0* |

**Table A6-9**   PROPORTION OF INDIGENOUS STATUS 'NOT STATED/UNKNOWN', 1997-98 QUEENSLAND HOSPITAL DATA, BY PRINCIPAL DIAGNOSIS  (ICD-9 MAIN CHAPTER)

| Principal diagnosis | Indigenous (%) | Non- Indigenous (%) | Not Stated/ Unknown (%) | *Total (%)* |
| --- | --- | --- | --- | --- |
| Infectious/parasitic diseases | 8.2 | 82.4 | 9.5 | *100.0* |
| Neoplasms | 1.0 | 84.7 | 14.3 | *100.0* |
| Endocrine/nutritional/metabolic disorders | 7.8 | 80.0 | 12.2 | *100.0* |
| Diseases of the blood and bloodforming organs | 1.8 | 85.1 | 13.1 | *100.0* |
| Mental disorders | 3.7 | 72.5 | 23.8 | *100.0* |
| Nervous system diseases | 2.5 | 81.4 | 16.1 | *100.0* |
| Circulatory diseases | 2.3 | 85.5 | 12.2 | *100.0* |
| Respiratory diseases | 6.6 | 82.0 | 11.5 | *100.0* |
| Digestive diseases | 2.0 | 82.7 | 15.3 | *100.0* |
| Genitourinary diseases | 2.7 | 77.6 | 19.7 | *100.0* |
| Complications of pregnancy and childbirth | 5.2 | 84.9 | 9.9 | *100.0* |
| Diseases of skin and subcutaneous tissue | 8.2 | 80.2 | 11.6 | *100.0* |
| Musculoskeletal diseases | 1.7 | 78.5 | 19.8 | *100.0* |
| Congenital anomalies | 3.4 | 86.4 | 10.1 | *100.0* |
| Certain perinatal conditions | 6.6 | 84.9 | 8.5 | *100.0* |
| Ill-defined conditions | 3.1 | 85.3 | 11.6 | *100.0* |
| Injury | 5.5 | 84.6 | 9.9 | *100.0* |
| Other reasons for contact (incl dialysis) | 5.1 | 78.0 | 16.9 | *100.0* |

**Table A6-10** PRINCIPAL COMPONENTS ANALYSIS OUTPUT FROM ANALYSIS
OF HOSPITAL DATA ONLY — WHEN VARIABLE EXCLUSION
RULES ARE NOT IMPOSED

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 8.7819 | 6.0339 | 0.5166 | 0.5166 |
| PCR2 | 2.7480 | 0.6891 | 0.1616 | 0.6782 |
| PCR3 | 2.0589 | . | 0.1211 | 0.7993 |

| Eigenvectors (CORR) | | | |
|---|---|---|---|
| Variable | PCR1 | PCR2 | PCR3 |
| BEDDAYS | 0.0212 | 0.5232 | -0.2174 |
| DIABETES | 0.2852 | 0.0804 | -0.0595 |
| DIALYSIS | 0.0627 | -0.2186 | 0.5417 |
| DIGESTIV | 0.2914 | -0.1053 | -0.1954 |
| FEMSEPS | 0.2858 | -0.0007 | 0.2915 |
| HOMICIDE | 0.3020 | 0.1200 | 0.1039 |
| INJURY | 0.3244 | 0.0432 | 0.0336 |
| ISCHAEM | 0.2002 | -0.1984 | -0.2680 |
| MALESEPS | 0.2978 | -0.0041 | 0.2466 |
| MENTAL | 0.2047 | -0.2688 | -0.3346 |
| NUTRITN | 0.0481 | 0.3039 | 0.3296 |
| PARASITE | 0.2892 | 0.2269 | 0.1059 |
| POISON | 0.2421 | -0.2347 | -0.3036 |
| PREGNANT | 0.2919 | 0.1291 | -0.1182 |
| RESPIRAT | 0.3179 | 0.1316 | 0.0118 |
| SEPMODE6 | -0.0032 | 0.5094 | -0.1939 |
| SUICIDE | 0.2230 | -0.2017 | 0.1111 |

| Pattern Matrix (CORR) | | | |
|---|---|---|---|
| Variable | PCR1 | PCR2 | PCR3 |
| BEDDAYS | 0.0630 | 0.8673 | -0.3120 |
| DIABETES | 0.8453 | 0.1334 | -0.0854 |
| DIALYSIS | 0.1859 | -0.3624 | 0.7773 |
| DIGESTIV | 0.8635 | -0.1746 | -0.2803 |
| FEMSEPS | 0.8469 | -0.0012 | 0.4182 |
| HOMICIDE | 0.8950 | 0.1989 | 0.1491 |
| INJURY | 0.9614 | 0.0715 | 0.0482 |
| ISCHAEM | 0.5934 | -0.3289 | -0.3846 |
| MALESEPS | 0.8826 | -0.0069 | 0.3539 |
| MENTAL | 0.6065 | -0.4456 | -0.4801 |
| NUTRITN | 0.1425 | 0.5037 | 0.4730 |
| PARASITE | 0.8570 | 0.3761 | 0.1520 |
| POISON | 0.7174 | -0.3890 | -0.4356 |
| PREGNANT | 0.8650 | 0.2139 | -0.1696 |
| RESPIRAT | 0.9420 | 0.2181 | 0.0170 |
| SEPMODE6 | -0.0096 | 0.8444 | -0.2782 |
| SUICIDE | 0.6608 | -0.3344 | 0.1594 |

**Table A6-11**  PRINCIPAL COMPONENTS ANALYSIS OUTPUT FROM ANALYSIS
OF HOSPITAL DATA ONLY — WHEN VARIABLE EXCLUSION
RULES ARE IMPOSED

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1_1 | 8.7301 | 6.9949 | 0.6715 | 0.6715 |
| PCR2_1 | 1.7352 | 0.9892 | 0.1335 | 0.8050 |
| PCR3_1 | 0.7460 | . | 0.0574 | 0.8624 |

| Eigenvectors (CORR) | | | |
|---|---|---|---|
| Variable | PCR1_1 | PCR2_1 | PCR3_1 |
| DIABETES | 0.2874 | -0.1055 | -0.3026 |
| DIGESTIV | 0.2947 | 0.2344 | -0.1982 |
| FEMSEPS | 0.2827 | -0.2147 | 0.0576 |
| HOMICIDE | 0.3020 | -0.2329 | 0.1366 |
| INJURY | 0.3253 | -0.1083 | 0.0762 |
| ISCHAEM | 0.2026 | 0.4770 | -0.1590 |
| MALESEPS | 0.2957 | -0.2014 | 0.0254 |
| MENTAL | 0.2097 | 0.5037 | -0.0484 |
| SUICIDE | 0.2234 | 0.0669 | 0.8196 |
| PARASITE | 0.2880 | -0.2863 | -0.0018 |
| POISON | 0.2469 | 0.4412 | 0.1875 |
| PREGNANT | 0.2938 | -0.0562 | -0.2939 |
| RESPIRAT | 0.3179 | -0.1261 | -0.1405 |

| Pattern Matrix (CORR) | | | |
|---|---|---|---|
| Variable | PCR1_1 | PCR2_1 | PCR3_1 |
| DIABETES | 0.8491 | -0.1389 | -0.2613 |
| DIGESTIV | 0.8707 | 0.3088 | -0.1712 |
| FEMSEPS | 0.8354 | -0.2828 | 0.0498 |
| HOMICIDE | 0.8922 | -0.3068 | 0.1180 |
| INJURY | 0.9611 | -0.1427 | 0.0658 |
| ISCHAEM | 0.5987 | 0.6283 | -0.1373 |
| MALESEPS | 0.8738 | -0.2653 | 0.0219 |
| MENTAL | 0.6195 | 0.6635 | -0.0418 |
| SUICIDE | 0.6601 | 0.0881 | 0.7079 |
| PARASITE | 0.8509 | -0.3771 | -0.0016 |
| POISON | 0.7296 | 0.5811 | 0.1620 |
| PREGNANT | 0.8680 | -0.0741 | -0.2538 |
| RESPIRAT | 0.9392 | -0.1661 | -0.1214 |

**Table A6-12** PRINCIPAL COMPONENTS ANALYSIS OUTPUT FROM ANALYSIS
OF HOSPITAL PLUS NON-HOSPITAL DATA WHEN VARIABLE
EXCLUSION RULES ARE NOT IMPOSED

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR1 | 11.2255 | . | 0.3118 | 0.3118 |

| Eigenvectors (CORR) | | Pattern Matrix (CORR) | |
|---|---|---|---|
| Variable | PCR1 | Variable | PCR1 |
| FETAL | 0.1596 | FETAL | 0.5347 |
| NEONATAL | 0.0576 | NEONATAL | 0.1930 |
| PERINAT | 0.1385 | PERINAT | 0.4642 |
| ARREST | 0.0463 | ARREST | 0.1550 |
| VIOLENCE | 0.2400 | VIOLENCE | 0.8042 |
| ATTACK | -0.0550 | ATTACK | -0.1842 |
| ILL | -0.1611 | ILL | -0.5398 |
| SMOKE | -0.0121 | SMOKE | -0.0405 |
| SMOKE_M | 0.0877 | SMOKE_M | 0.2938 |
| SMOKE_F | -0.0983 | SMOKE_F | -0.3295 |
| ALCO | 0.2283 | ALCO | 0.7648 |
| OBESE_P | 0.0639 | OBESE_P | 0.2142 |
| OBESE_M | -0.0394 | OBESE_M | -0.1320 |
| OBESE_F | 0.1056 | OBESE_F | 0.3539 |
| DISTAH | -0.0059 | DISTAH | -0.0199 |
| HSERVICE | 0.0321 | HSERVICE | 0.1077 |
| HPOOR | -0.0462 | HPOOR | -0.1546 |
| HDRUG | 0.0638 | HDRUG | 0.2138 |
| LOWBWGT | 0.1323 | LOWBWGT | 0.4432 |
| BEDDAYS | 0.0299 | BEDDAYS | 0.1002 |
| DIABETES | 0.2590 | DIABETES | 0.8678 |
| DIALYSIS | 0.0618 | DIALYSIS | 0.2072 |
| DIGESTIV | 0.2404 | DIGESTIV | 0.8055 |
| FEMSEPS | 0.2573 | FEMSEPS | 0.8621 |
| HOMICIDE | 0.2733 | HOMICIDE | 0.9156 |
| INJURY | 0.2863 | INJURY | 0.9593 |
| ISCHAEM | 0.1527 | ISCHAEM | 0.5115 |
| MALESEPS | 0.2665 | MALESEPS | 0.8928 |
| MENTAL | 0.1479 | MENTAL | 0.4957 |
| NUTRITN | 0.0764 | NUTRITN | 0.2559 |
| PARASITE | 0.2647 | PARASITE | 0.8868 |
| POISON | 0.1785 | POISON | 0.5979 |
| PREGNANT | 0.2533 | PREGNANT | 0.8488 |
| RESPIRAT | 0.2787 | RESPIRAT | 0.9338 |
| SEPMODE6 | 0.0097 | SEPMODE6 | 0.0325 |
| SUICIDE | 0.1837 | SUICIDE | 0.6154 |

**Table A6-13** PRINCIPAL COMPONENTS ANALYSIS OUTPUT FROM ANALYSIS OF HOSPITAL PLUS NON- HOSPITAL DATA WHEN VARIABLE EXCLUSION RULES ARE IMPOSED

| Eigenvalues (CORR) | | | | |
|---|---|---|---|---|
| Component | Eigenvalue | Difference | Proportion | Cumulative |
| PCR11 | 10.3659 | . | 0.5759 | 0.5759 |

| Eigenvectors (CORR) | | Pattern Matrix (CORR) | |
|---|---|---|---|
| Variable | PCR11 | Variable | PCR11 |
| FETAL | 0.1484 | FETAL | 0.4777 |
| PERINAT | 0.1218 | PERINAT | 0.3922 |
| VIOLENCE | 0.2513 | VIOLENCE | 0.8091 |
| ALCO | 0.2394 | ALCO | 0.7709 |
| LOWBWGT | 0.1263 | LOWBWGT | 0.4067 |
| DIABETES | 0.2680 | DIABETES | 0.8628 |
| DIGESTIV | 0.2611 | DIGESTIV | 0.8407 |
| HOMICIDE | 0.2823 | HOMICIDE | 0.9088 |
| FEMSEPS | 0.2634 | FEMSEPS | 0.8482 |
| INJURY | 0.2989 | INJURY | 0.9625 |
| ISCHAEM | 0.1732 | ISCHAEM | 0.5577 |
| MALESEPS | 0.2747 | MALESEPS | 0.8845 |
| MENTAL | 0.1752 | MENTAL | 0.5640 |
| PARASITE | 0.2691 | PARASITE | 0.8663 |
| POISON | 0.2074 | POISON | 0.6679 |
| PREGNANT | 0.2681 | PREGNANT | 0.8631 |
| RESPIRAT | 0.2897 | RESPIRAT | 0.9327 |
| SUICIDE | 0.2022 | SUICIDE | 0.6510 |

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**Table A6-14** CORRELATION BETWEEN HOSPITAL DATA-BASED INDICATORS AND NATSIS DISADVANTAGE INDICATORS

| Hospital Data Variable | Description | Hospital Data variable is +ly correlated (Spearman rank > 0.50) with the following NATSIS variables |
|---|---|---|
| PERSEP | Age-standardised morbidity rates, Indigenous persons, all diagnosis codes | ALCO, |
| MALESEP | Age-standardised morbidity rates, Indigenous males, all diagnosis codes | ALCO, |
| FEMSEP | Age-standardised morbidity rates, Indigenous females, all diagnosis codes | ALCO, |
| MENTAL | Age-standardised morbidity rates, Indigenous persons, Mental disorders, including alcohol and drug-related psychosis, dependence, abuse) | HPOOR, ALCO, |
| DIABETE | Age-standardised morbidity rates, Indigenous persons, Diabetes (ICD-9 Code | |
| ISCHAE | Age-standardised morbidity rates, Indigenous persons, Ischaemic heart disease (including acute myocardial infarction) (ICD-9 Code 410-414) | ALCO, SMOKE, |
| NUTRIT | Age-standardised morbidity rates, Indigenous persons, nutritional deficiencies (ICD-9 Code 260- | UNSEALR, AVEPBR, HSERVICE, PERINAT, HLIV, NOSCH16, LTUNEMP, NEONATAL, HBED, LOWINC, |
| DIALYSIS | Age-standardised morbidity rates, Indigenous persons, dialysis (ICD-9 Code V56) | |
| PARASITE | Age-standardised morbidity rates, Indigenous persons, Infectious/parasitic diseases (ICD-9 Codes 001-139) | NATRENT, PARTEMP, VIOLENCE, ALCO, |
| PREGNAN | Age-standardised morbidity rates, Indigenous persons, Complications of pregnancy and childbirth (ICD-9 Codes 630-677) | VIOLENCE, |
| RESPIRA | Age-standardised morbidity rates, Indigenous persons, Respiratory diseases (ICD-9 Codes 460-519) | ALCO, VIOLENCE, |
| DIGESTI | Age-standardised morbidity rates, Indigenous persons, Digestive diseases (ICD-9 Codes 520-579) | ALCO, VIOLENCE, |
| INJURY | Age-standardised morbidity rates, Indigenous persons, Injury (ICD-9 Codes 800-999 and E800- | VIOLENCE, ALCO, PARTEMP, NATRENT, |
| SUICID | Age-standardised morbidity rates, Indigenous persons, where principal external cause of injury = Self-inflicted injury, suicide (ICD-9 Codes E950- | VIOLENCE, ALCO, |
| HOMICID | Age-standardised morbidity rates, Indigenous persons, where principal external cause of injury = Injury purposely inflicted by others, homicide (ICD-9 Codes E960- | VIOLENCE, PARTEMP, ALCO, NATRENT, HDRUG, |
| POISON | Age-standardised morbidity rates, Indigenous persons, Poisoning, toxic effects (ICD-9 Codes E960-E989) (Includes toxic effect of petroleum products) | VIOLENCE, ALCO, HPOOR, |
| SEPMODE | Mode of separation = Left against medical advice/discharge at own risk as a proportion of total separations (%) | FETAL, |
| BEDDAYS | Average of length of stay (i.e. the number of days the patient was admitted for) by ATSIC region | HSERVIC |

# GLOSSARY

***Dependent child***   A dependent child is an individual who is either a child aged less than 15 years or a dependent student.  To be regarded as a child the individual can have no partner or child of his/her own usually resident in the same household.  A dependent child must be attached to a nominal parent with whom he/she usually resides.  This parent must be over 15 years of age.

***Dwelling***   A dwelling is a building or structure in which people live.  This can be a building, such as a house; part of a building, such as a flat; or it can be a caravan or tent, humpy or park bench.  Houses under construction, derelict houses, vacant tents, or converted garages are not counted in the Census.

There are private and non-private dwellings.  A private dwelling is normally a house, flat, part of a house, or even a room; but can also be a house attached to, or rooms above, shops or offices; an occupied caravan or unit in a caravan park or craft in a marina; an occupied dwelling in a manufactured home estate; an occupied self-care unit in accommodation for the retired or aged; a houseboat; or tent if it is standing on its own block of land.  An occupied caravan situated on a residential allotment is also classed as a private dwelling.  Private dwellings can be either occupied or unoccupied.  Non-private dwellings are those dwellings not included above, which provide a communal or transitory type of accommodation.  These dwellings include hotels, motels, guest houses, prisons, religious and chariAppendix Table institutions, defence establishments, hospitals and other communal dwellings.  Only occupied non-private dwellings are included in the Census.

***Family***   A family is defined by the Australian Bureau of Statistics as two or more persons, one of whom is at least 15 years of age, who are related by blood, marriage (registered or de facto), adoption, step or fostering, and who are usually resident in the same household.  Non-related persons living in the same household are not counted as family members (unless under 15 years of age).

***Family income***   Family income is the sum of the personal incomes of each resident family member aged 15 years or more.  Family income is not applicable to non-family households such as group households or lone-person households; or to people in non-private dwellings.

***Household***   A household is defined as a group of two or more related or unrelated people who usually reside in the same dwelling, who regard themselves as a household, and who make common provision for food or other essentials for living; or a person living in a dwelling who makes provision for his/her own food and other essentials for living, without combining with any other person.

***Households are classified to three main types:***

***Family household***:   A household consisting of two or more persons, one of whom is at least 15 years of age, who are related by blood, marriage (registered or de facto), adoption,

step or fostering, and who are usually resident in the same household. A household can contain one or more families. Thus the number of families living in occupied private dwellings may be more than the number of family households.

*Lone-person household*:   A person who makes provision for his/her own food and other essentials in living, without combining with any other person to form part of a multi-person household. He/she may live in a dwelling on his/her own or share a dwelling with another individual or family.

*Group household*:   A household consisting of two or more unrelated people where all persons are aged 15 years or over. There are no reported couple relationships, parent-child relationships or other blood relationships in these households.

*Household income*   Household income is the sum of the personal incomes of each resident aged 15 years or more present in the household. Persons who were temporarily absent on census night, or had nil or negative income, or did not state their income, do not contribute to household income. Although visitors' incomes are excluded in the calculation of household income, household income is still calculated for households that comprise only visitors, in order to collect data on household incomes in holiday resorts.

*Improvised dwellings*   Includes shelter, sheds, tents occupied on a permanent or semi-permanent basis and not located in caravan parks.

*Income*   People aged 15 years or more were asked to state their usual gross weekly income, which is the income before tax, superannuation, health insurance, or other deductions are made.   Gross income includes family allowance, family allowance supplement, pensions, unemployment benefits, student allowances, maintenance (child support), superannuation, wages, overtime, dividends, rents received, interest received, business or farm income (less operation expenses) and workers' compensation received.

*Indigenous family*   An Indigenous family is one where either the reference person or spouse is of Aboriginal and/or Torres Strait Islander origin.

*Indigenous household*   An Indigenous household is a family household where any family in the household is defined as an Indigenous family or a lone-person household where the lone person is of Aboriginal and/or Torres Strait Islander origin.

*Labour force*   The labour force is made up of employed and unemployed people aged 15 years and over.

*Labour force status*   Labour force status identifies whether a person aged 15 years or over is employed, unemployed or not in the labour force.

*Employed*:   includes those people who, during the week prior to census night, worked for payment or profit; who had a job from which they were on leave or otherwise temporarily absent; were on strike or stood down temporarily; or worked as unpaid helpers in a family business.

***Unemployed*:**   includes people who, during the week prior to census night, did not have a job but were actively looking for work (either full-time or part-time) and were available to start work.

***Not in the labour force***:   includes people aged 15 years or more who were not employed or unemployed as defined above.  This category includes people who were retired, pensioners and people engaged in home duties.

***Occupation***   This variable describes the main job held by employed people (aged 15 years and over) during the week prior to census night, and is coded using the ASCO-Australian Standard Classification of Occupations, Second Edition, 1997 (Cat. no. 1220.0).

***One-parent family***   A one-parent family consists of a lone parent with at least one child (regardless of age) who is usually resident in the household.  The family may also include any number of other related individuals.

***Participation rate***   Number of persons in the labour force expressed as a percentage of the population aged 15 years and over.  The participation rate is calculated excluding persons who did not state their labour force status.

***Post-school qualifications***   In all censuses since 1966, people aged 15 years and over have been asked to describe their post-school qualifications.  In 1996, these responses were coded according to the ABS Classification of Qualifications (ABSCQ), 1993 (Cat. no. 1262.0).

***Reference person***   The reference person is the person who is used as the basis for determining the family and non-family relationships within a household.  It is usually the person who has identified himself/herself as person one on the Household Form.

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