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Centre for Aboriginal Economic Policy Research

## Discussion Paper

# Socioeconomic status at the ATSIC regional level, 1986 and 1991: data for regional planning?

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No.76/1994

ISSN 1036-1774
ISBN 0 7315 1750 4

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- assist in the development of government strategies aimed at raising the level of Aboriginal and Torres Strait Islander participation in the labour market.

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## ABSTRACT

A major feature of the Aboriginal and Torres Strait Islander Commission (ATSIC) has been its regional structure, currently consisting of 36 jurisdictions. The data and analysis in this discussion paper were produced primarily for ATSIC regional councils for both regional planning and bottom-up resource-bidding purposes. This paper examines 1986 and 1991 Census data disaggregated to these 36 regional council levels, focuses on the three socioeconomic variables of employment, education and income, and combines these variables to generate an Index of Socioeconomic Advantage (ISA). Variations in this index between regions in 1986 and 1991 are examined and some analysis is undertaken of changes during that five-year period. Finally, some potential policy issues are considered, including both the negative and positive aspects of relying on census data for such planning purposes. Significant areas for further research are outlined, indicating not only the necessary changes and additions needed to augment the current database, but also some of the possible needs of regional councils when preparing a regional development plan.

## Acknowledgments

Earlier versions of this paper using different data sets and more complex methodologies to calculate an index of socioeconomic advantage were presented at seminars at the Australian National University in August 1994 and at ATSIC in October 1994. Making two verbal and visual presentations convinced us that it is imperative to follow the dictum 'simplify complexity' in this particular statistical exercise. We would like to thank those who participated in both seminars and whose feedback has greatly influenced the final version of this discussion paper. Geoff Dane and David Singh, Statistics Section, ATSIC, facilitated our research greatly by providing ready access to statistics. Additional substantive comments from Mike Dillon, John Taylor and Will Sanders are gratefully acknowledged. Hilary Bek assisted with editing and Belinda Lim with table layout. Thanks also to Linda Roach, Krystyna Szokalski and Nicky Lumb for subeditorial and proofreading assistance. It would be remiss of us not to acknowledge the earlier work in this area by Centre for Aboriginal Economic Policy Research (CAEPR) Associate Habtemariam Tesfaghiorghis whose relatively straightforward three-variable index we eventually used, after experimenting with many alternatives.

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Regionalism is an important issue in Aboriginal and Torres Strait Islander affairs because a major feature of the Aboriginal and Torres Strait Islander Commission (ATSIC) since its inception has been its regional structure. This structure developed partly because of: the documented contemporary diversity of the circumstances of indigenous Australians that is linked to the history of settlement of the continent by non-indigenous people; interstate variations in policy and practice; variable impacts of settlement; and, variability in precontact settlement patterns, population distribution and social organisation.

In 1991, Tesfaghiorghis (1991a) published a paper that examined variations in Aboriginal economic status by ATSIC regions. At that time, there were sixty regions and only 1986 Census data were available for analysis at the regional council level. Tesfaghiorghis's analysis was a reconstruction exercise applying 1991 ATSIC regional boundaries to 1986 Census data output, thus recreating jurisdictions that did not exist in 1986. Altman and Gaminiratne (1992) and Khalidi (1992) undertook even more ambitious reconstructions using 1976 and 1986 Censuses.

Today, after legislative amendment in 1993, there are 36 ATSIC regional jurisdictions.[1] This paper examines a reconstruction of 1986 and 1991 Census output, disaggregated to these regions. The paper provides some information on three socioeconomic variables: employment, education and income; these three social indicators are then combined to generate an Index of Socioeconomic Advantage (ISA). We examine variations in these indexes between regions at two points in time, 1986 and 1991, before analysing change over the five-year time period. This analysis focuses on indigenous Australians' economic status only, seeking to assess relative wellbeing at the regional level of disaggregation. No attempt is made to examine relative advantage between indigenous and non-indigenous Australians, which will be the subject of later research. This is largely a descriptive exercise; little attempt is made to correlate socioeconomic change with government program expenditure because accurate historical data on the latter are not available to undertake such an exercise.

## Purpose of this analysis

Data collected by the Australian Bureau of Statistics (ABS) in the five-yearly census remains the only source for the construction of social indicators about indigenous Australians at the national level that can then be disaggregated to the ATSIC regional level.[2] Social indicators can be utilised in the Aboriginal and Torres Strait Islander affairs regional context in three broad ways.

First, information on each regional council can provide important data for planning, one of the key statutory functions of regional councils. For

planning and bottom-up resource-bidding purposes, it would also help each regional council to locate the socioeconomic status of its constituents in relation to other regional councils. ATSIC has suggested that census-based statistics may be important for regional planning purposes (ATSIC 1992). In short, analysis of census data can play a crucial role in 'bottom-up' planning.

Second, such data also has the potential for 'top down' resource allocation decision making. Smith (1993a, 1993b) examined the potential for using a fiscal equalisation model as the basis for allocating discretionary program resources to ATSIC regional councils. More recently, consultants Street Ryan and Associates (1994) were commissioned by ATSIC to develop a methodology for the distribution of funds to ATSIC regional councils on a systematic basis. Although the consultancy report is not yet publicly available, it is interesting to note that Street Ryan used a version of the Commonwealth Grants Commission's fiscal equalisation model at the ATSIC regional level, assessing relative need according to a range of socioeconomic indicators and service provision cost relativities to provide a preliminary basis for allocating funds for a number of program areas. 1986 and 1991 Census data were used in the Street Ryan exercise, as well as ATSIC dollar allocations to regions in 1993-94.[3]

Finally, census data disaggregated to the regional council level could provide a means to assess changes in socioeconomic status over time and the means to assess the impact of program dollar inputs on socioeconomic status outcomes. Unfortunately, this very important role for census data as a performance indicator has not been prominent, even though two recent major reviews of the Aboriginal Employment Development Policy (AEDP) (Bamblett 1994) and the Aboriginal and Torres Strait Islander Education Policy (AEP) (Yunupingu 1994) have had to use intercensal change in employment, income and education status as a means of assessing policy performance. Part of the problem here is that ATSIC regions did not exist in 1986; 1991 Census data, at best, provide a baseline against which to measure future change. Furthermore, information on program dollar inputs to regions, even from ATSIC alone, have not been accurately delineated at the regional level, especially for national programs (as distinct from discretionary regional programs). Furthermore, because census data are only available five-yearly, and usually two years after collection, it is difficult to correlate social indicators derived from these data with government expenditure. This is especially the case because global allocations to regions from all Commonwealth departments, as well as State and local governments and other sources, are not generally available at the regional level.

For these reasons, the major emphasis here is only on the first usage outlined above: the data and analysis here are targeted primarily at ATSIC

regional councils for regional planning purposes and for bottom-up resource-bidding purposes.

**Previous data analysis**

Examination of earlier analyses of census data by ATSIC regions highlights just how exploratory such exercises have been. In 1991, Tesfaghiorghis (1991b) disaggregated census data by State and section-of-State to highlight socioeconomic variation by geographic regions. Subsequently, Tesfaghiorghis (1991a) undertook the first analysis of socioeconomic variation at the ATSIC regional council level using 1986 Census data. It is not our intention to summarise Tesfaghiorghis's work here, but merely to highlight his methodological approach. He examined eight variables including population, percentage at school aged 15-24 years, percentage qualified, employment/population ratio, labour force participation, unemployment rate, annual median income and home ownership levels. These eight variables provided some basis for assessing regional variations, but an overarching socioeconomic status index was needed to make this array of variables manageable.

Tesfaghiorghis chose three variables: percentage qualified, employment/population ratio and median individual income. Tesfaghiorghis created a positive index and assigned scores to each of the three variables depending on their links with the arithmetic mean for all regions. Index scores varied from a low of 4.8 for Fitzroy Crossing Regional Council (now a part of Derby Regional Council) to a high of 19.2 for Bogong Regional Council (now a part of Queanbeyan Regional Council). Tesfaghiorghis divided his ISA into four regional advantage scores termed high, moderately high, average and low: these were mapped across the Australian continent to highlight regional variation (see Tesfaghiorghis 1991a: 9).[4]

Khalidi (1992) developed Tesfaghiorghis's (1991a) work in three ways. First, rather than develop an index of socioeconomic advantage, he developed an index of socioeconomic disadvantage utilising eight variables: dependency ratio, child/woman ratio, proportion left school at age less than 15 years, proportion never attended school, proportion with individual income less than $6,001, unemployment/population ratio, non-home ownership (proportion who do not own or are not purchasing their homes), and dwelling occupancy ratio. The higher the value of his composite index, the greater the socioeconomic disadvantage.

Second, Khalidi introduced an intercensal dimension to his analysis, comparing his Index of Socio-Economic Disadvantage (ISED) for 1986 with historical data for 1976. Finally, at an aggregate level Khalidi compared his ISED for indigenous and non-indigenous Australians. Like

Tesfaghiorghis (1991a), Khalidi created Regional Disadvantage Scores (RDSs) divided into three categories: least disadvantaged, disadvantaged and highly disadvantaged. Khalidi demonstrated a significant decline in disadvantage, in both absolute and relative terms, over the ten years 1976 to 1986, although the extent of this decline may have been overstated by an oversight: the important economic 'proportion with individual income less than $6,001' was not adjusted for the impact of inflation. The use of unadjusted income data can have a marked impact on the ISED. We have not extended our analysis back to 1976 because of data problems in the 1976 Census (Altman and Gaminiratne 1992); also data are not readily available that far back disaggregated to 1993 ATSIC regional councils.

## Data sources and caveats

The information used in this paper are 1986 and 1991 Census data disaggregated to the ATSIC regional council level. These data are made available to the Centre for Aboriginal Economic Policy Research (CAEPR) by ATSIC's Statistics Section. To some extent this is a positivist paper that is data-driven, being based on the availability of 1986 and 1991 Census data disaggregated to the 36 ATSIC regional council jurisdictions established in 1993.[5] This is not, however, merely an abstract exercise; CAEPR has been requested to analyse the diversity in the socioeconomic status of indigenous Australians at the regional level and the only data currently available are from the five-yearly census.[6] This total dependence on census data will cease when results from the National Aboriginal and Torres Strait Islander Survey are available early in 1995.

A fundamental conundrum exists in using census data to assess the relative socioeconomic status of indigenous Australians. It has been pointed out that the data available on indigenous Australians is only a by-product, a reflection of the fact that an ethnic identifier (currently based on a question about racial origin) exists as a census question. However, the five-yearly census is first and foremost about the total Australian population and social scientists remain concerned that any census questions that measure socioeconomic status will only reflect the normative standards of the dominant society (Altman 1988; Altman 1992).[7] In particular, the geographical location of a significant proportion of the indigenous population away from mainstream opportunities in education and employment biases against its wellbeing in mainstream terms, a fact demonstrated by a number of studies of indigenous economic status by section-of-State (Tesfaghiorghis 1991b; Taylor 1993a). It is of added concern that for both the 1986 and 1991 Censuses, census geography has had to be reconstituted to fit changed (or in the former year non-existent) regional council jurisdictions. Some exercises in reconstituting boundaries, for example by Altman and Gaminiratne (1992), have cast doubt on the validity of disaggregating census data to regional council levels.

An additional issue is that data available at the regional council level do not differentiate between Aboriginal people and Torres Strait Islanders. This is a potential problem for two reasons. First, considerable doubt has been raised about the accuracy of the Torres Strait Islander count in some States in the 1991 Census (see Gaminiratne 1992; Evans, Kahles and Bate 1993; Arthur and Taylor 1994). This, in turn, means that mainland regional councils with a relatively high Torres Strait Islander population could experience problems with data accuracy. Second, Taylor and Gaminiratne (1993) and Taylor (1993b) have demonstrated that Torres Strait Islanders have, on average, an intermediate socioeconomic position between Aboriginal Australians and non-indigenous Australians. This again implies that those mainland regional councils with a higher proportion of Torres Strait Islanders will, in all likelihood, have a higher socioeconomic status, but this influence cannot be quantitatively demonstrated at the regional level from the data currently available.

## Social indicators

The analysis undertaken here is intentionally simplified: we only examine three socioeconomic indicators, the employment/population ratio, the ratio of persons aged 15 to 64 years with post-school qualifications, and median income. These three variables are examined for 36 regional councils. These particular variables have been chosen and are presented because they are of central significance to the employment, income and educational equality goals of the AEDP and AEP (see Bamblett 1994; Yunupingu 1994). They are also among the least amenable to undue cross-cultural ambiguity and, when combined into one index, they replicate the index of socioeconomic advantage used by Tesfaghiorghis (1991a). But it must be emphasised that our choice is subjective and represents only three of twenty-five variables that we initially examined and that have been tabulated for the 36 ATSIC regional councils. These variables, described in Appendix 1, have been lodged with ATSIC's Statistics Section, and are readily available for any regional council that wishes to utilise these data for planning purposes.

Table 1 presents information on the names of the 36 regional councils, which have already changed once since 1993; regional councils are also grouped into ATSIC Zones and into ATSIC administrative regional office jurisdictions. Changes in nomenclature do present some difficulty for analysts, as indicated by Altman and Gaminiratne (1992) when attempting to contrast their findings for 60 regions with the same, but differently named, jurisdictions. Regional council jurisdictions are depicted geographically in Figures 1 to 3 below.

## Table 1. ATSIC Regional Council details, 1994.

| State (Zone) | Regional council (current name) | Regional council (previous name) | Regional office |
|---|---|---|---|
| NSW East | Kamilaroi | Tamworth | Tamworth |
| | NE Indigenous | Coffs Harbour | Lismore |
| NSW West | Murdi Paaki | Bourke | Bourke |
| | Binaal Billa | Wagga Wagga | Wagga Wagga |
| | Queanbeyan | Queanbeyan | Queanbeyan |
| NSW Metropolitan | Sydney | Sydney | Sydney |
| Victoria | Tumbukka | Ballarat | Melbourne s/o |
| | Binjirru | Wangaratta | Melbourne s/o |
| Qld South | Goolburri | Roma | Roma |
| | Central Qld | Rockhampton | Rockhampton |
| Qld Metropolitan | SE Qld Indigenous | Brisbane | Brisbane |
| Qld North | Townsville | Townsville | Townsville |
| | Cairns and District | Cairns | Cairns |
| Qld Far North West | Mt Isa and Gulf | Mount Isa | Mt Isa |
| | Peninsula | Cooktown | Cairns |
| Torres Strait | TSRA[a] | Torres Strait | TSRA |
| South Australia | Patpa Warra Yunti | Adelaide | Adelaide |
| | Wangka-Wilurrara | Ceduna | Ceduna |
| | Nulla Wimila Kutju | Port Augusta | Port Augusta |
| WA South West | Kaata-Wangkinyiny | Narrogin | East Perth |
| | Icarlarnyiny | Perth | East Perth |
| WA South East | Wongatha | Kalgoorlie | Kalgoorlie |
| | Western Desert | Warburton | Kalgoorlie |
| WA Central | Geraldton | Geraldton | Geraldton |
| | Ngarda-Ngarli-Yarndu | South Hedland | South Hedland |
| WA North | Kullarri | Broome | Broome |
| | Derby | Derby | Derby |
| | Wunan | Kununurra | Kununurra |
| Tasmania | Tasmanian Regional Aboriginal | Hobart | Hobart s/o |
| NT Central | Alice Springs | Alice Springs | Alice Springs |
| | Papunya | Apatula | Alice Springs |
| | Yapakurlangu | Tennant Creek | Tennant Creek |
| NT North | Yilli Rreung | Darwin | Darwin |
| | Jabiru | Jabiru | Darwin |
| | Garak-Jarru | Katherine | Katherine |
| | Miwatj | Nhulunbuy | Nhulunbuy |

a. Torres Strait Regional Authority.

**Table 2. Selected population and demographic characteristics for 36 ATSIC regions, 1986 and 1991.**

| Region | Total population | | Working-age population | | Working-age population (%) | |
|---|---|---|---|---|---|---|
| | 1986 | 1991 | 1986 | 1991 | 1986 | 1991 |
| Alice Springs | 3,801 | 4,000 | 2,261 | 2,417 | 59.5 | 60.4 |
| Binaal Billa | 11,301 | 12,776 | 6,259 | 7,093 | 55.4 | 55.5 |
| Binjirru | 6,110 | 8,156 | 3,678 | 4,957 | 60.2 | 60.8 |
| Cairns and District | 10,260 | 11,059 | 5,898 | 6,414 | 57.5 | 58.0 |
| Central Qld | 6,953 | 8,083 | 3,966 | 4,545 | 57.0 | 56.2 |
| Derby | 3,256 | 3,828 | 1,868 | 2,215 | 57.4 | 57.9 |
| Garak-Jarru | 5,188 | 6,212 | 2,951 | 3,419 | 56.9 | 55.0 |
| Geraldton | 4,298 | 4,385 | 2,402 | 2,436 | 55.9 | 55.6 |
| Goolburri | 5,220 | 6,195 | 2,842 | 3,442 | 54.4 | 55.6 |
| Icarlarnyiny | 10,313 | 12,099 | 6,069 | 6,869 | 58.9 | 56.8 |
| Jabiru | 5,670 | 7,250 | 3,289 | 4,290 | 58.0 | 59.2 |
| Kaata-Wangkinyiny | 5,162 | 5,420 | 2,754 | 2,995 | 53.4 | 55.3 |
| Kamilaroi | 7,412 | 8,499 | 4,207 | 4,696 | 56.8 | 55.3 |
| Kullarri | 2,473 | 3,166 | 1,353 | 1,701 | 54.7 | 53.7 |
| Miwatj | 5,155 | 5,936 | 2,991 | 3,483 | 58.0 | 58.7 |
| Mt Isa and Gulf | 5,906 | 5,947 | 3,366 | 3,391 | 57.0 | 57.0 |
| Murdi Paaki | 5,844 | 5,969 | 3,402 | 3,462 | 58.2 | 58.0 |
| NE Indigenous | 12,045 | 15,876 | 6,860 | 9,142 | 57.0 | 57.6 |
| Ngarda-Ngarli-Yarndu | 3,668 | 4,194 | 2,186 | 2,436 | 59.6 | 58.1 |
| Nulla Wimila Kutju | 4,837 | 5,233 | 2,793 | 3,024 | 57.7 | 57.8 |
| Papunya | 6,182 | 6,113 | 3,464 | 3,555 | 56.0 | 58.2 |
| Patpa Warra Yunti | 8,024 | 9,459 | 4,710 | 5,551 | 58.7 | 58.7 |
| Peninsula | 4,420 | 5,724 | 2,707 | 3,574 | 61.2 | 62.4 |
| Queanbeyan | 4,837 | 5,769 | 2,833 | 3,381 | 58.6 | 58.6 |
| SE Qld Indigenous | 13,535 | 16,261 | 7,792 | 9,411 | 57.6 | 57.9 |
| Sydney | 18,792 | 22,905 | 11,334 | 13,877 | 60.3 | 60.6 |
| Tas. Reg. Aboriginal | 6,716 | 8,885 | 3,799 | 5,011 | 56.6 | 56.4 |
| TSRA | 5,043 | 5,617 | 2,726 | 2,960 | 54.1 | 52.7 |
| Townsville | 9,932 | 11,238 | 5,695 | 6,443 | 57.3 | 57.3 |
| Tumbukka | 6,501 | 8,579 | 3,841 | 4,861 | 59.1 | 56.7 |
| Wangka-Wilurrara | 1,430 | 1,540 | 849 | 870 | 59.4 | 56.5 |
| Western Desert | 2,459 | 2,406 | 1,440 | 1,399 | 58.6 | 58.1 |
| Wongatha | 2,362 | 2,567 | 1,388 | 1,445 | 58.8 | 56.3 |
| Wunan | 3,781 | 3,713 | 2,063 | 2,016 | 54.6 | 54.3 |
| Yapakurlangu | 2,256 | 3,074 | 1,300 | 1,792 | 57.6 | 58.3 |
| Yilli Rreung | 6,486 | 7,325 | 3,745 | 4,308 | 57.7 | 58.8 |
| Mean | 6,323 | 7,374 | 3,641 | 4,247 | 57.5 | 57.3 |
| SD | 3,583 | 4,423 | 2,110 | 2,618 | 1.9 | 2.0 |
| Coeff. var (%) | 57 | 60 | 58 | 62 | 3.2 | 3.6 |

*Population*

Population size is not one of the social indicators used here to analyse socioeconomic status change but it is, rather obviously, a key variable both for planning purposes and for providing an initial indication of variability between regions. In Table 2, information about population and working-

age population is presented by regional council. There are two significant issues in this table. First, and foremost, there is very obviously marked variability in the population size of regional councils ranging from the largest, Sydney, with 22,905 indigenous Australians in 1991 to the smallest, Western Desert, with 2,406. Summary statistics indicate that the average size of regional council indigenous populations averaged 7,374 in 1991, with a standard deviation (SD) of 4,423 and a high coefficient of variation of 60 per cent.[8] Furthermore, as the geographic jurisdictions shown in Figures 1 to 3 indicate, there is also enormous variation in the area of each regional council. Hence whatever the relative wellbeing of regional councils in relation to each other, for planning purposes population variation, and in particular cost diseconomies of small scale and disabilities associated with large geographic size, need to be considered. Second, information is also presented in Table 2 about the working-age population (15-64 years). While in absolute terms this population also demonstrates marked variability, in proportional terms there is remarkable similarity between the 36 regions, as demonstrated by the SD for 1991 of 2 per cent and the coefficient of variation of only 3.6 per cent. It is important to note that high intercensal mobility of indigenous Australians between regions means that any examination of socioeconomic status over time is not analysing the same group. This issue has been examined in some detail by Taylor and Bell (1994).

*Educational status*

It has been clearly demonstrated using available official statistics that indigenous Australians have a relatively low formal educational status (Yunupingu 1994). The focus in the analysis here is only on qualification level, with the distinction being drawn between persons aged 15-64 years who have obtained and have not obtained some formal qualification since leaving school.

In Table 3, information is provided for the 36 ATSIC regions on the proportion of the working-age population who had acquired post-school qualifications. In 1986, this proportion ranged from 1.8 per cent at Papunya to over 17 per cent in a number of regional councils (Sydney, Tumbukka, Binjirru and Tasmanian Regional Aboriginal). In 1991, the proportion ranged from 1.4 per cent (again Papunya) to over 16 per cent in only two regional councils (Sydney and Binjirru). In 1986, the mean proportion of persons aged 15-64 years with qualifications was 9 per cent (SD 4.8 per cent), declining slightly to 7.5 per cent (SD 4.3 per cent) in 1991. As a general rule, the proportion with qualifications was higher in urban rather than rural and remote regional councils, reflecting in part educational opportunities and in part the potential to convert such qualifications to labour market outcomes. Given the concerted policy efforts to increase educational status for indigenous Australians since the launch of the AEP in 1989, this apparent decline is surprising and probably needs to be qualified a little.

**Table 3. Selected socioeconomic indicators for 36 ATSIC regions, 1986 and 1991.**

| Region | Proportion qualified 1986 | Proportion qualified 1991 | Employment/ population ratio 1986 | Employment/ population ratio 1991 | Median income 1986 | Median income 1991 |
|---|---|---|---|---|---|---|
| Alice Springs | 7.3 | 6.6 | 31.4 | 31.2 | 10,563 | 8,921 |
| Binaal Billa | 11.3 | 10.2 | 28.5 | 30.8 | 8,171 | 9,185 |
| Binjirru | 18.0 | 16.2 | 47.2 | 46.7 | 11,128 | 11,058 |
| Cairns and District | 9.7 | 7.9 | 23.7 | 31.7 | 7,360 | 9,301 |
| Central Qld | 7.7 | 7.7 | 38.1 | 38.5 | 9,418 | 9,308 |
| Derby | 8.4 | 3.2 | 27.7 | 46.0 | 6,923 | 7,814 |
| Garak-Jarru | 5.2 | 3.6 | 29.1 | 44.3 | 8,511 | 8,052 |
| Geraldton | 6.8 | 5.2 | 26.3 | 26.7 | 8,383 | 9,248 |
| Goolburri | 6.0 | 5.4 | 33.9 | 30.8 | 9,001 | 9,309 |
| Icarlarnyiny | 13.4 | 11.4 | 26.6 | 29.3 | 7,800 | 9,597 |
| Jabiru | 3.9 | 2.9 | 21.2 | 25.1 | 9,184 | 6,850 |
| Kaata-Wangkinyiny | 6.9 | 5.2 | 22.7 | 23.8 | 7,386 | 8,939 |
| Kamilaroi | 10.5 | 9.7 | 24.8 | 28.5 | 7,659 | 9,154 |
| Kullarri | 10.0 | 7.3 | 31.8 | 37.1 | 8,987 | 8,702 |
| Miwatj | 3.1 | 2.0 | 27.2 | 22.7 | 11,004 | 8,230 |
| Mt Isa and Gulf | 5.9 | 5.7 | 42.0 | 44.8 | 10,924 | 9,701 |
| Murdi Paaki | 6.4 | 4.8 | 21.4 | 31.3 | 7,420 | 8,731 |
| NE Indigenous | 13.5 | 12.6 | 27.1 | 33.0 | 7,979 | 9,285 |
| Ngarda-Ngarli-Yarndu | 8.7 | 6.2 | 27.1 | 28.4 | 8,036 | 8,547 |
| Nulla Wimila Kutju | 5.8 | 5.8 | 34.2 | 45.8 | 7,725 | 8,639 |
| Papunya | 1.8 | 1.4 | 14.7 | 26.8 | 5,851 | 7,267 |
| Patpa Warra Yunti | 14.1 | 12.3 | 34.4 | 37.6 | 8,321 | 9,788 |
| Peninsula | 3.7 | 2.3 | 32.7 | 56.8 | 8,873 | 7,753 |
| Queanbeyan | 15.3 | 13.5 | 40.7 | 41.1 | 9,756 | 10,993 |
| SE Qld Indigenous | 14.6 | 13.6 | 38.5 | 40.0 | 9,514 | 10,340 |
| Sydney | 17.8 | 16.1 | 43.6 | 46.3 | 10,877 | 11,777 |
| Tas. Reg. Aboriginal | 17.2 | 14.0 | 49.1 | 47.9 | 10,388 | 11,060 |
| TSRA | 9.4 | 8.2 | 36.5 | 49.1 | 10,678 | 10,153 |
| Townsville | 8.7 | 8.0 | 32.5 | 41.8 | 8,702 | 9,898 |
| Tumbukka | 17.4 | 13.0 | 42.0 | 42.7 | 9,808 | 10,597 |
| Wangka-Wilurrara | 6.0 | 6.4 | 33.2 | 39.1 | 8,988 | 8,457 |
| Western Desert | 0.8 | 1.4 | 37.6 | 35.4 | 5,703 | 5,866 |
| Wongatha | 6.3 | 6.4 | 22.5 | 25.3 | 6,667 | 9,002 |
| Wunan | 4.8 | 3.4 | 31.0 | 37.4 | 7,267 | 8,034 |
| Yapakurlangu | 3.5 | 1.7 | 20.1 | 22.0 | 8,509 | 7,581 |
| Yilli Rreung | 12.9 | 10.3 | 35.8 | 32.7 | 12,301 | 10,660 |
| Mean | 9.0 | 7.5 | 31.6 | 36.1 | 8,771 | 9,105 |
| SD | 4.8 | 4.3 | 8.0 | 8.7 | 1,549 | 1,272 |
| Coeff. var. (%) | 53.3 | 57.3 | 25.3 | 24.2 | 18 | 14 |

First, measuring educational qualifications has proved difficult; for some regional councils a high proportion of the population aged 15-64 years did not state their qualifications. In 1986, the not-stated category accounted for over 30 per cent of persons aged 15-64 years in two regional councils

(Peninsula and Western Desert) and averaged 17.8 per cent of respondents (SD 7.1 per cent). In 1991, this mean proportion had declined to 12.6 per cent (SD 4 per cent). The intercensal decline in the not-stated category between 1986 and 1991 may in itself indicate an increase in educational status. Second, as indicated in Table 2, the indigenous population has increased markedly and those in the large 15-19 years of age cohort may still be in the process of gaining post-school qualifications. Finally, this may reflect the long lead time required for the measurement of improved educational outcomes. It is possible that these will not be evident until the 1996 Census.

*Employment status*

Aboriginal employment is measured here by the employment/population ratio, the ratio of employed persons aged 15-64 years to the total population aged 15-64 years expressed in percentage terms. It has been noted elsewhere that this is probably the most appropriate way to assess indigenous employment status being preferable to other measures like the unemployment rate that often also reflects the discouraged worker effect (Tesfaghiorghis 1991a; Smith 1994). This variable is presented in Table 3 for the 36 ATSIC regions for 1986 and 1991. In 1986, the employment/population ratio ranged from a high of 49 per cent in Tasmanian Regional Aboriginal to a low of just 14 per cent at Papunya. The mean ratio was 31.6 per cent in 1986 (SD 8 per cent). In 1991, the highest employment/population ratio was recorded in Peninsula (57 per cent) and the lowest in Yapakurlangu (22 per cent). The mean ratio had increased to 36 per cent (SD 9 per cent). This increase in employment is broadly consistent with previous findings based on official census statistics (Taylor 1993b).

One factor that has greatly influenced this variable in the intercensal period is the expansion of the Community Development Employment Projects (CDEP) scheme, a work-for-the-dole labour market program. The expansion of this scheme has been a key element in employment growth in the intercensal period as outlined by Taylor (1993b) and Bamblett (1994). Unfortunately, because persons employed under the CDEP scheme are not differentiated in official statistics, it is impossible to accurately assess intercensal employment growth net of the scheme (Gregory and Daly 1994).

*Income status*

Median annual individual income at the regional council level is used as the measure of indigenous income status. In 1986, median income ranged from over $11,128 in Binjirru to a low of $5,703 in Western Desert. Mean median income in 1986 was $8,771 (SD $1,549). In 1991, the range was from a high of over $11,000 in three regions (Sydney, Binjirru and Tasmanian Regional Aboriginal) to a low of $6,850 in Jabiru. The mean median income in 1991 was $9,105 (SD $1,272). This represented a decline in income in real dollar terms.

Interestingly, the coefficient of variation for the median income variable in Table 3 is lower than for the education or employment variable, and declined between 1986 and 1991 despite a slight increase in median income. This suggests a degree of compression of indigenous incomes, possibly caused by the expansion of the CDEP scheme as participants in the scheme generally face income ceilings slightly above welfare benefit entitlements. It is also possible that with the rapid expansion in CDEP scheme participation in the intercensal period, some individuals who were outside the social security safety net may have become included under the scheme. While in general median income appears higher in urban areas, it should be noted that the census only seeks to quantify cash income from formal sources; cash income from informal sources and imputed income from subsistence activities are not generally quantified in the census. Such sources of income can be significant in some rural and remote situations (Altman and Allen 1992).

*Interrelationships between variables*

One might hypothesise that there would be a high correlation between the three variables described above in 1986 and in 1991. It is in fact the case that the Spearman's rank correlation coefficient is positive for all three variables and in the case of education has a very high value of 0.95.[9] The correlation coefficient for income and employment, however, is somewhat lower. In the case of employment, this is primarily because of the CDEP scheme factor: the scheme was not introduced to areas on the basis of relative employment need. The introduction of the scheme is very much client-driven, with a requirement in discrete indigenous communities that introduction be based on consensus. Because there has been a degree of randomness in the scheme's introduction, its effects on incomes are also random.

The relationships between variables can be determined for each year by using the Pearson correlation coefficient. For example, it is a standard assumption of labour economics that employment outcomes are positively influenced by educational qualifications (so-called 'human capital' theory) and that income is positively influenced by employment. Despite the potential for perverse results for the indigenous population due to the absence of labour markets in some remote regions, correlations are always positive. Interestingly though, the Pearson correlation between education and employment was higher in 1986 (0.59) than in 1991 (0.32), reflecting in part that education (as measured here) was not needed for CDEP scheme employment; and perhaps owing to the general downturn in labour market conditions by 1991 which may have resulted in a lower guarantee of employment with education. The Pearson correlation between employment and income is 0.63 in 1986 and 0.35 in 1991. The lower correlation coefficient in the latter year again demonstrates the effect of the CDEP scheme: participation in the scheme, defined as 'employment' for census purposes, did little to increase income levels much beyond social security

entitlements. Interestingly, the correlation between qualifications and income rose from 0.45 in 1986 to 0.88 in 1991, indicating that in a recession-affected labour market there was a strong relationship between educational qualifications and income levels. This analysis at the regional level replicates similar general findings for the indigenous population in aggregate (Daly 1993, 1994).

## An Index of Socioeconomic Advantage and regional variation

Discussion about regional variations in socioeconomic status can be further developed by using a single index of socioeconomic advantage derived from the three variables discussed above and calculated for the total indigenous population of each region. The three variables used here are percentage qualified, the employment/population ratio and median individual income. Scores were assigned for each region on each of the three indicators as follows: a score of 3 if the indicator for a particular region is equal to the mean of the distribution; a score of 4 if the value for the region is plus one standard deviation and 2 if it is less by one standard deviation; a score of 5 or 1 if it is two standard deviations higher or lower. The scores on each of the three indicators for each region are then added to obtain an overall index, which ascribes equal weight to each of the indicators (Tesfaghiorghis 1991a).[10] The regions are divided into four groups by the median, first quartile and third quartile, and are then arbitrarily defined as least, less, more and most advantaged. These four categories are then further simplified into four Regional Advantage Scores (RASs) ranging from 1 to 4 which are presented in mapped figures with four shades, the darker the shade the more advantaged the region. In Figure 1, the 1986 RAS is mapped for ATSIC regions.

*Index of Socioeconomic Advantage, 1986*

The ISA calculated for 1986 is presented in column 1 of Table 4. This ranges from a low of 3.5 for Papunya to a high of 14.0 for Tasmanian Regional Aboriginal. The 1986 quartile groupings and their ISA scores are presented in Table 5; Figure 1 presents these 1986 quartiles as a map. There are a few interesting features of this analysis of the 1986 Census data. First, it accords broadly with similar analyses undertaken for 60 regions by Tesfaghiorghis (1991a) and Khalidi (1992). As a general rule, the relatively most advantaged regions are either in the more densely populated southeast or else are regions that encompass a major urban area or State or Territory capital city. There are exceptions to this generalisation. Icarlarnyiny Regional Council that includes Perth is, somewhat surprisingly, less advantaged, while Patpa Warra Yunti which includes Adelaide is only more advantaged. Conversely, the remote TSRA was in the most advantaged category primarily because, as noted above, regions with a high proportion of Torres Strait Islanders will be relatively well off.[11]

**Table 4. Index of Socioeconomic Advantage (ISA) for 36 ATSIC regions, 1986 and 1991.**

| Region | 1986 ISA | 1991 ISA | Change ISA | 1986 CDEP | 1991 CDEP | Change CDEP |
|---|---|---|---|---|---|---|
| Alice Springs | 9.8 | 8.1 | -1.7 | 0 | 199 | 199 |
| Binaal Billa | 8.7 | 9.1 | 0.4 | 0 | 185 | 185 |
| Binjirru | 14.4 | 13.8 | -0.6 | 0 | 109 | 109 |
| Cairns and District | 7.3 | 8.7 | 1.5 | 0 | 633 | 633 |
| Central Qld | 10.0 | 9.5 | -0.5 | 0 | 500 | 500 |
| Derby | 7.2 | 8.1 | 0.9 | 0 | 1,159 | 1,159 |
| Garak-Jarru | 7.7 | 8.2 | 0.5 | 111 | 1,250 | 1,139 |
| Geraldton | 7.6 | 7.5 | -0.1 | 0 | 46 | 46 |
| Goolburri | 8.8 | 8.1 | -0.8 | 0 | 0 | 0 |
| Icarlarnyiny | 8.7 | 9.5 | 0.8 | 0 | 0 | 0 |
| Jabiru | 6.9 | 4.9 | -2.0 | 0 | 721 | 721 |
| Kaata-Wangkinyiny | 6.6 | 6.9 | 0.4 | 0 | 0 | 0 |
| Kamilaroi | 7.8 | 8.7 | 0.9 | 0 | 219 | 219 |
| Kullarri | 9.4 | 8.7 | -0.7 | 256 | 416 | 160 |
| Miwatj | 8.7 | 5.5 | -3.2 | 609 | 827 | 218 |
| Mt Isa & Gulf | 11.1 | 10.0 | -1.0 | 675 | 1,027 | 352 |
| Murdi Paaki | 6.3 | 7.5 | 1.2 | 0 | 715 | 715 |
| NE Indigenous | 8.9 | 10.0 | 1.1 | 0 | 279 | 279 |
| Ngarda-Ngarli-Yarndu | 7.9 | 7.4 | -0.6 | 0 | 285 | 285 |
| Nulla Wimila Kutju | 8.0 | 9.4 | 1.4 | 890 | 1,344 | 454 |
| Papunya | 3.5 | 5.1 | 1.6 | 0 | 804 | 804 |
| Patpa Warra Yunti | 10.1 | 10.8 | 0.7 | 0 | 0 | 0 |
| Peninsula | 8.1 | 9.1 | 1.0 | 549 | 3,178 | 2,629 |
| Queanbeyan | 12.1 | 12.4 | 0.3 | 0 | 46 | 46 |
| SE Qld Indigenous | 11.5 | 11.8 | 0.3 | 0 | 0 | 0 |
| Sydney | 13.7 | 14.3 | 0.5 | 0 | 86 | 86 |
| Tas. Reg. Aboriginal | 14.0 | 13.4 | -0.6 | 0 | 0 | 0 |
| TSRA | 10.9 | 11.5 | 0.5 | 181 | 979 | 798 |
| Townsville | 9.0 | 10.4 | 1.4 | 0 | 753 | 753 |
| Tumbukka | 12.7 | 12.2 | -0.6 | 0 | 0 | 0 |
| Wangka-Wilurrara | 8.7 | 8.6 | -0.2 | 200 | 278 | 78 |
| Western Desert | 6.1 | 5.0 | -1.1 | 1,097 | 1,123 | 26 |
| Wongatha | 6.0 | 7.4 | 1.5 | 0 | 29 | 29 |
| Wunan | 7.1 | 7.4 | 0.3 | 414 | 938 | 524 |
| Yapakurlangu | 6.3 | 4.8 | -1.4 | 0 | 345 | 345 |
| Yilli Rreung | 12.6 | 10.5 | -2.2 | 0 | 0 | 0 |
| Mean | 9 | 9 | 0 | 138 | 513 | 375 |
| SD | 3 | 2 | 1 | 281 | 627 | 511 |
| Coef. var. (%) | 28 | 27 | | 203 | 122 | 136 |

The Mt Isa and Gulf Regional Council and the Kullari Regional Council were also in the most advantaged and more advantaged categories respectively, appearing somewhat anomalous. It is difficult to assess the reasons for these apparently anomalous regions: in both cases, urban centres (Mt Isa and Broome) may have had a positive impact on

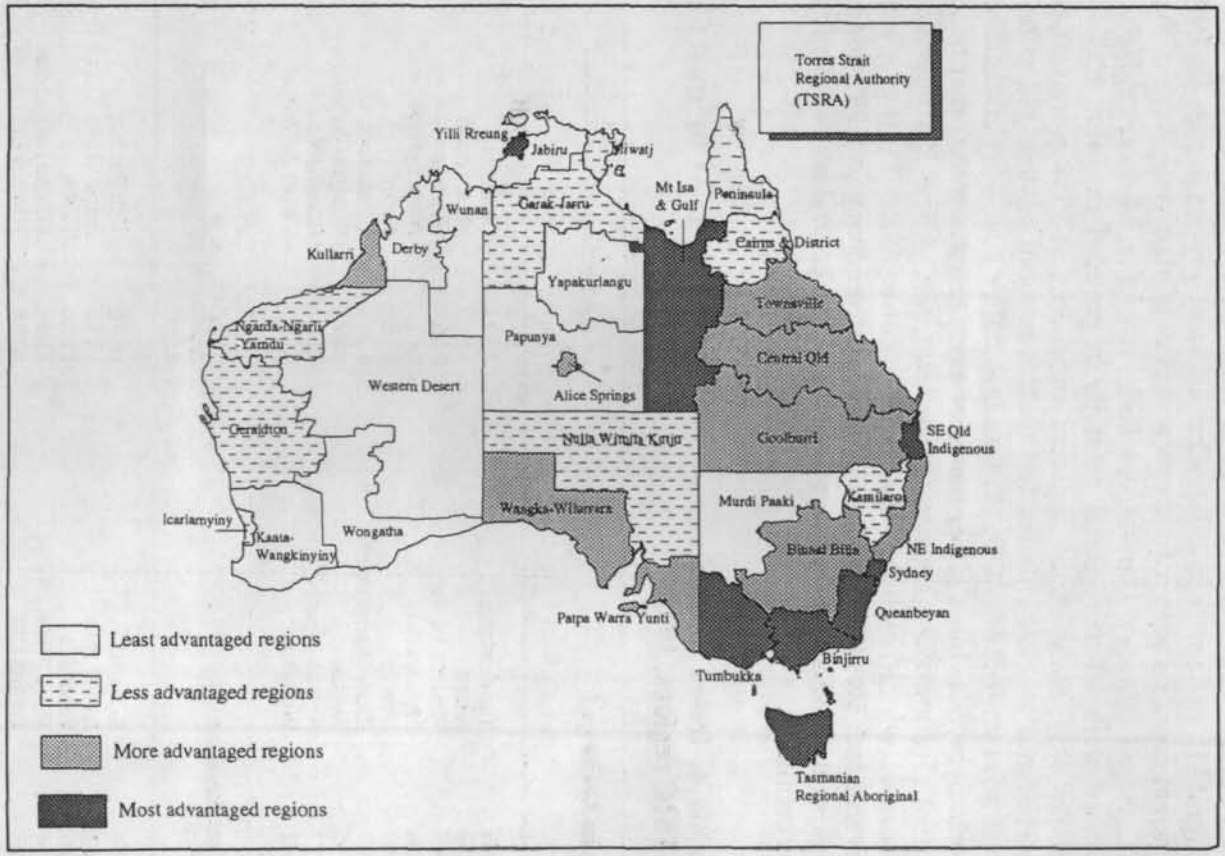
socioeconomic opportunity; it is also possible that data problems may have had an influence. Murdi Paaki Regional Council in the northwest of New South Wales stands out as the only region in the southeastern States that is least advantaged.

**Table 5. Index of Socioeconomic Advantage (ISA) by quartiles for ATSIC regions, 1986.**

| Least Advantaged (1) | | Less Advantaged (2) | |
|---|---|---|---|
| 3.50 | Papunya | 7.26 | Cairns & District |
| 5.95 | Wongatha | 7.63 | Geraldton |
| 6.05 | Western Desert | 7.74 | Garak-Jarru |
| 6.25 | Yapakurlangu | 7.75 | Kamilaroi |
| 6.31 | Murdi Paaki | 7.92 | Ngarda-Ngarli-Yarndu |
| 6.56 | Kaata-Wangkinyiny | 7.98 | Nulla Wimila Kutju |
| 6.89 | Jabiru | 8.09 | Peninsula |
| 7.08 | Wunan | 8.65 | Miwatj |
| 7.21 | Derby | 8.69 | Icarlarnyiny |
| **More Advantaged (3)** | | **Most Advantaged (4)** | |
| 8.72 | Binaal Billa | 10.94 | TSRA |
| 8.72 | Wangka-Wilurrara | 11.05 | Mt Isa & Gulf |
| 8.82 | Goolburri | 11.53 | SE Qld Indigenous |
| 8.87 | NE Indigenous | 12.12 | Queanbeyan |
| 9.00 | Townsville | 12.63 | Yilli Rreung |
| 9.39 | Kullarri | 12.74 | Tumbukka |
| 9.79 | Alice Springs | 13.72 | Sydney |
| 9.97 | Central Qld | 13.97 | Tas. Reg. Aboriginal |
| 10.13 | Patpa Warra Yunti | 14.37 | Binjirru |

First quartile is 7.25, median is 8.70 and third quartile is 10.34.

**Figure 1. Regional Advantage Score for ATSIC regions, 1986 Census.**



*Index of Socioeconomic Advantage, 1991*

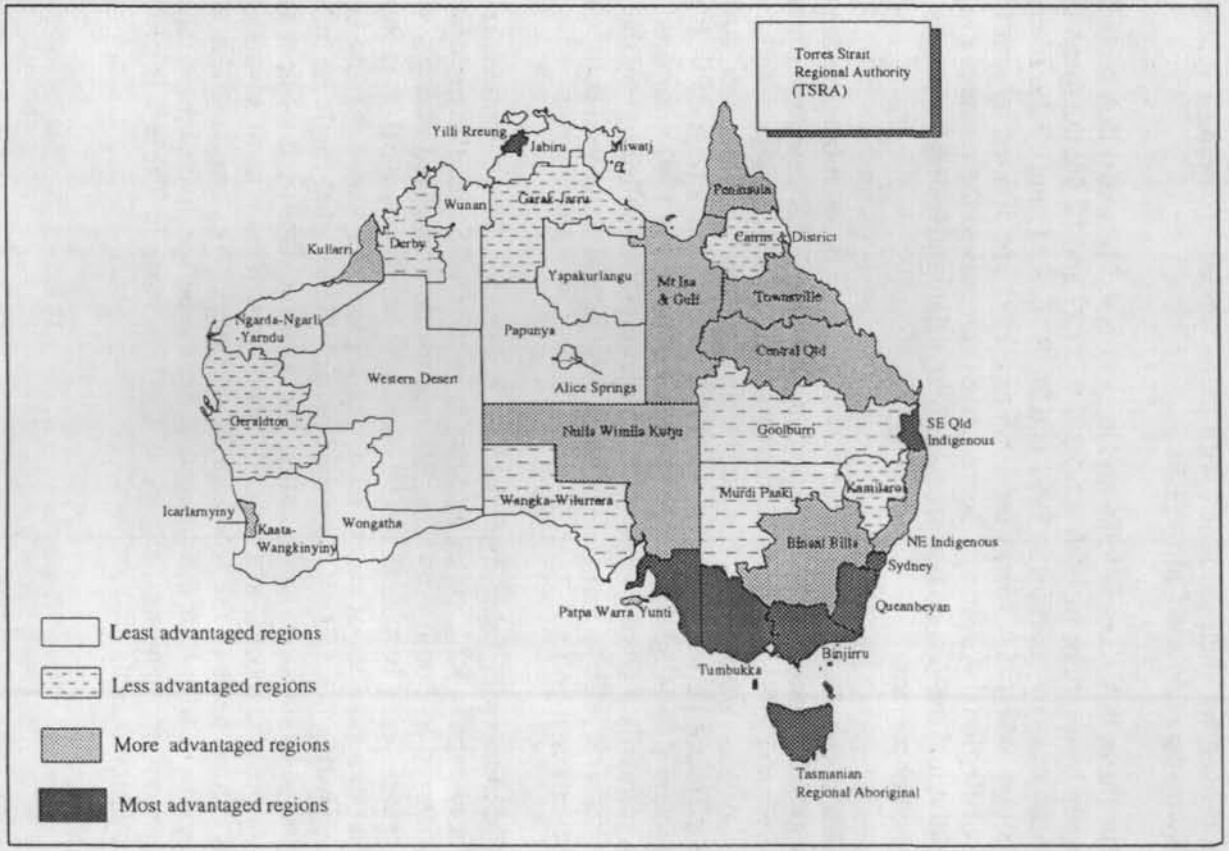
The ISA calculated for 1991 is presented in column 2, Table 4. This ranges from a low of 4.8 for Yapakurlangu to a high of 14.3 for Sydney. ISAs are divided by quartiles in Table 6 and mapped by RAS in Figure 2. The distribution of ATSIC regions by ISA in Table 6 and RAS Figure 2 accords more closely with other findings in the literature and produces a sharper geographic pattern than 1986 Census data. For example, in 1991, all regional councils with capital cities, except Icarlarnyiny, were in the most advantaged category. Darwin, Adelaide, Brisbane, Melbourne, Hobart and Sydney were all in regional councils in group 4 in Table 6. To put it another way, some of the apparent anomalies in 1986 were statistically ameliorated in 1991. Mt Isa and Gulf was more advantaged rather than most advantaged, Murdi Paaki was less rather than least advantaged and Icarlarnyiny was more rather than less advantaged. On the other hand, new potential anomalies appeared. For example, Alice Springs Regional Council, which includes the urban centre Alice Springs, was less advantaged. But this was part of a clearer tendency in 1991 for remote regions to be relatively worse off, especially in central and western parts of the continent.

**Table 6. Index of Socioeconomic Advantage (ISA) by quartiles for ATSIC regions, 1991.**

| Least Advantaged (1) | | Less Advantaged (2) | |
|---|---|---|---|
| 4.84 | Yapakurlangu | 7.50 | Geraldton |
| 4.89 | Jabiru | 7.51 | Murdi Paaki |
| 4.95 | Western Desert | 8.06 | Goolburri |
| 5.06 | Papunya | 8.07 | Alice Springs |
| 5.50 | Miwatj | 8.12 | Derby |
| 6.92 | Kaata-Wangkinyiny | 8.21 | Garak-Jarru |
| 7.35 | Wunan | 8.58 | Wangka-Wilurrara |
| 7.37 | Ngarda-Ngarli-Yarndu | 8.68 | Kamilaroi |
| 7.42 | Wongatha | 8.73 | Cairns & District |
| **More Advantaged (3)** | | **Most Advantaged (4)** | |
| 8.74 | Kullarri | 10.48 | Yilli Rreung |
| 9.08 | Binaal Billa | 10.82 | Patpa Warra Yunti |
| 9.09 | Peninsula | 11.46 | TSRA |
| 9.34 | Nulla Wimila Kutju | 11.83 | SE Qld Indigenous |
| 9.48 | Central Qld | 12.18 | Tumbukka |
| 9.50 | Icarlarnyiny | 12.44 | Queanbeyan |
| 9.96 | NE Indigenous | 13.38 | Tas. Reg. Aboriginal |
| 10.04 | Mt Isa & Gulf | 13.76 | Binjirru |
| 10.38 | Townsville | 14.26 | Sydney |

Note: First quartile is 7.48, median is 8.74 and third quartile is 10.41.

**Figure 2. Regional Advantage Score for ATSIC regions, 1991 Census.**



*Changes: 1986-1991*

A comparison of ISA scores in 1986 and 1991 is provided above in Table 4. Absolute changes in ISA scores indicate that these scores declined for 16 regions and improved for 20. In absolute terms, some regional councils experienced marked decline in ISA scores: for example, Miwatj declined by 3.2, Yilli Rreung by 2.2 and Jabiru by 2.0. No regional council score improved by such amounts, with major improvers being Papunya (1.6), Wongatha (1.5) and Cairns (1.5).

The mean ISA score in 1986 and in 1991 is 9. The mean ISA score for each group by quartiles in 1986 is 6.20, 7.97, 9.27 and 12.56; the mean score for each group by quartiles in 1991 is 6.04, 8.16, 9.51, and 12.29. Interestingly though, when ISA scores for 1986 and 1991 are divided by quartiles into four Regional Advantage Score (RAS) categories, the changes evident for individual regions do not necessarily translate into overall changes relative to other regions.

This is demonstrated in Table 7, where it can be seen that the majority of regional councils (24) remained in the same RAS category (quartile) in 1986 and 1991, with six improving their relative position and six being relatively worse off. Not surprisingly then, the Pearson correlation coefficient between the ISA for 1986 and 1991 is a high 0.89. It remains unclear if the slightly changed patterns observed in 1991 compared to 1986 is primarily a consequence of more accurate data collection by the ABS or whether it reflects real change in socioeconomic status as a consequence of government policy.

The changes in Table 7 are mapped in Figure 3. There is no visual pattern for change in RAS either by State or section-of-State. The greatest change occurred in South Australia; all regions demonstrated change, with two regions being better off in 1991 and one being worse off. It is interesting that in a number of cases, adjoining regions are worse off and better off suggesting that factors other than geographic location might be influencing change in socioeconomic status. The greatest stability is evident along the southeast seaboard, where nearly all regions remain most advantaged, and in central parts of the Northern Territory and Western Australia where all regions remain least advantaged. From the perspective of regional councils (bottom-up planning), change in the ISA score in Table 4 is probably of key importance.

**Figure 3. Change in Regional Advantage Score for ATSIC regions, 1986 to 1991.**

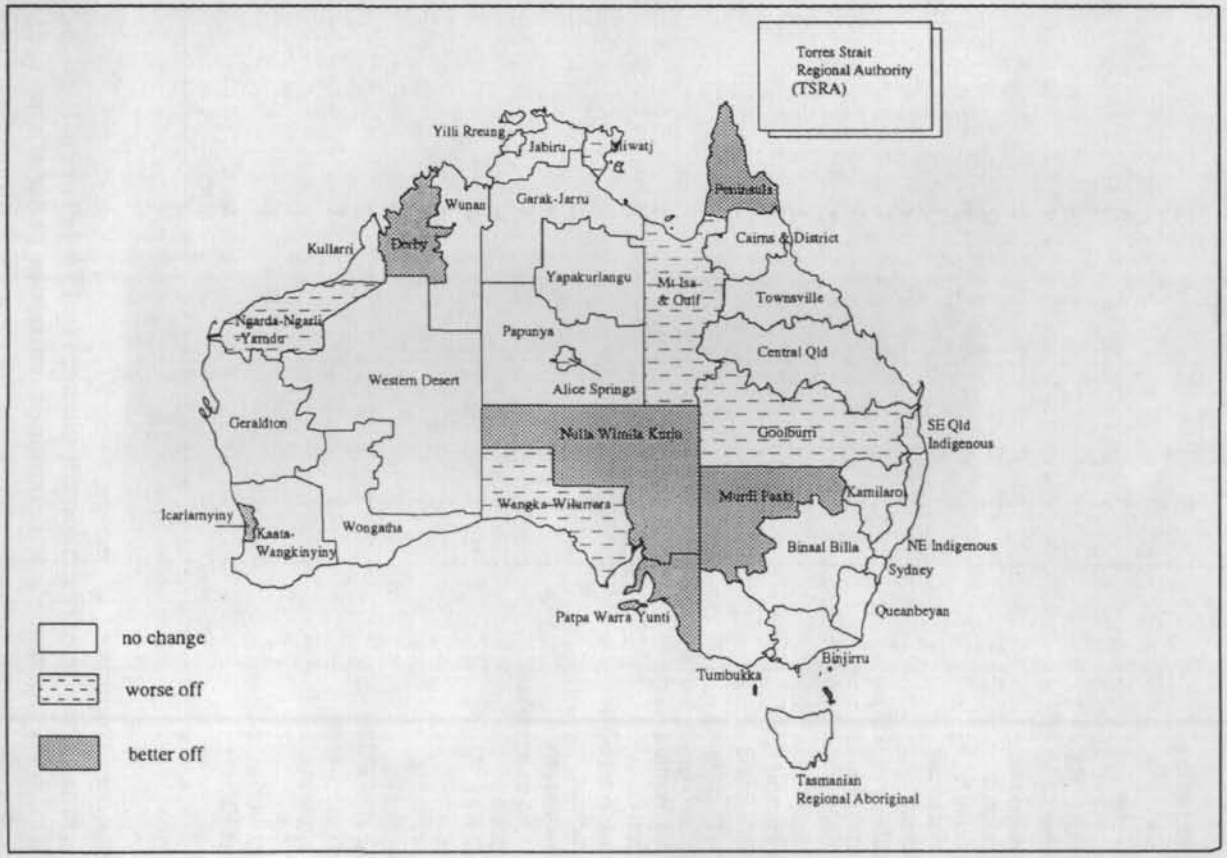


**Table 7. Regional Advantage Score (RAS) change for ATSIC regions, 1986 to 1991.**

| Region | 1986 RAS | 1991 RAS | Change RAS |
|---|---|---|---|
| Alice Springs | 3 | 2 | -1 |
| Binaal Billa | 3 | 3 | 0 |
| Binjirru | 4 | 4 | 0 |
| Cairns and District | 2 | 2 | 0 |
| Central Qld | 3 | 3 | 0 |
| Derby | 1 | 2 | 1 |
| Garak-Jarru | 2 | 2 | 0 |
| Geraldton | 2 | 2 | 0 |
| Goolburri | 3 | 2 | -1 |
| Icarlarnyiny | 2 | 3 | 1 |
| Jabiru | 1 | 1 | 0 |
| Kaata-Wangkinyiny | 1 | 1 | 0 |
| Kamilaroi | 2 | 2 | 0 |
| Kullarri | 3 | 3 | 0 |
| Miwatj | 2 | 1 | -1 |
| Mt Isa and Gulf | 4 | 3 | -1 |
| Murdi Paaki | 1 | 2 | 1 |
| NE Indigenous | 3 | 3 | 0 |
| Ngarda-Ngarli-Yarndu | 2 | 1 | -1 |
| Nulla Wimila Kutju | 2 | 3 | 1 |
| Papunya | 1 | 1 | 0 |
| Patpa Warra Yunti | 3 | 4 | 1 |
| Peninsula | 2 | 3 | 1 |
| Queanbeyan | 4 | 4 | 0 |
| SE Qld Indigenous | 4 | 4 | 0 |
| Sydney | 4 | 4 | 0 |
| Tas. Reg. Aboriginal | 4 | 4 | 0 |
| TSRA | 4 | 4 | 0 |
| Townsville | 3 | 3 | 0 |
| Tumbukka | 4 | 4 | 0 |
| Wangka-Wilurrara | 3 | 2 | -1 |
| Western Desert | 1 | 1 | 0 |
| Wongatha | 1 | 1 | 0 |
| Wunan | 1 | 1 | 0 |
| Yapakurlangu | 1 | 1 | 0 |
| Yilli Rreung | 4 | 4 | 0 |

*Possible explanators of change, 1986-91*

There is no ready explanation for changes in ISA between 1986 and 1991. As each of the three socioeconomic variables chosen here (education, employment and income) contribute to the calculation of the ISA, each individual indicator can be correlated to the summary ISA. The Pearson correlation coefficient in all cases is positive. There is a very high correlation between individual variables and the summary index of which they form a part: the correlation coefficients for education, employment

and income to ISA in 1986 were 0.81, 0.88 and 0.83 respectively; in 1991 they were 0.89, 0.68 and 0.90 respectively.

An important hypothesis that can be partially tested is whether expansion of the CDEP scheme between 1986 and 1991 significantly influenced ISA change in the intercensal period. Information in Table 4 shows numbers of CDEP scheme participants by regional council in 1986 and 1991. Participant numbers grew from 4,982 in 1986 to 18,473 in 1991. The change in CDEP scheme participation by region can be correlated both with change in employment/population ratio and change in ISA scores. The former correlation coefficient is 0.87 and the latter is 0.30. This suggests that up to 30 per cent of change in ISA might be explained by growth in CDEP scheme participation pushing up the employment/population ratio. When individual regional councils are examined it is clear that rapid expansion of CDEP scheme participation can have an impact on the ISA score. For example, the two regions with the fastest intercensal growth in CDEP scheme participation (Peninsula with 2,629 and Derby with 1,159) were better off in terms of both ISA score and RAS category. In other regions, such as Garak-Jarru, fast growth in CDEP scheme participation has not been sufficient to shift the region from one RAS category to another. There is a definite tendency for regions with negative intercensal change in ISA to either not be CDEP scheme participants or else to have experienced limited growth in participation. Even where CDEP scheme growth has resulted in no, or limited, ISA change, it must be recognised that this has occurred in a deteriorating labour market; the CDEP scheme may have played a major role as a countercyclical labour market intervention (see Taylor 1993a, 1993b).

## Some policy issues

Given potential pitfalls in the use of census-derived statistics, any policy issues emanating from this analysis must, at best, be regarded as somewhat speculative. But the questions that the analysis raises are quite significant. If government policy aims to ameliorate indigenous socioeconomic disadvantage, then should the greatest effort be concentrated on those regions that are very evidently the worst off according to normative criteria? If not, perhaps because social indicators are deemed to be inappropriate in some contexts or because relative need (between indigenous and non-indigenous Australians) is deemed to be of equal importance to absolute need, then should ATSIC use socioeconomic assessments in allocative decision-making? It is important to emphasise that even the most advantaged regions in this analysis of relative wellbeing are only approaching the norm for non-indigenous Australians (see Taylor 1994; Taylor and Roach 1994a, 1994b).[12]

ATSIC regional councils have a number of statutory functions including planning, political representation, policy formulation and, increasingly, allocation of program dollars. The analysis here has descriptively assessed, using the only statistical database available, regional variations in the socioeconomic status of the indigenous population. However, it is important to re-emphasise that this analysis has not examined funding dollar supply-side factors, which is identified below as an issue for further research. To take just one example, the massive improvement in employment/population ratios during a recession, in regions such as Peninsula (24 per cent), Derby (18 per cent), Garak-Jarru (15 per cent), TSRA (12.5 per cent), Murdi Paaki (10 per cent), Nulla Wimila Kutju (11 per cent) and Papunya (12 per cent) (see Table 3) are associated with rapid expansion in CDEP scheme participation (see Table 4).

Furthermore, the indicators used here do not take into account cost disabilities, both in terms of service and program delivery and in terms of household expenditure. This is in part an inherent shortcoming of the ATSIC regional structure: the geographical size of regions varies to a far greater extent than populations (even population, however, varies by a factor of 14, see Table 2). But it is nevertheless an issue with immense potential policy significance. For example, given that the relatively most disadvantaged regions are located in remote areas, it is possible that when cost disabilities are taken into account these regions are even worse off. Conversely, countering socioeconomic disadvantage like inadequate housing could be far more costly in metropolitan centres like Sydney or Melbourne than in rural towns (Jones 1994). This reinforces the need to qualify the exercise undertaken here with further planned research on the relative socioeconomic status of indigenous Australians compared to non-indigenous Australians.

A danger inherent in the use of census-derived social indicators and indexes of social advantage or disadvantage is that, in the absence of comprehensive administrative data sets, there will always be a temptation for program managers to use these data, despite their well-documented shortcomings, as a means to assess what works and what does not. We have tried to demonstrate here that it is extraordinarily difficult to assess which program has impacted on which variable; if such assessments are to be made at the regional level, then it is essential that primary data are generated at that level.

On a more positive note, an exercise such as the one undertaken here does provide broad support for policies with normative statistical goals, such as the AEDP (Bamblett 1994). However, it is clear that in making assessments analysis will need to qualify official statistics. This is very clear, for example, in relation to participation in the CDEP scheme. In the census, such participation should be defined as part-time employment; but if indigenous Australians remain on the scheme in the longer term one

could observe perverse correlations between 'employment' growth and income growth. It is also important to recognise that in strategic terms policy makers need to differentiate between short-term measures of program performance, like increased 'employment' from labour market programs like the CDEP scheme, and longer-term outcomes like improved education and increased mainstream employment that may not be evident for another two or three censuses.

Another pleasing aspect of this analysis is that it lends support to the view that five-yearly censuses are progressively improving their coverage of the indigenous population, within the limitations referred to above imposed by the culture-specific nature of census inquiry (Smith 1992). The data examined here came from the fourth and fifth censuses that have included a question asking for ethnic self-identification. While demographers have noted the growing reliability of population counts in the census (see Evans, Kahles and Bate 1993; Gray and Gaminiratne 1993), the high intercensal correlation between the three indicators examined here also suggest improved data collection.

## Further research

One of the broad issues that arises from this analysis is that there is a deficiency in access to appropriate statistical data to fulfil the three objectives outlined above of regional planning, systematic resource allocation and program evaluation. It would be remiss of us not to outline some areas for further research.

To begin, there is an inherent problem in the use of census statistics as a source of data to facilitate targeting of resources to the indigenous Australians in most need. The question in the census that allows identification of indigenous Australians focuses on racial origin (ancestry) rather than identity (ethnicity). Just how indigenous Australians interpret this question has not been researched by the ABS. It certainly remains unclear if indigenous Australians who self-identify in the census correlate with those who access ATSIC's (and other) special programs. The divergence between the total populations of regional councils has already been alluded to (see Table 2). These regional council populations can be contrasted, for example, with voter turnout at the 1993 ATSIC regional council elections. These varied, in percentage terms, from 9 per cent of estimated eligible voters derived from census figures in Sydney Regional Council to a high of over 80 per cent in Peninsula Regional Council. This is not the place to analyse voter turnout for ATSIC elections, or the reasons for regional variations: rather our intention is to demonstrate that there may be a marked difference between the nominal indigenous populations of regions and the effective population that might seek access to special programs. This is an issue that requires further research.

Similarly, it is unrealistic to expect policy and program evaluation to be conducted with census data collected on a five-yearly basis; there is an urgent need for intercensal collection of statistics about the socioeconomic status of indigenous Australians (Altman 1992). The recent inclusion of an identifier in the monthly Labour Force Survey once a year is a move in the right direction. It is also possible that output from the 1994 National Aboriginal and Torres Strait Islander Survey might provide an opportunity both to cross-check and update 1991 Census data. Unfortunately, the questions asked and the mode of collecting data vary between the census and the national survey.

We emphasised at the outset that outcomes data alone will not provide a ready means to assess program effectiveness; information will also be needed about resource inputs, from all sources, at the regional level. Collection of such information is a complex research task which ATSIC is attempting to facilitate with the development of guidelines for developing regional plans (ATSIC 1992), to assist in community-based planning (ATSIC 1993) and to assist in regional economic studies (ATSIC forthcoming). However, it remains unclear what incentive structures are in place to encourage regional councils to develop and publish transparent regional plans that reveal all sources of funding and associated outcomes, whether positive or negative. The statutory onus remains with regional councils to complete and publish regional plans, and exercises such as ours may assist in such 'bottom up' planning. However, given overarching Commonwealth government policy aiming at statistical equality between indigenous and other Australians, it remains unclear if planning should be couched in terms of indigenous socioeconomic status relative to other Australians (in each region) or relative to other indigenous Australians throughout Australia. The former option suggests that census data might be further analysed to contrast indigenous and non-indigenous wellbeing at the regional level. The latter option suggests that there is a great deal of additional information, such as extent of indigenous land and sea ownership, access to informal economic opportunities and access to randomly distributed commercial opportunity, that needs to be factored into any assessment of socioeconomic advantage or disadvantage.

Finally, it is important that policy makers consider the interrelationships between any particular variables chosen for analysis. The three chosen here reflect the current economic equality and social justice concerns of government; this focus in turn reflects an implicit acceptance of the human capital model. As our statistical analysis demonstrated, there is a great deal of interdependence (or multicollinearity) between education, employment and income. Here we have chosen to give equal weighting to these three variables, but for other purposes it might be preferable to give less weight to one variable over another. For example, given the identified positive impact of CDEP scheme participation on employment/population ratios, it might be advisable to differentiate part-time from full-time employment.

Such issues lead to the realm of assessing relative program effectiveness, often at inter-agency or intergovernmental levels, which is not the primary goal of this analysis.

## Conclusion

This paper has provided census-based information on three important variables that measure socioeconomic status: education, employment and income. These three variables have been combined into a single Index of ISA for 1986 and 1991 and an attempt has been made to differentiate regions that have demonstrated socioeconomic status change in the intercensal period. A key determinant of change, especially in employment status, has been rapid expansion of the CDEP scheme: in some regions the scheme has resulted in significant change in socioeconomic status as defined by official social indicators. In other regions, expansion of CDEP scheme participation has probably markedly ameliorated the full impact of the recession.

The aim of our analysis has been primarily to demonstrate to regional councils how census data might be used to situate each ATSIC region in relation to others. We have emphasised that our analysis is exploratory rather than definitive and we have generated numerous additional tables (described in Appendix 1) that might be of use to regional councils for planning purposes. Ultimately though, we remain sceptical that official statistics provide an appropriate profile of socioeconomic status at the regional level. ATSIC regional councils, however, like social science researchers, face a Hobson's choice: available official statistics have to be used for comparative purposes because no other overarching database is available. The option of generating primary data at the regional level certainly needs to be explored, but this will not assist comparative analysis. Consideration must be given to exploring means to generate more meaningful data about indigenous Australians especially for program evaluation purposes. A useful starting point is the proposal to identify CDEP scheme participation by industry sectors in the 1996 Census; this might provide a mechanism that will allow derivation of employment data that identifies participants in the CDEP scheme from other employed people.

ATSIC is quite legitimately seeking a systematic means to allocate scarce program dollars on some broadly accepted measure of need. Whether need should be defined in relative or absolute terms remains a contested issue. What is clear is that however need is measured, any rational resource allocation will also need information on global allocation of resources from all levels of government, at the regional level. Unless ATSIC can gather all such data, it will be impossible to develop a centralist formula-driven model for dividing ATSIC resources between 36 regional councils. An

alternative that is currently being considered is for allocations to be made on a functional program basis, but the danger with this approach is that it can compartmentalise functional areas rather than recognising interdependence.

Another alternative is to increasingly place the onus on regional councils to demonstrate their specific needs, including cost disabilities associated, for example, with locational disadvantage or small scale. Such an approach has analogies with the fiscal federalism practised by the Commonwealth, States and Territories and mediated by the Commonwealth Grants Commission. Interestingly, there is a strong current view that the federal model has not served the best interests of indigenous Australians because resource allocation at the intra-State and intra-Territory level has not been equitable. There remains legitimate concern that ATSIC regional councils may receive an equitable share of the total funding cake, but that at the intra-regional level resources may not be disbursed on a systematic needs basis. Such issues of fiscal equalisation are beyond the immediate concerns of our analysis here; they are merely indicative of the enormous complexity of the political economy of resource allocation in indigenous affairs that can perhaps be informed, but certainly not resolved, by analysis of official statistics.

**Notes**

1. The ATSIC jurisdictions compare 35 ATSIC regional councils and the newly established Torres Strait Regional Authority (TSRA). For ease of exposition we refer to 36 regional councils throughout this paper.

2. This dependence on the census will change when output from the 1994 National Aboriginal and Torres Strait Islander Survey is available early in 1995.

3. Jones (1994) has used 1991 Census data disaggregated to the ATSIC regional level to assess the relative housing need of indigenous Australians according to normative criteria like crowding and affordability. ATSIC has not yet indicated whether it will allocate housing grants based on this quantitative assessment.

4. Tesfaghiorghis (1991a) did not publish his exact ISA scores, but he has made these available to us. They are presented in Appendix 2.

5. Note that such reconstruction is not usual and has been a feature of the regional jurisdictions analysed by Tesfaghiorghis (1991a), Altman and Gaminiratne (1992) and Khalidi (1992).

6. The ABS does produce a number of socioeconomic indexes for areas (SEIFAs) at the census collection district (CD) level, but these do not contain an ethnic identifier (ABS 1993). Gray and Tesfaghiorghis (1991) used 1986 Census data to clearly demonstrate a statistical relationship between CDs with a high indigenous Australian population proportion and socioeconomic disadvantage. As the ABS (1993: 14) warns that SEIFAs from the 1986 Census cannot be compared for those in 1991, these data are of limited use in monitoring change over time.

7. The issue of how effectively official statistics capture diversity was, in large part, the subject of a workshop conducted in 1992 (see Altman 1992). Smith (1992), in particular, focused on the cultural appropriateness of official statistics.

8. SD is the most useful and widely used measure of dispersion. The SD's advantage is that it uses all of the data; it varies with the amount of dispersion. The coefficient of variation is the SD expressed as a percentage of the mean. One use of the coefficient of variation is in comparing the relative variability of two distributions which are not expressed in the same units (note however, that the coefficients of variation can also be used to compare the relative variability of distributions expressed in the same units).

9. Spearman's Rank Correlation Coefficient can be used to test the null hypothesis of no association between a pair of random variables. Suppose that we have a random sample $(x_1,y_1),...,(x_n,y_n)$ of n pairs of observations. If the $x_i$ and $y_i$ are each ranked in ascending order and the sample correlation of these ranks is calculated, the resulting coefficient is called Spearman's Rank Correlation Coefficient. If there are no tied ranks, an equivalent formula for computing this coefficient is as follows:

$$r_s = 1 - \frac{6\sum_{1}^{n} d_i^2}{n(n^2-1)}$$

where the $d_i$ are the differences of the ranked pairs.

10. The formula for calculating the ISA is as follows:

$$ISA = 3 \sum_{i=1;j=1}^{36;3} \frac{x_{ij} - \bar{x}_j}{sd_j};$$

ISA is Index of Socioeconomic Advantage for 1986 and 1991; $x_{ij}$ is data in region i with variable j; $\bar{x}_j$ is mean of variable j; $sd_j$ is standard deviation of variable j; i = 1, 2, 3, ... 36 and j = employment/population ratio, per cent qualified and median income.

11. In this case, 96 per cent of the total indigenous population is Torres Strait Islander, see Arthur (1994). Note that in Figures 1 to 3, shading for the TSRA is provided behind the box.

12. As noted earlier further research with the working title 'Comparing indigenous and non-indigenous socioeconomic status at the ATSIC regional level, 1991' is under way at CAEPR.

## Appendix 1

### Other socioeconomic indicators available at the ATSIC regional council level for 1986 and 1991.

In preparing this paper, 25 variables were tabulated for the 36 ATSIC regional councils in 1986 and 1991. Only four of these variables have been used here in Tables 2 and 3, with 21 initial variables being dropped primarily because they did not facilitate unambiguous and/or culturally appropriate measures of socioeconomic advantage. Other tables are not reproduced here, but might be of use to individual regional councils for planning purposes. The 25 variables have been grouped into four categories as described below. Regional councils wanting access to these data should contact Mr Geoff Dane, Statistics Section, ATSIC, PO Box 17, Woden ACT 2606.

*A. Demographic structure and its economic consequences*

(1) population size (see Table 2);

(2) childhood dependency ratio which is defined as the ratio of the number of children (under the age of 15 years) to the number of the working-age population (aged 15-64 years) times 100;

(3) childhood burden which is defined as the ratio of the number of children (aged 0-14 years) to the number of employed persons (aged 15 years and over) times 100;

(4) dependency ratio which is the ratio of children (aged 0-14 years) and economically inactive persons (population 65 years and more) to the economically active persons (aged 15-64 years);

(5) child/woman ratio which is the ratio of children (aged 0-4 years) to women (aged 15-49 years);

(6) economic burden which is defined as the ratio of children and economically inactive persons to employed persons (aged 15-64 years) times 100.

*B. Employment indicators*

(7) employment/population ratio which is the ratio of the total number of employed persons (aged 15-64 years) to the population (aged 15-64 years) (see Table 3);

(8) non-employment/population ratio which is defined as 1 minus the employment/population ratio;

(9) labour force participation rates which the ratio of the labour force (aged 15-64 years) to the population (aged 15-64 years);

(10) proportion of dependent workers which is the ratio of employees who receive wage incomes for their services to total employed persons (15 years and over) times 100, and proportion of independent workers which is the ratio of self-employed proprietors whose incomes are given by the profits of their enterprises administration to total employed persons (15 years and over) times 100;

(11) proportion of persons working in the private industry sector which is defined as the ratio of persons working in the private sector to total employed persons (15 years and over, excluding not stated) times 100;

(12) proportion of persons working in non-private sector (Commonwealth, State/Territory and local governments) which is defined as 100 minus the proportion of persons working in the private industry sector;

(13) proportion of persons working in production industry (agriculture, forestry, fisheries and hunting; mining; electricity, gas and water; construction) which is defined as the ratio of persons working in the production industry to total employed persons (15 years and over, excluding not stated and not classified) times 100;

(14) proportion of persons working in the service industry (wholesale and retail trade; transport and storage; communication; finance, property and baseness services; public administration and defence; community services; recreation, personal and other services) which is defined as 100 minus the proportion of persons working in the production industry.

*C. Income and education indicators*

(15) annual individual gross median income (see Table 3);

(16) proportion of persons with individual income less than or equal to $5,000 which is the ratio of persons with individual income less than or equal to $5,000 to total persons (excluding not stated) times 100;

(17) proportion of persons with no qualifications which is the ratio of not qualified persons to total persons with qualification level at age 15 year and over (excluding not stated);

(18) proportion of persons with qualifications which is 1 minus the proportion of person with no qualifications (see Table 3);

(19) proportion of persons who left school at age less than 15 years which is the ratio of persons who left school under 15 years of age to total age left school (excluding not stated) times 100;

(20) proportion of persons who never attended school which is the ratio of persons never attending school to total persons with type of education attending (including not stated) which is equivalent to total population;

(21) proportion of persons who did not go to school which is the ratio of persons who did not go to school 15 years and over to total age left school (excluding not stated) times 100.

*D. Housing indicators*

(22) home ownership rate which is defined as the ratio of persons who own or are purchasing a dwelling, including caravans etc in caravan parks and other occupied private dwellings to total dwellings (including not stated);

(23) non home-ownership which is defined as 1 minus home ownership;

(24) dwelling occupancy rates which is the average number of persons occupying a private dwelling (total population/total private dwelling expressed as ratios);

(25) median weekly rent.

## Appendix 2

**Table A2.1. Indigenous socioeconomic status estimated by 'the Tesfaghiorghis index'.**

| Region | ISA | RAS | Region | ISA | RAS |
|---|---|---|---|---|---|
| Sydney | 14.0 | 1 | Papunya | 5.0 | 4 |
| Wangkumara | 7.4 | 4 | Warburton | 6.3 | 4 |
| Deniliquin | 8.4 | 3 | Yulara | 6.6 | 4 |
| Wirawongam | 8.8 | 3 | Kaurna | 11.2 | 2 |
| Gomilaroi | 7.4 | 4 | Pt Augusta & area | 8.5 | 3 |
| Murrumbidgee | 9.4 | 3 | Murrundi | 9.6 | 3 |
| NSW - Far West | 6.6 | 4 | Wanga Pulka | 8.4 | 3 |
| Northern Rivers | 8.3 | 3 | Karkarnyiny | 9.3 | 3 |
| Bogong | 19.2 | 1 | Kutjungka | 8.4 | 3 |
| Umbara | 9.0 | 3 | Fitzroy Crossing | 4.8 | 4 |
| Quirindi | 9.4 | 3 | Yarleyel | 8.8 | 3 |
| Taree | 9.8 | 3 | Western Desert | 8.6 | 3 |
| Tingha | 7.9 | 4 | Wunan | 7.7 | 4 |
| Bairnsdale | 11.0 | 2 | Kularri | 10.2 | 3 |
| Halls Gap | 12.3 | 2 | Ngarda Nguli | 8.5 | 3 |
| Melbourne | 15.6 | 1 | Jayida Buru | 11.8 | 2 |
| Brisbane | 11.7 | 2 | Yamatji | 8.3 | 3 |
| Peninsula | 8.9 | 3 | Wongi | 6.9 | 4 |
| Gulf | 11.1 | 2 | Kaatanyiny | 7.5 | 4 |
| Woorabinda/Cherbourg | 8.2 | 3 | Wyalcatchem | 7.5 | 4 |
| Palm Island/Yarrabah | 6.3 | 4 | Launceston | 14.1 | 1 |
| Cairns and district | 8.1 | 3 | Daly River | 5.6 | 4 |
| Townsville | 9.9 | 3 | Yilli/Rreung | 12.4 | 2 |
| Gulburri | 9.2 | 3 | Tiwi Islands | 7.9 | 4 |
| Mount Isa | 11.1 | 2 | Jabiru | 6.4 | 4 |
| Rockhampton | 10.0 | 3 | Victoria River | 7.6 | 4 |
| Thursday Island | 9.5 | 3 | Mataranka | 7.8 | 4 |
| Alice Springs | 8.9 | 3 | Yapakurlangu | 7.6 | 4 |
| Deakin | 10.1 | 3 | Miwatj | 6.7 | 4 |
| Harts Range | 5.5 | 4 | | | |
| Indulkana | 8.9 | 3 | | | |

High = 14 - 19 - 1
Moderately high = 11 - 13.9 - 2
Average = 8 - 10.9 - 3
Low = 5 - 7.9 - 4

Tesfaghiorghis used 1986 Census data applied to 1991 ATSIC regional boundaries. To broadly correlate these 60 regions with the current 36 ATSIC regions, it might be necessary to refer to Tesfaghiorghis's map (Tesfaghiorghis 1991a: 9). Most current regions are amalgamations of the regions shown on that map, although names have changed, but there have been some boundary changes from 1993.

Source: H. Tesfaghiorghis (pers. comm.).

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