# The Indigenous population of Cape York Peninsula, 2001–2016

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## Abbreviations and acronyms

| | |
|---|---|
| ABS | Australian Bureau of Statistics |
| AGPS | Australian Government Publishing Service |
| AIGC | Australian Indigenous Geographic Classification |
| ANU | The Australian National University |
| ASFR | Age-Specific Fertility Rate |
| ASGC | Australian Standard Geographic Classification |
| ATSIC | Aboriginal and Torres Strait Islander Commission |
| CAEPR | Centre for Aboriginal Economic Policy Research |
| CD | Collection District |
| CDEP | Community Development Employment Program |
| CHINS | Community Housing and Infrastructure Needs Survey |
| CYPLUS | Cape York Peninsula Land Use Strategy |
| ERP | Estimated Resident Population |
| IA | Indigenous Area |
| NARU | North Australia Research Unit |
| OESR | Office of Economic and Statistical Research |
| QCPR | Queensland Centre for Population Research |
| SLA | Statistical Local Area |
| TFR | Total Fertility Rate |
| WPHC | Well Person's Health Check |

## Summary

Recent projections made by the Australian Bureau Statistics (ABS) of Indigenous populations resident in various regions of north Australia included a set of estimates for Cape York Peninsula. These were found to be substantially at odds with the results for adjacent regions such as the West Arnhem and Gulf regions of the Northern Territory. In particular, the Cape York projections produced population growth rates that were substantially lower than those recorded for other regions, with projected numbers in certain age groups actually declining over the forecast period to 2016. Two factors were regarded as responsible for this outcome:

- a deficient 1996 estimated resident population (ERP), and
- a lack of regionally-derived age-specific fertility rates (ASFRs).

This paper seeks to redress these shortcomings by presenting an alternative and improved set of 1996 population estimates, and by applying regionally-derived ASFRs to projections from this base year.

### Exploring alternative sources of population data

The basic strategy employed in constructing alternative population estimates to those available from the ABS, was to identify other regional population counts that had some claim to credibility in terms of their coverage of the Indigenous population within the region at specified points in time. A number of such sources were identified, and each was assessed for suitability as an element in a proxy count.

The unit of analysis is that described by the boundaries of the Peninsula ATSIC Region. This area encompasses 13 discrete Indigenous communities, as well as smaller localities scattered across the balance of the region. ABS population estimates are the only data available within this region that encompass all age groups across all communities. While a range of other population data are collected as a by-product of various administrative systems, these only yield population numbers for selected age-groups and do not always cover all communities. Thus, any attempt to construct an alternative set of population estimates must perforce be based on a composite estimate, combining data from various sources. In this study these included:

- school enrolment statistics from Queensland Education;
- administrative databases of health services as constructed by Queensland Health's Well Person's Health Check (WPHC);
- ABS data on registered births by age of mother via the Registrar-General; and
- data on births by age of mother from the Midwives' Collection assembled by Queensland Health.

The use of demographic data from Centrelink payments records was explored but rejected.

A composite methodology applying each of these data sources to different age components of the census count delivers an estimate of the Indigenous population of the Peninsula ATSIC Region in 1996 of 6,504 persons. This is 869 persons (15.4%) higher than the 1996 Census Count of 5,635, and 320 persons (5.2%) higher than the 1996 estimated resident population of 6,184.

## Projecting the Indigenous population in Cape York Peninsula to 2016

A cohort-component method was used to carry forward the composite estimate for 1996 by successive five-year periods to 2016. The procedure ages the population by five-year blocs, subjecting each group to assumptions about age- and sex-specific mortality, fertility and net migration regimes. Overall, the population is projected to increase by 2,150, representing an increase of 33 per cent, or 1.65 per cent per annum.

According to these estimates, in 1996, almost 60 per cent of the resident population of the Peninsula ATSIC Region was Indigenous. By 2016, this is projected to rise to 64 per cent. Given this rising Indigenous share of total population, the implication is for a decline in the number of non-Indigenous residents, albeit only slight, commencing in 2001. Such a trend is not inconceivable given that it has been seen at the aggregate level across remote Australia since 1986.

The effects of sustained high fertility, population momentum and overall ageing are clearly visible. Population momentum refers to the movement of larger, or smaller, cohorts up the age structure, replacing their smaller (or larger) predecessors. The largest numeric increase is evident among school-age children and youth in the transition years to work and family formation (5–14 and 15–24). However, the greatest proportional increase is found among those of older working age (45–64), with this group almost doubling in size by 2016 due to ageing of cohorts that were in the 20–39 years age-range in the mid-1990s.

It is important to note that the composite estimates presented here do not seek to modify or build upon existing ABS ERPs; they simply provide an alternative set of figures that are based on a different methodology and draw on a variety of data sources, including the census count. By applying local proxy demographic data, we have demonstrated that alternative approaches to estimation are available and achievable. While further refinement of techniques is required, and while data sources warrant more validation, there is sufficient in the analysis and results presented here to conclude that the 1996 ABS Indigenous ERP for Cape York Peninsula is deficient, both in terms of overall numbers and for specific age groups.

The policy implications of these revised estimates are wide-ranging.

- They raise the prospect, for regional and State authorities, of developing population estimates and projections in addition to those available from the ABS.

- Adoption of these alternative estimates would impact on the calculation of rate and ratio measures, as the larger denominator would reduce those derived from consistent numerators.
- Existing social and economic pressures affecting different age groups in the population (children, youth, and adults both young and old) can only intensify, all other things being equal, as the larger estimated birth cohorts advance through the age profile.
- The greatest future growth is in older working-age groups. The cohorts which will enter this part of the age structure by 2016 are characterised by limited workforce experience and a high level of welfare dependency. The size of these cohorts raises the stakes in regard to capacity-building for regional social and economic development.

## Acknowledgments

A substantive version of this paper first appeared in the Queensland Centre for Population Research (QCPR) Discussion Paper series. The QPCR paper was prepared in response to a request from the Office of Economic and Statistical Research (OESR) of Queensland Treasury in the context of the Cape York Justice Study commissioned by the Queensland Government and conducted under the Chairmanship of Mr Tony Fitzgerald. The present extended analysis builds upon this earlier research and was supported by Rio Tinto as part of its planning for engagement with Indigenous communities in Cape York.

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## Introduction

In July 2001, a report on projections of Indigenous populations resident within the hinterlands of Rio Tinto mining operations across northern Australia included a set of estimates for Cape York Peninsula. These were found to be substantially at odds with the results for other northern regions, especially when compared with those adjacent such as the West Arnhem and Gulf regions of the Northern Territory (Taylor & Bell 2001a). In particular, the Cape York projections produced population growth rates that were substantially lower than those recorded for other regions, with projected numbers in certain age groups actually declining over the forecast period to 2016. Two factors were regarded as responsible for this outcome: a deficient 1996 estimated resident population (ERP), and a lack of regionally-derived age-specific fertility rates (ASFRs). This paper seeks to redress these shortcomings by presenting an alternate and arguably improved set of 1996 population estimates, and by applying regionally-derived ASFRs to projections from this base year.

Fundamental uncertainties are inherent in Aboriginal and Torres Strait Islander population counts. This is because counts of Indigenous Australians are the product of an interplay between political, administrative and cultural processes—in particular, the variable manner in which the Queensland and Commonwealth governments have attempted over time to enumerate and categorise Indigenous people, and the choices made by possible respondents to such overtures. The fact is, stable Indigenous enumeration in census and administrative collections has not yet been achieved, with the result that discrepancies exist between census-based population estimates and those acquired as a by-product of administrative processes.

The difficulty that this presents for demographic measurement is highlighted in the context of benchmarking social policy outcomes. As Cunningham (1998) has noted, governments at all levels are increasingly keen to develop performance indicators to evaluate the success or otherwise of policy. Given that many such indicators are rate or ratio measures, questions arise regarding the capacity to make such assessments when the denominators used to measure change in social indicators can vary so much between census counts, and where these counts may differ in unknown ways from numerator data drawn from other sources, notably from administrative collections (Taylor 1997). Uncertainty regarding the concordance between populations in both numerators and denominators, and the extent to which these move together over time, presents particular difficulties for the assessment of trends (Cunningham 1998).

## Population counts in Cape York Peninsula

Since the 1991 Census, special census field procedures have been applied in Queensland by the Australian Bureau of Statistics (ABS) in an attempt to improve the enumeration of Indigenous people in remote communities, albeit within budgetary constraints. As in other States and the Northern Territory, the

overriding feature of this strategy has been the use of locally-recruited Indigenous interviewers and the development of a two-stage enumeration involving household listings and shortened personal forms (Taylor 1993). Since communities and governments rely heavily for planning purposes on the demographic data generated by this process, the outcomes tend to be closely scrutinised, and it is true to say that the census is perceived by many to yield an underestimate of Indigenous population numbers. This is despite the fact that the ABS has at times declared an overcount of Indigenous people in remote areas (ABS 1993: 6).

One forceful claim of undercounting emerged in the Cape York Peninsula Land Use Strategy (CYPLUS) (King 1994). However, it is often the case that when such claims are dissected they prove to be based more on guesswork than on rigorous analysis. Thus, the CYPLUS assertion derived from an invalid comparison between de facto 1991 ABS Census counts of the Cape York population and estimates of a 1994 de jure population drawn from a variety of key informants in Cape York communities. Even more discouraging was the author's own assessment that alternate population levels were established from deductive guesswork based on questionable assumptions (King 1994: 27–8). Approaches such as this, while asserting under-enumeration, provide no statistical basis for testing the proposition and serve only to obfuscate.

Surprisingly, there is only one published instance of a case where rigorous testing of the accuracy of a census count was possible. This involved an ethnographically-based enumeration of Indigenous people in Aurukun that was concurrent with the 1986 Census count (Martin & Taylor 1996). Comparison of the resulting counts found that the census fell short of the alternate enumeration by 17 per cent, or 145 persons, with most of those omitted being drawn from the population under 30 years of age. Similar discrepancies in the Aurukun count were estimated for the 1991 Census, with one reason being a failure to enumerate Aurukun outstations. However, a more structural basis for undercounting was uncovered, involving the routine omission of young people, the more mobile and the more socially marginal. This was considered to be a by-product of the ABS methodology for remote area enumeration, in particular its attempt to assign individuals to households conceived in terms of mainstream constructs (Martin & Taylor 1996).

Given the uniformity of approach to census-taking in Cape York communities, there appears to be some basis for asserting that discrepancies of similar magnitude may exist across the region. Indeed, the relative exclusion of similar cohorts from official census counts is something that has long been noted by analysts (Gray & Tesfaghiorghis 1993: 84), and is openly acknowledged by the ABS (ABS 1993: 16–17, 1998: 28–9). Likewise, substantially divergent regional trends in Indigenous population change have been observed in many remote regions of north Australia, over both the 1986–91 and the 1991–96 intercensal periods. These are difficult to explain solely by reference to demographic processes (Taylor 1993: 5, 1997).

Of course, the ABS seeks to adjust for such error when constructing post-censal ERP figures by sex and five-year age-group at the Statistical Local Area (SLA) level. Following the 1996 Census, Indigenous ERPs were produced for the first time using the following adjustments to census 'usual residence' counts for each SLA:

- pro rata distribution of non-responses to the census question on Aboriginal or Torres Strait Islander origin;
- correction for net undercount of the population by applying an age, sex-specific undercount distribution for the total Australian population to the total Indigenous undercount rate of 7.1 per cent;
- adjustment to account for the difference between census numbers of individuals aged less than 5 years and registered births for the intercensal period 1991–96 (ABS 1998: 27–9).

While this estimation procedure no doubt enhances reliability, it does not allow for possible regional variation in undercount. Furthermore, an Indigenous identifier in birth registration only appeared in Queensland at the end of the intercensal period, in 1996, so it is unclear precisely how the third of the above steps was conducted for Queensland SLAs. In any case, no time series of Indigenous ERPs exists as yet from which intercensal growth rates might be assessed. It is also relevant that Indigenous ERPs are referred to by the ABS as 'experimental' owing to the uncertain quality of data on births, deaths and internal migration, and limited capacity exists as yet for assessing their accuracy (Howe 1999).

The bottom line is that difficulties persist in the accurate enumeration of remote Indigenous populations. While the ABS officially acknowledges that enumeration procedures failed in particular localities in 1996 (Ross 1999: 62–4), none of those identified as problematic were located in Cape York Peninsula. Despite this, the Peninsula ATSIC Region was the only such region in Australia to record a decline in population count (from 5,724 to 5,635, or 1.5%) between 1991 and 1996, and many communities within this region recorded percentage reductions that were much greater (Table 1).

Such widespread decline in population appears dubious on two counts. First, it runs counter to the trend of the previous intercensal period which indicated an increase in population of 21 per cent. Second, because of the age structure of the population and the high fertility rate, the apparent population decline should be due to sizeable net migration loss, and yet analysis of inter-regional flow data point to net migration balance as a characteristic feature of this region (Taylor & Bell 1996).

Against this background, program administrators, planners, and those negotiating for improved outcomes for Indigenous residents of Cape York Peninsula struggle to best represent the situation on the ground, not least

because there are alternative and conflicting population estimates from a variety of administrative sources and from the Community Housing and Infrastructure Needs Survey (CHINS). At the political level, it matters not that various counts and estimates might be incompatible; what matters more is perceptions. Accordingly, there are demands for an assessment of official ABS population estimates and an exploration of possible options for adjusting these. Much of the concern arises in the context of needs assessment, both globally and between places. However, there is also the problem of establishing meaningful trends in social indicators over time, although, somewhat perversely, adjustment to the population base in this context almost invariably leads to a reduction in social indicator rates.

**Table 1. Indigenous community census population counts: Peninsula ATSIC Region, 1991 and 1996**

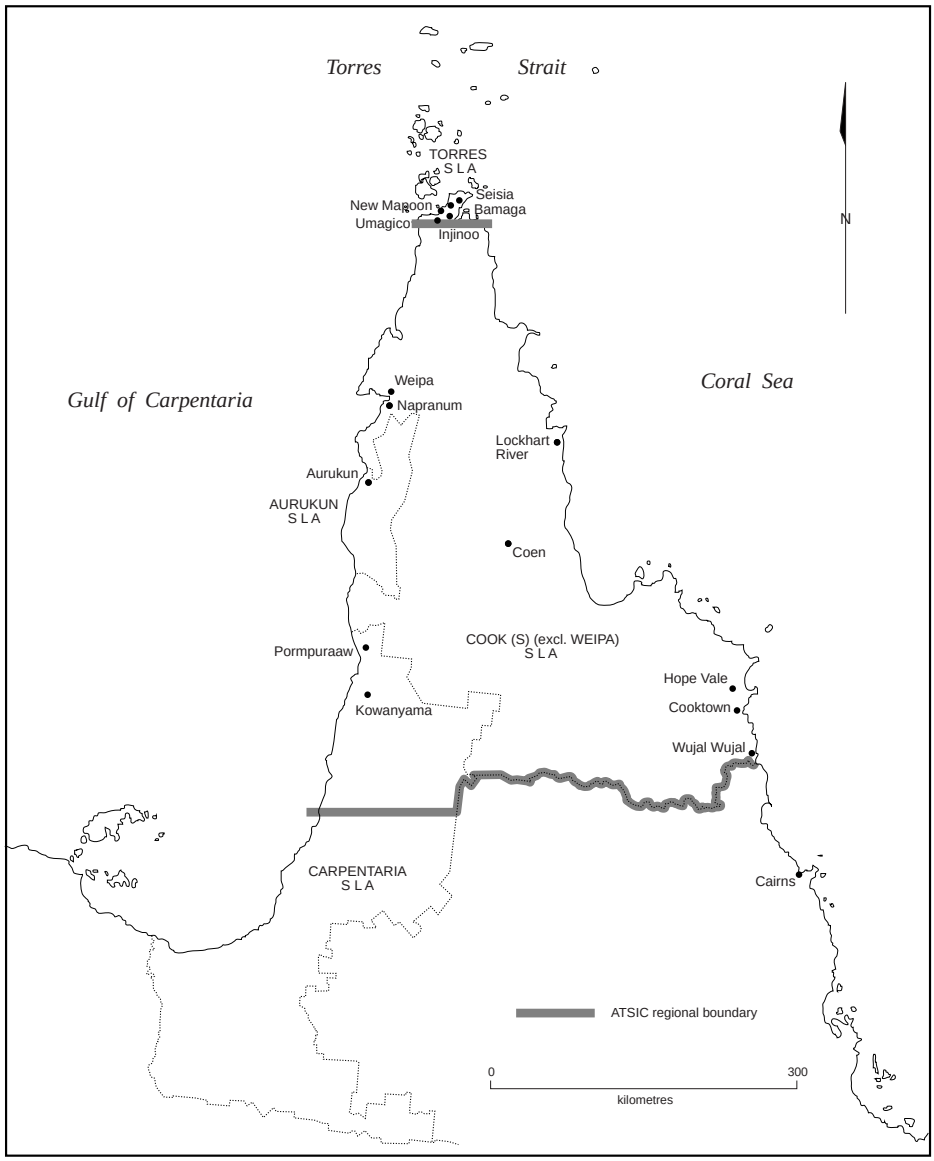
| | Population | | Population change | |
|---|---|---|---|---|
| Community | 1991 | 1996 | No. | % |
| Kowanyama | 935 | 821 | -114 | -12.2 |
| Pormpuraaw | 438 | 475 | 36 | 8.2 |
| Aurukun | 701 | 691 | -10 | -1.4 |
| Napranum | 653 | 722 | 69 | 10.6 |
| Injinoo | 312 | 320 | 8 | 2.6 |
| Umajico | 187 | 202 | 15 | 8.0 |
| New Mapoon | 224 | 258 | 34 | 15.2 |
| Coen | 117 | 112 | -5 | -4.2 |
| Lockhart River | 476 | 461 | -15 | -3.1 |
| Hopevale | 772 | 671 | -101 | -13.1 |
| Wujal Wujal | 269 | 280 | 11 | 4.1 |
| Cooktown | 100 | 169 | 69 | 69.0 |
| Weipa | 225 | 162 | -63 | -28.0 |
| Balance | 315 | 291 | -24 | -7.6 |
| Total | 5,724 | 5,635 | -89 | -1.5 |

Source: ABS Censuses, 1991 and 1996.

## Exploring alternative sources of population data

The basic strategy employed in constructing alternative population estimates to those available from the ABS, was to identify other regional population counts that had some claim to credibility in terms of their coverage of the Indigenous population at specified points in time. A number of such sources were identified, including school enrolment statistics, health clinic registers' perinatal and registered births data, and Centrelink payments data. Each of these was assessed for suitability as an element in a proxy count.

**Fig. 1. The Peninsula ATSIC Region in relation to ABS statistical geography**




Source: ABS 1996a: 152.

An essential first step in this process is to define the statistical unit(s) of interest. There are various options, based on different combinations of spatial units from the Australian Standard Geographic Classification (ASGC) and the Australian Indigenous Geographic Classification (AIGC), including Collection Districts (CDs), Indigenous Areas (IAs), SLAs and ATSIC Regions. The main issues for

consideration include whether certain northern Peninsula communities are more appropriately assigned to the Torres Strait, how far down the Gulf of Carpentaria the Cape region is deemed to extend, and likewise along the Pacific coast towards Cairns. Fortunately, as the primary service delivery unit with some claim to status as a culture area (Martin 1997: 1–2), the boundaries described by the Peninsula ATSIC Region (Fig. 1) resolve all of these questions, and this is the unit of analysis adopted here. The Region includes the SLAs of Cook, Weipa, and Aurukun, and that part of Carpentaria SLA that incorporates Pormpuraaw and Kowanyama, but excludes the northern Peninsula communities of Bamaga and Seisia which lie within the Torres SLA. This region, then, encompasses 13 discrete Indigenous communities, as well as smaller localities scattered across the balance of the region, as detailed in Table 1.

It is important to note that ABS population estimates are the only data available within this region that encompass all age groups across all communities. While a range of other population data are collected as a by-product of various administrative systems, including those already listed, these only yield population numbers for selected age groups and do not always cover all communities. Thus, any attempt to verify ABS estimates must perforce be based on a composite estimate, combining data from various sources.

## School enrolment statistics

Each community in Cape York Peninsula has a public school, and school enrolment data as at July each year are available indicating the age, sex and Indigenous status of students. While these data refer to all enrolments of school-age children, their coverage is most complete for the population of primary school age (6–11 years). Indigenous enrolment in Cape York schools tends to taper off in secondary years, while enrolments under age 6 are affected by Queensland's rules on minimum age at school entry.

These data must be treated with caution because of their coverage. Bamaga school in northern Cape York Peninsula caters for children from the Bamaga and Seisia communities (which lie outside the Peninsula ATSIC Region), as well as from Umagico, Injinoo and New Mapoon (which are located within the Region). While proportions in these two population groupings can be readily estimated from census data, less tractable is the issue of Indigenous children attending private schools outside the Region, since these are obviously excluded from the census of Peninsula ATSIC Region schools. While the numbers involved at ages 6–11 are probably low, it would be helpful to validate this from information on the usual residence of boarders at schools in towns such as Charters Towers, Cairns, and elsewhere in Queensland.

## Health clinic registers

Another source of population data is the administrative databases of health services. In theory, patient records (which include demographic information) are available for the whole population, on the assumption that everyone accesses

health services. However, before these records are used for demographic analysis, careful sifting is required to avoid double-counting across overlapping clinic catchment areas, and to account for additions and deletions due to births, deaths and net migration in each area. One means of deriving a population from such records, that has been successfully applied in Indigenous communities elsewhere (Taylor 2001; Taylor, Bern & Senior 2000), is to download demographic data for those who indicate a relevant community as their usual residence, and then to revise and update the resulting lists using the local knowledge of health workers and other key informants.

Such an exercise formed a vital part of Queensland Health's Well Person's Health Check (WPHC). This is a community-based screening program offered to Indigenous teenagers and adults, and is a collaborative initiative between Apunipima Cape York Health Council, Queensland Health (Tropical Public Health Unit), and local community organisations. More than 3,000 Indigenous people over the age of 13 years from 26 communities across Queensland's Northern Health Zone participated in the WPHC between March 1998 and December 2000, and six of these participating communities (Pormpuraaw, Aurukun, Napranum, Umagico, Injinoo and New Mapoon), were located in the Peninsula ATSIC Region. Thus, age and sex data for the population aged 13 years and over are available from this source for these communities, and these can be aggregated to form a proxy demographic profile for the Peninsula ATSIC Region as a whole. The key unknown factor in this data set is the extent to which these six communities are representative of all communities in the region.

## Births data

One of the difficulties encountered to date in analysing intercensal Indigenous population change in Cape York Peninsula has been the lack of data on all Indigenous births, as it was not until 1996 that an Indigenous identifier was included on Queensland birth registration forms. However, regional births data now provide a valuable benchmark against which the age structure of the region, especially the size of the 0–4 age-group, may be compared. Two sources of births data are available for this purpose: one is derived from the ABS via the Registrar-General, and the other is the Midwives' Collection assembled by Queensland Health. Both sources have shortcomings, as Table 2 reveals.

**Table 2. Characteristics of Indigenous birth registration data and Indigenous midwives' (perinatal) data**

| Characteristic | Birth Registers | Midwives' Collection |
|---|---|---|
| Population covered | All Indigenous births | Births to Indigenous mothers only and excludes perinatal deaths |
| Timeliness | Subject to late registration | Up-to-date |
| Data availability | 1996 and 1997 | 1995 and later |
| Geographic coverage | SLAs | SLAs |

The key deficiency in the birth registers data is late registration. The ABS estimated that by 1998, 89 per cent of 1996 Indigenous births in Queensland had been registered, and 93 per cent of 1997 births (ABS 1998: 66). While perinatal data overcome this deficiency, their main shortcoming is that they omit births where the father is Indigenous but the mother is non-Indigenous, and they exclude infants who die during the first 28 days of life.

Empirical analysis reveals comparatively little difference between the fertility rates generated from these two sources (Table 3). The Total Fertility Rate (TFR) for the three SLAs of Cook, Weipa and Aurukun, according to the registration data averaged over 1996 and 1997, was 3.04, whereas the TFR for the four SLAs of Cook, Weipa, Aurukun and Carpentaria derived from perinatal data is calculated at 2.94 . It is notable that both figures are significantly above the Indigenous TFR for Queensland as a whole (2.16), but still somewhat below that of several Indigenous communities elsewhere in northern Australia where registration data are regarded as more reliable. For example, the TFR for Kakadu in 1996 was 3.66, for Port Hedland it was 3.5, and for the Gulf region of the Northern Territory it was 3.1 (Taylor & Bell 2001a). The Cooktown Region TFR of 3.04 derived from registered births was closest to these neighbouring rates, and so it was the one selected for use in re-creating the 0–4 year age group for the Peninsula ATSIC Region as a whole.

**Table 3. Cape York fertility according to birth registration and midwives' data, 1996–97**

| | Registration Data[a] | | | Midwives' Collection[b] | | |
|---|---|---|---|---|---|---|
| Age | Births | Population | ASFR/000[c] | Births | Population | ASFR/000[3] |
| under 19 | 22 | 150 | 146.7 | 41 | 235 | 174.5 |
| 20–24 | 32 | 176 | 181.8 | 57 | 291 | 195.9 |
| 25–29 | 25 | 186 | 134.4 | 33 | 303 | 108.9 |
| 30–34 | 13 | 147 | 88.4 | 17 | 249 | 68.3 |
| 35–39 | 4 | 113 | 35.4 | 6 | 176 | 34.1 |
| 40 and over | 2 | 92 | 21.7 | 1 | 161 | 6.2 |
| TFR | | | 3.04 | | | 2.94 |

Notes: a. Based on Cook, Weipa and Aurukun SLAs; b. based on Cook, Weipa, Aurukun and Carpentaria SLAs; c. Age-Specific Fertility Rate per thousand.

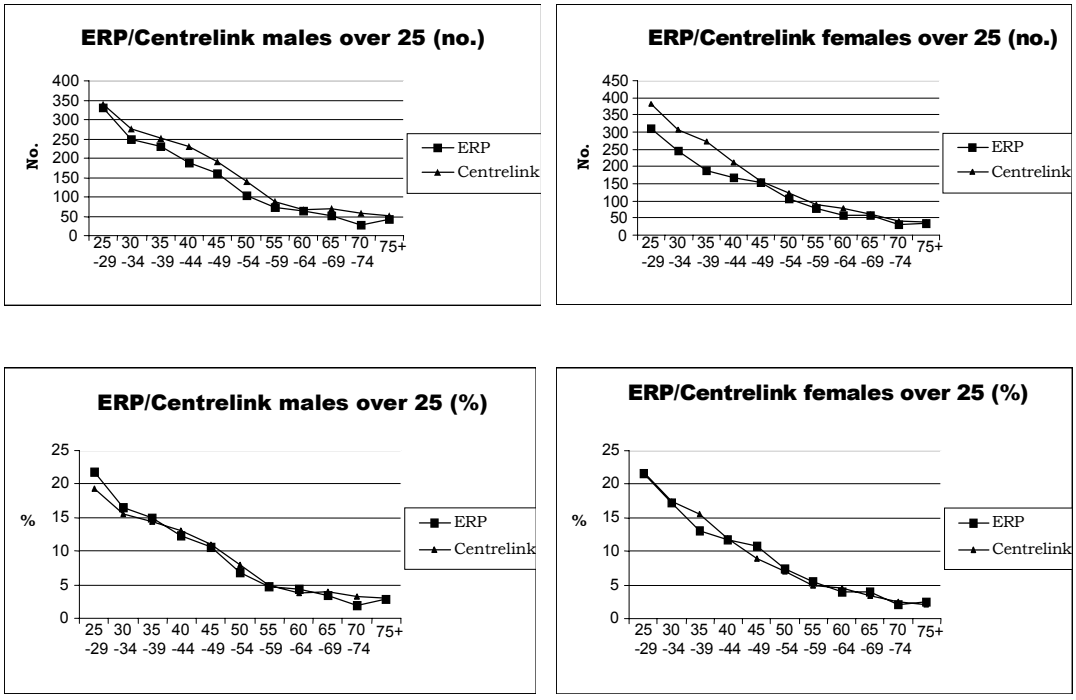
## Centrelink payments

Another source of population data is Centrelink records. To access these, the age and sex of all recipients of Centrelink payments in one of the several Cape York communities within the Peninsula ATSIC Region were downloaded from the Centrelink payments database at the end of one fortnightly payment round in October 1998. Unfortunately, these records did not distinguish Indigenous from other clients. However, according to the 1996 Census, the non-Indigenous population of the selected Cape York communities accounts for only 10 per cent

of the total population aged 25 years or over, and the vast majority of these are in relatively well paid employment and thus unlikely to be included in the Centrelink payments data. In all probability, then, payments data from Centrelink for this region refer almost exclusively to Indigenous clients.

A comparison of the age distribution of Centrelink data with the Peninsula ATSIC Region Indigenous ERP reveals a very close association. Fig. 2 shows remarkable similarity between the age distributions, but with the Centrelink data indicating distinctly higher numbers of females especially up to age 45. Overall, the Centrelink population aged 25 years and over is 5 per cent higher than the Peninsula Region ERP. Females account for all of this difference as male numbers are virtually identical, and numbers of females are probably higher because of their greater receipt of family and parenting payments. Given this overall result, it is tempting to suggest that Centrelink records might be used as a proxy source of regional demographic data for the purposes of inflating the ERP by age and sex.

**Fig. 2. Numeric and percentage age distributions for males and females in the Peninsula ATSIC Region**




However, there are a number of uncertainties that preclude this option unless further sensitivity analysis is undertaken. First, it is not known what proportion of Indigenous adults in Cape York are in receipt of Centrelink payments, and therefore included in the data. It has been asserted that this figure might be as high as 95 per cent (including recipients of CDEP income) (Pearson 2000: 55).

More statistically-derived estimates suggest a slightly lower figure, with the main source of income for around half of Indigenous adults in Cape York estimated to be from CDEP, and one-third from other government payments (ABS 1996b: 50). At the very least, though, these estimates provide prima facie evidence that Centrelink records refer to a sub-set of all adults, and as such would represent conservative population numbers. Moreover, there may well be CDEP participants who are not included in the 1998 Centrelink payments data, although one might surmise that most are, given that the estimates of regional welfare dependence cited above encompass CDEP participation. While all of this suggests that Centrelink payments data refer to minimum population numbers, it should also be borne in mind that there may be some recipients of welfare payments who indicate a Cape York community as their payment point, but who are not actually resident within the region. To be fair, the same comment might be made about census data on usual residence.

## Towards a composite estimate

Despite its apparent potential, the Centrelink data demands further analysis before it can be employed in constructing alternative population estimates. The strategy adopted here, therefore, uses the other three sources of data discussed above to build a composite estimate of the population of the Peninsula ATSIC region in 1996. The methodology comprises five main steps which can be summarised as follows:[1]

1. Use WPHC data to generate estimates of the Indigenous population aged 10 and over by age and sex for the six communities within the Peninsula ATSIC region for which these data are available.
2. Compare these estimates with ABS census counts of Indigenous people for the same six communities to derive 'inflation ratios' for each age–sex group.
3. Apply these ratios to the ABS 1996 Indigenous census count for the Peninsula ATSIC Region as a whole to derive an alternative estimate of the resident Indigenous population of the region aged 10 years and over.
4. Use school enrolment figures adjusted for age and geography to derive an estimate of numbers of Indigenous children aged 5–9.
5. Estimate the Indigenous population aged 0–4 by re-creating births occurring within the region between 1991 and 1996, using registered births data for 1996 and 1997.

Unlike ABS estimates, this methodology does not include a pro-rata allocation of those who did not state their Indigenous status at the 1996 census count. In 1996, a total of 773 individuals in the Peninsula ATSIC Region did not give their Indigenous status. On a pro-rata basis this suggests that the 1996 base count should be higher by 342. While the regional count may be adjusted in this way, it is not possible to also adjust the inflation ratios based on the six communities in the WPHC, as cell counts for these communities by age of those in the 'not stated' category are too small. This shortcoming means that the estimates produced here for Peninsula ATSIC Region are conservative.

## A composite estimate of the Cape York Indigenous population

The composite methodology delivers an estimate of the Indigenous population of Peninsula ATSIC region in 1996 of 6,504 persons. This is 869 persons (15.4%) higher than the 1996 Census Count of 5,635, and 320 persons (5.2%) higher than the 1996 ABS ERP of 6,184 (Table 4).

**Table 4. Census counts, ERP and composite estimates of the Peninsula ATSIC Region Indigenous population, 1996**

| | Census counts | | | ABS ERP | | | Composite estimate | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| 0–4 | 310 | 353 | 663 | 338 | 386 | 724 | 428 | 407 | 835 |
| 5–9 | 321 | 346 | 667 | 350 | 378 | 728 | 354 | 408 | 762 |
| 10–14 | 258 | 273 | 531 | 280 | 297 | 577 | 258 | 273 | 531 |
| 15–19 | 271 | 230 | 501 | 300 | 255 | 555 | 306 | 289 | 596 |
| 20–24 | 311 | 269 | 580 | 352 | 300 | 652 | 311 | 269 | 580 |
| 25–29 | 296 | 281 | 577 | 331 | 309 | 640 | 337 | 349 | 686 |
| 30–34 | 227 | 226 | 453 | 250 | 247 | 497 | 282 | 272 | 554 |
| 35–39 | 206 | 172 | 378 | 229 | 187 | 416 | 244 | 198 | 443 |
| 40–44 | 171 | 154 | 325 | 187 | 168 | 355 | 180 | 177 | 357 |
| 45–49 | 148 | 143 | 291 | 162 | 154 | 316 | 195 | 143 | 338 |
| 50–54 | 96 | 96 | 192 | 103 | 105 | 208 | 127 | 109 | 236 |
| 55–59 | 66 | 72 | 138 | 72 | 77 | 149 | 87 | 82 | 169 |
| 60–64 | 58 | 54 | 112 | 65 | 58 | 123 | 77 | 61 | 138 |
| 65–69 | 54 | 58 | 112 | 52 | 57 | 109 | 71 | 66 | 137 |
| 70–74 | 32 | 30 | 62 | 28 | 29 | 57 | 42 | 34 | 76 |
| 75+ | 28 | 25 | 53 | 43 | 35 | 78 | 37 | 28 | 65 |
| Total | 2853 | 2782 | 5635 | 3142 | 3042 | 6184 | 3337 | 3166 | 6504 |

Source: ABS 1996 Census and ERP; see text for calculation of composite estimate.

Fig. 3 illustrates the difference between the ERP and the composite estimate for 1996. The composite estimate is higher than the ERP across most of the age range but there are three age groups apparent from Table 4, but not from Fig. 3, in which the ERP indicates higher numbers: these are the groups aged 10–14, 20–24 and 75 and over. The scale of these differences is more readily appreciated from Table 4 and Fig. 4.

The composite estimate is markedly higher than the ERP at age 0–4, which suggests the ERP tends to understate the underlying fertility of Indigenous people in the Peninsula ATSIC Region. Indeed, the comparatively narrow base in the pyramid for the ERP seems inconsistent with the level of fertility apparent from analysis of births data.

The higher ABS estimates at ages 10–14 and 20–24 could be due to a number of factors. For the 10–14 age group, one possibility is that the clinic data for those in their mid-teens, from which these data are estimated, simply fail to capture those attending high school or staying with relatives outside the region on an extended basis. Similarly, the 20–24 age group is highly mobile and difficult to capture in either register- or census-based data collections (Martin & Taylor 1996: 14; Smith 2000).

**Fig. 3. ERP and composite estimate: Peninsula ATSIC Region, 1996**

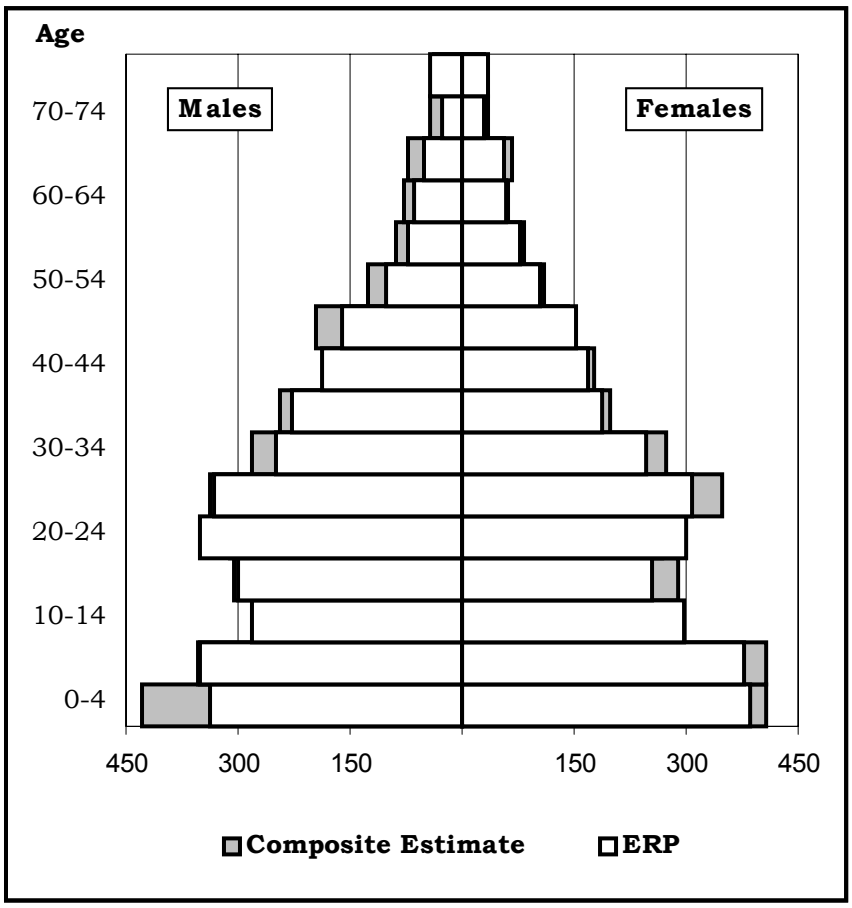
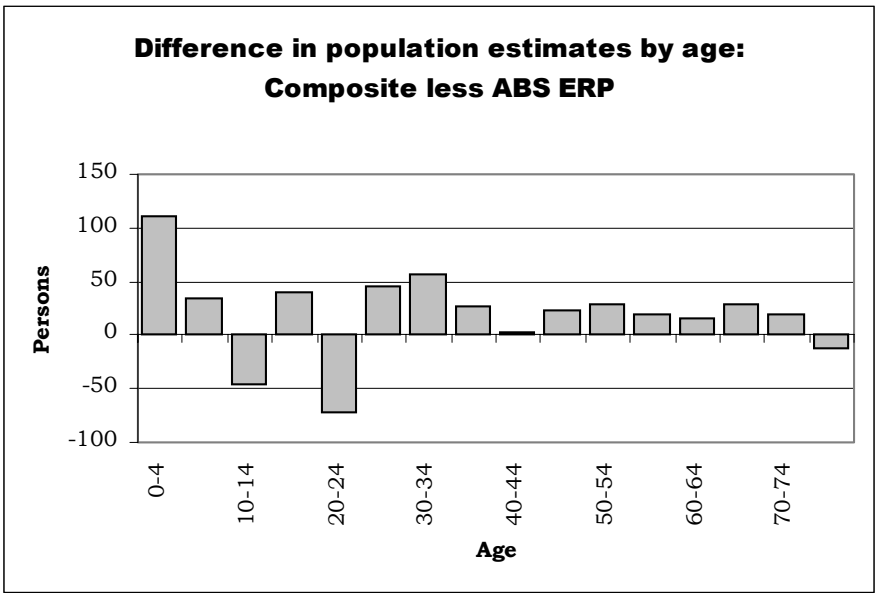


**Fig. 4. Differences between 1996 ERP and composite estimate for the Peninsula ATSIC Region**




## Projecting the Indigenous population in Cape York to 2016

While an essential objective of this paper has been to examine opportunities for creating alternative, composite estimates of the Indigenous population of Cape York, the primary goal is to explore Indigenous demographic futures and their consequences for policy. One dimension of the reliability of population estimates is their currency. At the time of writing, statistics from the 1996 Census were obviously very dated, and new ABS estimates based on the 2001 Census were not to be available until 2003. The time gap that opens up between available census data and the information needs that emerge in a range of policy and planning applications, is inevitable in the absence of inter-censal estimates and projections.

To date, planning processes in Indigenous communities have all too often made use of dated or deficient demographic information. This creates a sense of uncertainty in the enterprise of assessing the adequacy of policy to address shortfalls in social and economic infrastructure. Such policy development is typically reactive to needs as they become revealed (for example, in terms of post facto responses to housing shortages), as opposed to being proactive in seeking to anticipate and plan for expected requirements. However, proactiveness requires a measure of future requirements for government works and services, and this is something that is only rarely achieved for Indigenous communities (Taylor 1990). This is not the case for mainstream communities throughout Australia where the approach to settlement planning is much more prospective.

For example, State and local government planning authorities routinely develop future scenarios and often seek budgetary allocations on the basis of anticipated needs. A key element in this process is the production of small-area population projections or forecasts. While the ABS provides official projections of State and Territory and SLA populations, the individual States and Territories, in turn, also produce regional and local area projections, often down to the Local Government Area level (Bell 1992; Commonwealth of Australia 1997). For these purposes a standard cohort-component methodology is generally applied, and this practice is followed here.

## Projection assumptions

The cohort-component method carries forward the composite estimate for 1996 by successive five-year periods. The projection is based simply on ageing the population by five-year blocs, subjecting each group to age- and sex-specific mortality, fertility and net migration regimes as follows:

- Survival rates from Indigenous life tables for Queensland (ABS 1998) are applied and held constant for the projection period. This assumption is consistent with evidence that life expectancy for Indigenous people in recent times (1981–1996) has shown no sign of improvement (Gray 1997: 12).
- ASFRs based on 1996 and 1997 registered births data for the three SLAs of Cook, Weipa and Aurukun are applied. As noted above, these data produce a TFR of 3.04, which is substantially higher than the Indigenous TFR of 2.16 for Queensland as a whole and is more in line with rates reported from adjacent regions in northern Australia (Taylor & Bell 2001a).
- In the absence of an operational model of migration, and in light of the erratic pattern displayed by net migration estimates (Taylor & Bell 2001a), net migration is held at zero for all ages.
- No allowance is made for population change via shifts in Indigenous identification.

The main uncertainty in these projection assumptions is that concerning zero net migration at all ages. It is known that youth and young adults are a highly mobile group among the Cape Indigenous population. Consequently, they are often only marginally attached to regional institutions, are difficult to enumerate and may spend periods of time outside of the region (Martin & Taylor 1996; Smith 2000). Not surprisingly, these groups are relatively absent from the resident age distribution, though whether this reflects net migration loss is unclear: and it cannot just be assumed. Aside from this group, one of the drawbacks in establishing reliable net migration assumptions for the population in general is the lack of a firm model of Indigenous migration responses to regional economic development.

The limited work that has been done in this area suggests that despite the intent of regional agreements and other policy instruments to ensure local mobilisation of labour supply, targets are often met by the recruitment of labour from outside the region because local labour lacks either the skills or the motivation for

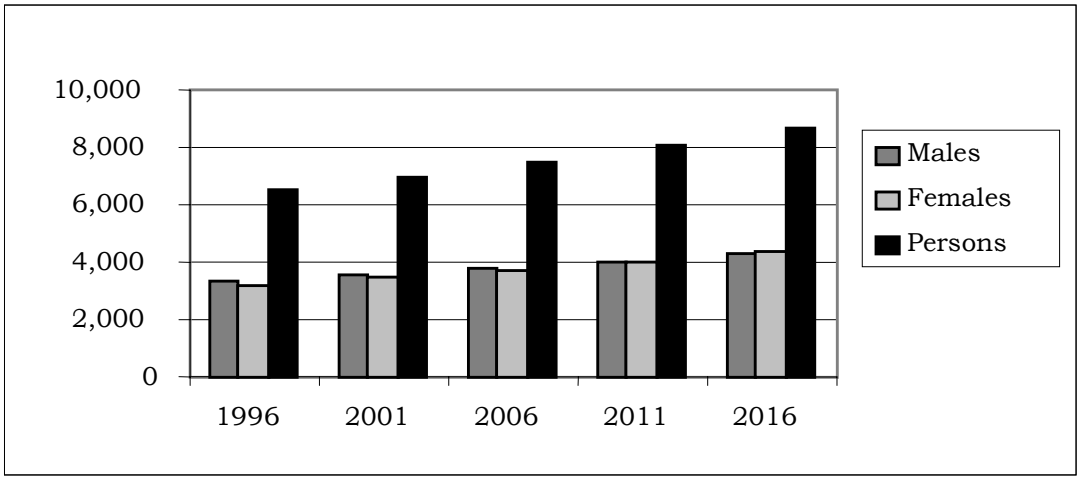
mainstream employment. This has certainly been the case at the Comalco mine at Weipa, and at Ranger in Kakadu (O'Faircheallaigh 1986; Taylor 1999), while similar evidence is available with respect to urban development in the Katherine region (Taylor 1988). Obviously, if Rio Tinto mining operations in Cape York Peninsula were to stimulate similar future responses, then net migration assumptions would need to reflect this. It is not inconceivable that job quotas for 'local' Indigenous people might serve to attract migrants into the region as has happened up to this point. The definition of 'local' would have some effect on the figures as there are people in adjacent regions, notably at Palm Island, Yarrabah and Cairns, whose traditional lands and social connections are in the Cape York region and who might accordingly qualify for 'local' jobs.

## Projection results

The actual projection is conducted separately for males and females in five-year blocs from 1996 to 2016. Projected births for the 1996–2001 period are added to the existing 1996 population and each cohort is then subjected to respective survival rates to arrive at an estimate of the population in each age-group in 2001. This process is continued through to 2016.

Indigenous population totals projected for the Peninsula ATSIC Region at the end of each five-year period from 1996 to 2016 are shown in Fig. 5 and Table 5. Overall, the population is projected to increase by 2,150, representing an increase of 33 per cent, or 1.65 per cent per annum.

**Fig. 5. Indigenous population projections: Peninsula ATSIC Region, 1996–2016**




It is interesting to consider these projections against projections made for the total population in the same region (Queensland Department of Local Government and Planning 2001). According to this comparison, in 1996, almost 60 per cent of

the resident population of Peninsula ATSIC Region was Indigenous. By 2001, this was projected to have fallen slightly, but in subsequent years the proportion rises steadily to reach 64 per cent by 2016 (Table 5). Given this rising Indigenous share of total population, the implication is for a decline in the number of non-Indigenous residents, albeit only slight, commencing in 2001. Such a trend is not inconceivable given that it has been seen across remote Australia as a whole since 1986 (Taylor 2000: 21). In the Cape York context, stimulus for such a loss is likely to stem from further rationalisation of the Comalco mine operation and downstream negative effects on local businesses. Elsewhere in the region, substantial numbers of non-Indigenous people are employed in service-type occupations in large Aboriginal communities, and while there is some scope for 'Aboriginalisation' of such positions, such a trend has yet to emerge. This prospect of reduced non-Indigenous residence raises a number of implications for regional employment, servicing and governance.

**Table 5. Indigenous population as a percentage of total population in the Peninsula ATSIC Region, 1996–2016**

| Year | Total population[a] (no.) | Indigenous population (no.) | Indigenous population (%) |
|---|---|---|---|
| 1996 | 10,934 | 6,523 | 59.6 |
| 2001 | 11,989 | 6,994 | 58.3 |
| 2006 | 12,437 | 7,485 | 60.2 |
| 2011 | 12,995 | 8,050 | 61.9 |
| 2016 | 13,537 | 8,673 | 64.0 |

Note: a. Based on Queensland government projections for Weipa, Aurukun and Cook SLAs from Queensland Department of Local Government and Planning (2001).

## Change in Indigenous demographic composition

Shifts in the age and sex composition of the regional population are shown in Fig. 6 in the form of five-yearly age pyramids for 1996 and 2016, while actual changes in numeric and percentage distribution by sex and five-year age-group are shown in Tables 6 and 7.

As a summary device, it is interesting to consider these changes in terms of the different age groups that typically form the target of social policy initiatives, at least as far as the five-year classification allows. These are shown in Table 8 and include the infant and pre-school years (0–4 years), the years of compulsory schooling (5–14 years), the years of school-to-work transition (15–24 years), the years of family formation and employment (25–44 years), the years of family dissolution (45–64 years), and an aged category of those over 65 years (which arguably in an Aboriginal context could be set at a much earlier cut-off point).

**Table 6. Indigenous population projection by five-year age-group: Peninsula ATSIC Region, 1996–2016**

| Age-group (years) | 1996 | 2001 | 2006 | 2011 | 2016 |
|---|---|---|---|---|---|
| 0–4 | 855 | 843 | 878 | 971 | 1,065 |
| 5–9 | 762 | 851 | 839 | 874 | 967 |
| 10–14 | 531 | 760 | 849 | 837 | 872 |
| 15–19 | 596 | 528 | 755 | 843 | 831 |
| 20–24 | 580 | 587 | 520 | 745 | 831 |
| 25–29 | 686 | 568 | 575 | 510 | 730 |
| 30–34 | 554 | 670 | 555 | 562 | 498 |
| 35–39 | 443 | 538 | 651 | 538 | 546 |
| 40–44 | 357 | 421 | 513 | 621 | 513 |
| 45–49 | 338 | 333 | 392 | 478 | 579 |
| 50–54 | 236 | 305 | 302 | 354 | 434 |
| 55–59 | 169 | 203 | 262 | 260 | 305 |
| 60–64 | 138 | 138 | 165 | 213 | 212 |
| 65–69 | 137 | 104 | 104 | 125 | 161 |
| 70–74 | 76 | 91 | 69 | 70 | 83 |
| 75+ | 65 | 55 | 57 | 49 | 47 |
| Total | 6,523 | 6,994 | 7,485 | 8,050 | 8,673 |

**Table 7. Percentage age and sex distribution of the Indigenous population: Peninsula ATSIC Region, 1996 and 2016**

| Age-group (years) | 1996 | | | 2016 | | |
|---|---|---|---|---|---|---|
| | Males | Females | Total | Males | Females | Total |
| 0–4 | 13.1 | 13.1 | 13.1 | 12.7 | 11.9 | 12.3 |
| 5–9 | 10.6 | 12.9 | 11.7 | 11.5 | 10.8 | 11.2 |
| 10–14 | 7.7 | 8.6 | 8.1 | 10.4 | 9.7 | 10.0 |
| 15–19 | 9.1 | 9.1 | 9.1 | 9.9 | 9.3 | 9.6 |
| 20–24 | 9.3 | 8.5 | 8.9 | 9.8 | 9.3 | 9.6 |
| 25–29 | 10.1 | 11.0 | 10.5 | 7.7 | 9.1 | 8.4 |
| 30–34 | 8.4 | 8.6 | 8.5 | 5.5 | 6.0 | 5.7 |
| 35–39 | 7.3 | 6.2 | 6.8 | 6.3 | 6.3 | 6.3 |
| 40–44 | 5.4 | 5.6 | 5.5 | 6.1 | 5.7 | 5.9 |
| 45–49 | 5.8 | 4.5 | 5.2 | 6.2 | 7.1 | 6.7 |
| 50–54 | 3.8 | 3.4 | 3.6 | 4.7 | 5.3 | 5.0 |
| 55–59 | 2.6 | 2.6 | 2.6 | 3.6 | 3.5 | 3.5 |
| 60–64 | 2.3 | 1.9 | 2.1 | 2.3 | 2.6 | 2.4 |
| 65–69 | 2.1 | 2.1 | 2.1 | 2.0 | 1.7 | 1.9 |
| 70–74 | 1.3 | 1.1 | 1.2 | 0.9 | 1.0 | 1.0 |
| 75+ | 1.1 | 0.9 | 1.0 | 0.5 | 0.6 | 0.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Fig. 6. Age pyramids for the Indigenous population of Peninsula ATSIC Region, 1996 and 2016.**

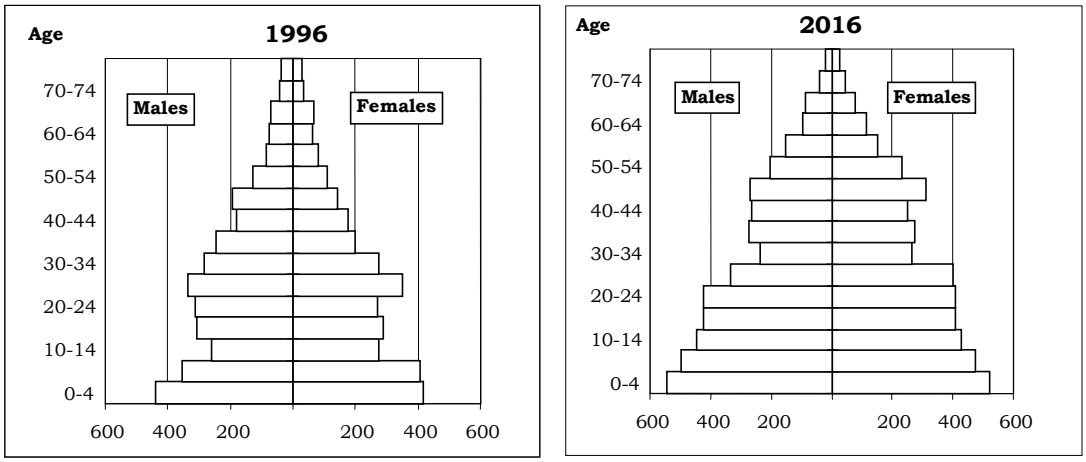



**Table 8. Absolute and per cent change in the size of social policy target groups: Peninsula ATSIC Region, 1996–2016**

| Age-group (years) | 1996 | 2016 | Absolute change | % change |
|---|---|---|---|---|
| 0–4 | 855 | 1,065 | 210 | 25 |
| 5–14 | 1,293 | 1,839 | 546 | 42 |
| 15–24 | 1,176 | 1,662 | 486 | 41 |
| 25–44 | 2,040 | 2,287 | 247 | 12 |
| 45–64 | 881 | 1,530 | 649 | 74 |
| 65+ | 279 | 291 | 12 | 4 |
| Total | 6,523 | 8,673 | 2,150 | 33 |

The effects of sustained high fertility, population momentum and overall ageing are clearly visible. Population momentum refers to the movement of larger, or smaller, cohorts up the age structure, replacing their smaller (or larger) predecessors. Large numeric increase is evident among school-age children and in the transition years to work and family formation. However, the greatest increase is found among those of older working age (45–64), with this group almost doubling in size by 2016 due to ageing of cohorts that were in the 20–39 years age range in the mid 1990s. It is important to recognise that these changes may not eventuate if significant levels of migration, either to or from the region, occur in any of these age groups. Indeed, the magnitude of these changes underlines the critical importance which attaches to deriving a better understanding of mobility among Indigenous people into and out of the Cape region. This is a fundamental prerequisite for improved estimates and projections of population change.

While further analysis would be required to establish the precise levels, it is a fact that many Cape York residents in these older cohorts have been dependent for much of their adult life on welfare, either via CDEP or more directly from Centrelink and its predecessors. As these cohorts age further, their lack of meaningful work experience and attendant deficiency in skills is significant, given the basic aim of governments and regional Indigenous organisations to foster Indigenous participation in sustainable economic development. Capacity building within this context is rendered problematic, and needs to be expanded conceptually beyond the mere provision of jobs and training into more social arenas such as facilitating the role of older residents in community and cultural leadership. The effects of increased morbidity and disability among Indigenous people in middle age and beyond must also be taken into account.

Although the projections point to substantial increases in school-age and young adult populations, it is difficult to be certain about the changing profiles of these age groups as they are highly susceptible to possible shifts in fertility rates. School participation outside the region and migration for jobs and training are also unpredictable variables. Much greater certainty, however, surrounds the size and age composition of the adult population aged over 25 years. On the whole, these individuals are already resident within the region and, compared to their non-Indigenous counterparts on the Cape, are invariably located in home country and less likely to migrate.

## Projection refinements

The population projections presented above are correct according to the algorithms applied within the scope of the present study. However, there are several refinements that, if developed, would provide for greater certainty in the assumptions underlying the projections, and would allow improved targeting of policy responses as well as assessment of the implications of demographic change in particular regional contexts.

An obvious such refinement is possible after each five-yearly census count. The forecasts presented here are based on 1996 population counts, but by 2003 new regional population estimates will be available from the 2001 Census. These can be used to assess the validity of the current projections for 2001, while new projections may also be developed using the latest population estimates as the base.

Scope also exists to alter the spatial boundaries employed to define the region of interest. In the event that a wider geographic catchment is required then it would be a simple matter of identifying the larger unit and supplementing the analysis accordingly with data for the appropriate SLAs. If, however, a more tightly defined geographic space is called for, or some idea of future numbers in specific localities were desired, then options exist for applying ratio allocation techniques based on the current regional projections in much the same way as has been employed elsewhere (Taylor 2001).

There may also be scope for some refinement of net migration assumptions based on a greater appreciation of regional economic development plans, especially in regard to Indigenous employment targets, and general social and economic factors that may induce migration. An allied issue here would be more detailed analysis of inter-regional population movement for education and training purposes.

One device frequently deployed to canvass a range of possible projection outcomes is the calculation of several projection series based on varying assumptions. The current calculations involve the use of only one series. An obvious option, then, for further development of these projections would be to generate alternative scenarios based on possible combinations of falling/ rising/stable fertility and mortality and varying assumptions about net migration. While there is some heuristic potential here, it obviously makes sense to base such exploration on plausible indicators, and so the indicators themselves would also need to be assessed.

In using the projections as a means of targeting policy, it is possible to estimate the future size of the Indigenous and non-Indigenous resident labour force by applying labour force participation rates to the projected working-age populations. If likely future trends in employment numbers could also be established, then the quantum of need for additional job creation may be calculated according to specified or agreed employment levels. This exercise would essentially represent a regionalised version of similar calculations of Indigenous employment demand made at the national level (Taylor & Hunter 1998).

Finally, an abiding feature of population projections is the stimulus they provide for debate on the future demographic outcomes of particular social and economic behaviours. It is possible to repackage the projection results in ways that best suit different audiences, including in interactive formats—for example by providing a capacity for planners and decision-makers to vary the underlying assumptions and thereby explore alternate planning scenarios.

## Conclusion

There are two sets of conclusions to be drawn from this development of a composite Indigenous population estimate for Cape York. The first is concerned with methodological issues, and the second relates to the policy implications of revised estimates.

It is important to note that the composite estimates presented here do not seek to modify or build upon existing ABS ERPs, they simply provide an alternative set of figures that are based on a different methodology and draw on a variety of data sources, including the census count. To this extent, there is no sense in which one set of estimates is more 'correct' than another—they are merely reflections of the methodologies applied.

At the same time, a judgement can be made about which methodology is likely to produce a population that is closest to actual numbers on the ground. The methodology adopted here employs regionally-derived alternative counts of the Indigenous population using administrative data sets as a benchmark for adjusting census counts. It also applies to regionally-derived ASFRs.

That quite different counts of the same population can be derived from different methodologies has been amply demonstrated, not least in this region (Martin & Taylor 1996), and the same outcome is found again through the application of school enrolment, clinic and birth registration data. By comparison, ABS Indigenous population estimates apply only limited regional data, preferring national or State-wide parameters. The trade-off is consistency of approach in addressing the need to balance local and national population totals. It is our view that this trade-off can undermine the accuracy of population estimates in regions such as Cape York Peninsula where clear indications of census undercount exist.

By applying local proxy demographic data, we have demonstrated that alternative approaches to estimation are available and achievable. While further refinement of technique is required, and while data sources warrant more validation, there is sufficient evidence in the analysis and results presented here to draw the conclusion that the 1996 ABS Indigenous ERP for Cape York is deficient, both in terms of overall numbers and for specific age groups.

The policy implications of these revised estimates are wide-ranging. First of all, they raise the prospect, for regional and State authorities, of developing alternative population estimates and projections in addition to those available from the ABS. While this may seem a radical development, the ABS has itself in the past mooted the development of 'service population' estimates as an adjunct to ERPs (ABS 1996c). In the case presented here, adoption of alternative estimates would impact on the calculation of rate and ratio measures, as the larger denominator would reduce those derived from consistent numerators.

The effect of a more broadly based pyramid in the composite estimate for Cape YorkPeninsula, reflecting larger numbers of children, needs to be considered. While more work is required to better understand the apparent dearth of teenagers and young adults in the population, considerable momentum for future growth is evident in the new age distribution and progressive ageing will see the effects move with time into older age-groups. Thus, existing social and economic pressures affecting different age-groups in the population (children, youth, and adults both young and old) can only intensify, all other things being equal, as these larger birth cohorts advance through the age profile. There is also an indication that there are more adults than previously estimated, especially in the groups aged 25 years and over. Given what is known about the limited workforce experience and high level of welfare dependency among individuals in these cohorts, this raises the stakes in regard to capacity building for regional social and economic development. The quantum of officially recognised need in Cape York Peninsula is, in this regard, amplified at a stroke.

## Notes

1. Steps 1 and 5 of the methodology involve complex procedures, and a brief amplification of these is provided in Taylor and Bell (2001b: 15–16).

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