



August 2008

# An overview of the economic impact of Indigenous disadvantage

Report by Access Economics Pty Limited for  
**Reconciliation Australia**

## TABLE OF CONTENTS

<b>Glossary and Acronyms .....</b>	<b>iii</b>
<b>Executive Summary .....</b>	<b>iv</b>
<b>1. Introduction .....</b>	<b>1</b>
1.1 Methodological Overview .....	1
1.2 Gaps in Indigenous Data .....	2
1.3 Report Structure .....	2
<b>2. Estimating GDP and Living Standards .....</b>	<b>3</b>
2.1 Introduction and Overview .....	3
2.2 Parameters used to Estimate Lost Output .....	3
2.3 What is being Modelled — Summary of the Base Case and the ‘what if’ scenario .....	5
2.4 Modelling Approach .....	6
2.5 Base Case Defined in Detail .....	7
2.6 The ‘what if’ Scenario Defined in Detail .....	14
2.7 Calculated Model Inputs .....	18
2.8 Results .....	19
<b>3. A Change in the Structure of Government Budgets .....</b>	<b>22</b>
3.1 Introduction .....	22
3.2 Revenue .....	23
3.3 Expenditure .....	25
<b>4. Burden of Disease .....</b>	<b>39</b>
4.1 Overview and Definitions .....	39
4.2 Burden of Disease .....	40
4.3 Excess Burden of Disease Among Indigenous Australians .....	46
<b>5. Conclusions .....</b>	<b>47</b>
<b>6. References .....</b>	<b>48</b>
<b>Appendix A: Calculation Method for Projections of Government Budget Scenarios .....</b>	<b>51</b>
<b>Appendix B: Differences in estimates of the Life Expectancy Gap between Indigenous people and all Australians .....</b>	<b>59</b>

## CHARTS

Chart 2-1: Indigenous and non-Indigenous population distributions, 2007 and 2026 — the base case	8
Chart 2-2: Forecast life expectancy at birth by gender and population group — base case	10
Chart 2-3: Comparison of range of industry specific average weekly earnings	14
Chart 2-4: Indigenous life expectancy and mortality distributions, 2007 and 2026	15
Chart 2-5: ‘What if’ scenario Indigenous population forecast and change in age distribution	16

Chart 2-6: 'What if' scenario on employed Indigenous participation by industry	17
Chart 2-7: Change in total weekly industry earnings and average weekly earnings	18
Chart 2-8: Comparative populations' income quintile* distribution by highest educational attainment level	21
Chart 2-9: Average weekly income based on highest level of educational attainment and equivalent income profiles	21
Chart 3-1: Total expenditure (all Australians) incorporated in this analysis, \$ million, 2007	26

## TABLES

Table 2-1: Summary base case assumptions	6
Table 2-2: Summary of what was modelled (the 'what if' scenario)	6
Table 2-3: Labour force participation, 2004-05 age standardised (% population 15 to 64)	10
Table 2-4: Relative income ratios for employed persons aged 15 years and over, median gross weekly individual income (a)	13
Table 2-5: Industry specific weightings by type of occupation	13
Table 2-6: Indigenous and Australian populations compared (number of people)	14
Table 2-7: Indigenous and Australian labour force compared (number of people)	17
Table 2-8: Inputs for AE-GEM model	18
Table 2-9: Results of AE-GEM analysis	19
Table 3-1: Impact on government revenue (\$2009 million)	24
Table 3-2: Welfare projections and savings, (2009 dollars \$'000) (a)	28
Table 3-3: Health expenditure per capita, by broad health service and Indigenous status, 2004-05 and 2009	30
Table 3-4: Impact on government health expenditure in 2029(a)	31
Table 3-5: Attainment of national benchmarks, 2005	33
Table 3-6: Impact of education participation on government budgets(a)	33
Table 3-7: Impact of education related welfare on government budgets(a)	34
Table 3-8: Impact of justice on government budgets (a)	35
Table 3-9: Public and community housing related changes to government budgets (a)	37
Table 3-10: Rental assistance changes to government budgets (a)	38
Table 4-1 Rank of leading causes of DALYs, Indigenous Australian and total Australian populations, 2003	43
Table 4-2 Leading causes of premature death (YLLs) of Indigenous Australians, 2003	44
Table 4-3 Leading causes of years lived with disability of Indigenous Australians, 2003	45
Table 6-1 Differences in the ABS and AE life expectancy gap estimates	59

## **GLOSSARY AND ACRONYMS**

---

ABS	Australian Bureau of Statistics
AE-DEM	Access Economics Demographic Model
AE-GEM	Access Economics General Equilibrium Model
AIHW	Australian Institute of Health and Welfare
AWE	Average weekly earnings
CDEP	Community Development Employment Program
CVD	Cardiovascular Disease
DALY	Disability-Adjusted Life Years
DEEWR	Department of Education, Employment and Workplace Relations
FaHCSIA	Department of Families, Housing, Community Services and Indigenous Affairs
GDP	Gross Domestic Product
GST	Goods and Services Tax
SCRGSP	Steering Committee for the Review of Government Service Provision
TWE	Total weekly earnings
VET	Vocational Education and Training
YLD	Years Lived with a Disability
YLL	Years of Life Lost

---

## EXECUTIVE SUMMARY

Reconciliation Australia commissioned Access Economics to assess the economic benefits of alleviating Indigenous disadvantage including:

- 1 the impact on Gross Domestic Product (GDP) and living standards in Australia; and
- 2 the impact on the structure of government budgets.

The aim is to provide a ‘what if’ style scenario analysis — to depict a hypothetical Australia where Indigenous Australians face the same opportunities and experiences as all Australians. The focus is on ‘what could be’. The complex policy and program mechanics of how to achieve a real reduction in the disadvantages faced by Indigenous Australians are not addressed.

### IMPACT ON GDP

The analysis in this report shows there are sizeable economy wide benefits to be achieved from improving the quality of life of Indigenous Australians. In a ‘what if’ scenario based on raising the life expectancy of Indigenous Australians and increasing the proportion of the Indigenous population in the workforce and who are able to take on higher skilled and better paid jobs to levels commensurate with those of all Australians, real GDP could be 1% higher than otherwise in 2029 — equivalent to around \$10 billion today. Further, since the increase in GDP is larger than the forecast increase in the total population, national living standards for all Australians would increase. There are therefore clear economic benefits from government action to reduce Indigenous disadvantage.

The economic benefits will only be realised if the health and educational attainment of Indigenous Australians improves. In fact the modelling outcomes are predicated on the many facets of Indigenous disadvantage that contribute to their poorer health and labour market outcomes being addressed. In another light, achieving the economic benefits implies an improved quality of life for Indigenous people — a reduction in the burden of disease and an improvement in the ability of Indigenous Australians to share in economic prosperity. These are generally not counted in economic indicators of progress but are nevertheless additional — and no less important — payoffs associated with the ‘what if’ scenario modelled here.

### IMPACT ON THE STRUCTURE OF GOVERNMENT BUDGETS

Estimates of the impact of improvements in Indigenous life expectancy, labour force participation and labour productivity on government budgets are summarised in the table below. These estimates do not include the costs of government programs designed to address problems of Indigenous disadvantage but rather illustrate the scale of the strengthening in government budgets that would flow from improved conditions for Indigenous Australians no matter the source of that improvement.

If the circumstances of Indigenous Australians improve to match those of the Australian average:

- ❑ government revenue in 2029 would be \$4.6 billion higher than otherwise; and
- ❑ government expenditure in 2029 in key portfolios relevant to Indigenous Australians would be \$3.7 billion lower than otherwise.

## SUMMARY OF GOVERNMENT BUDGET OUTCOMES (2009 \$M)

Government revenue (2009 \$m)	Baseline revenue 2009	Baseline revenue 2029	Shock revenue 2029		Increase in revenue 2029	Increase in 2029 due to shock
<b>Income</b>						
Income Tax	\$105,498	\$124,786		\$126,476	\$1,690	1.35%
GST	\$49,927	\$63,816		\$64,350	\$533	0.84%
Corporate tax	\$67,467	\$79,801		\$80,577	\$776	0.97%
Other Revenues	\$187,726	\$234,514		\$236,579	\$1,628	0.69%
<b>TOTAL REVENUE</b>	<b>\$410,618</b>	<b>\$502,917</b>		<b>\$507,981</b>	<b>\$4,626</b>	<b>0.92%</b>
Government Budgets (2009 \$m)	Baseline Indigenous Expenditure		Indigenous Shock Expenditure (2029)		Overall Savings	
	2009	2029	Life Expectancy	LE & Labour Force*	Combined shocks	Increase in 2029 due to shock
<b>Welfare</b>						
Newstart Allowance	\$404	\$629	\$660	\$156	\$473	75%
Youth Allowance	\$93	\$111	\$114	\$21	\$90	81%
Parenting Payment Partnered	\$84	\$127	\$133	\$39	\$88	69%
Parenting Payment Single	\$330	\$496	\$519	\$168	\$328	66%
Sickness Allowance	\$2	\$3	\$4	\$3	\$1	21%
Disability Support	\$376	\$550	\$575	\$321	\$230	42%
Aged Pension	\$129	\$334	\$429	\$563	-\$229	-68%
Carer's Payment	\$65	\$98	\$104	\$56	\$42	43%
Carer's Allowance	\$60	\$91	\$97	\$52	\$39	43%
CDEP	\$120	\$175	\$185	\$5	\$170	97%
<b>Total</b>	<b>\$1,663</b>	<b>\$2,613</b>	<b>\$2,818</b>	<b>\$1,383</b>	<b>\$1,231</b>	<b>47%</b>
<b>Health</b>						
Admitted patient services - private hosp	\$24	\$35	\$37	\$132	-\$98	-280%
Admitted patient services - public hosp	\$1,425	\$2,077	\$2,193	\$1,071	\$1,007	48%
Medical services	\$194	\$283	\$298	\$602	-\$319	-113%
Community health services	\$686	\$1,000	\$1,056	\$183	\$817	82%
Dental services and other professional	\$49	\$71	\$75	\$83	-\$12	-17%
Pharmaceuticals	\$100	\$145	\$153	\$314	-\$169	-116%
Services for older people	\$41	\$60	\$64	\$228	-\$168	-278%
Patient transport	\$141	\$205	\$216	\$73	\$132	65%
Public health activities and research	\$169	\$247	\$260	\$144	\$102	42%
Other health services	\$106	\$154	\$163	\$109	\$45	29%
<b>Total</b>	<b>\$2,935</b>	<b>\$4,278</b>	<b>\$4,515</b>	<b>\$2,939</b>	<b>\$1,339</b>	<b>31%</b>
<b>Education</b>						
Preschool	\$101	\$150	\$154	\$253	-\$103	-68%
Primary and Secondary	\$1,411	\$1,710	\$1,767	\$1,825	-\$115	-7%
Tertiary (Higher Education)	\$196	\$309	\$330	\$527	-\$219	-71%
Vocational Employment Training (VET)	\$212	\$333	\$356	\$145	\$188	57%
IESP	\$52	\$73	\$77	\$77	-\$4	-5%
IEDA	\$68	\$106	\$112	\$112	-\$6	-6%
Abstudy	\$208	\$319	\$341	\$80	\$239	75%
Austudy and Youth Allowance	\$13	\$20	\$22	\$7	\$13	66%
<b>Total</b>	<b>\$2,262</b>	<b>\$3,021</b>	<b>\$3,160</b>	<b>\$3,026</b>	<b>-\$5</b>	<b>0%</b>
<b>Justice</b>						
Open plus periodic detention	\$136	\$205	\$219	\$19	\$186	91%
Secure	\$430	\$650	\$694	\$59	\$592	91%
Community Corrections	\$51	\$77	\$82	\$8	\$69	89%
<b>Total</b>	<b>\$616</b>	<b>\$933</b>	<b>\$996</b>	<b>\$87</b>	<b>\$846</b>	<b>91%</b>
<b>Housing</b>						
Indigenous community housing	\$63	\$92	\$97	\$97	-\$5	-6%
National community housing	\$17	\$24	\$25	\$9	\$15	63%
State owned and managed indigenous	\$85	\$124	\$131	\$131	-\$7	-6%
National public (State owned) housing	\$160	\$233	\$246	\$63	\$170	73%
Commonwealth Rental Assistance	\$76	\$115	\$123	\$76	\$39	34%
<b>Total</b>	<b>\$401</b>	<b>\$588</b>	<b>\$622</b>	<b>\$375</b>	<b>\$213</b>	<b>36%</b>
<b>TOTAL EXPENDITURE</b>	<b>\$7,876</b>	<b>\$11,433</b>	<b>\$12,111</b>	<b>\$7,810</b>	<b>\$3,623</b>	<b>32%</b>
<b>TOTAL AVAILABLE TO GOVERNMENTS EACH YEAR FROM 2029</b>					<b>\$8,250</b>	

LFP = labour force participation rates \* LE and LFP combined represents the move by the indigenous population to average expenditure per capita as the Indigenous LFP approaches the Australian average. That is, as indigenous labour force status improves the requirement for welfare decreases. Similarly, as education participation increases, labour force status also improves.

## Conclusions

Foreshadowing possible policies and programs required to achieve the economic benefits was out of scope for this project. However, the analysis of government budgets suggests that from 2029, there will be an additional \$8.3 billion available to governments each year if Indigenous disadvantage were alleviated. In principle, these additional public funds could be allocated to policies and programs aimed at improving the quality of life of Indigenous Australians. Monitoring and evaluation are necessary accompaniments of such an approach. If potential future benefits are used to justify upfront investments in education and health infrastructure, interim targets for the health and education workforce and complementary infrastructure, in concert with interim objectives measured in terms of outcomes for Indigenous people — for example, child health and educational achievement — are vital in tracking whether the benefits are being achieved.

The Australian Government's current approach includes interim objectives to halve the literacy and numeracy achievement gap within a decade, halve the gap in employment outcomes within a decade, and provide Indigenous children with access to quality preschool programs within 5 years (Macklin, 2008). To some extent, these interim objectives are augmented with provisional infrastructure targets, although the latter could be strengthened with a view to increasing certainty that the potential economic benefits and improvements to Indigenous people's wellbeing will be achieved in the foreseeable future.

## Access Economics August 2008

## 1. INTRODUCTION

In February 2008, Reconciliation Australia commissioned Access Economics to assess:

- 1 the impact on GDP and living standards in Australia if the circumstances of Indigenous people were improved and reflected that of the all-Australian average in terms of life expectancy, labour force participation and earnings;
- 2 how this might affect the structure of government budgets; and
- 3 how the health related quality of life of Indigenous people might change.

A large number of reports have amassed evidence of the poor living standards, quality of life and socioeconomic outcomes of Indigenous people relative to other Australians.<sup>1</sup> While the costs of Indigenous disadvantage are sustained by Indigenous individuals and communities, there are also broader costs to the Australian society and economy. This report focuses on the tangible economic costs — the benefits that would otherwise accrue if Indigenous Australians lived as long as all Australians, were able to participate in the workforce to the same extent and had the same earning capacity. These tangible economic costs can be measured in terms of foregone output and economic wellbeing (output per Australian).

The aim of this project is to provide a ‘what if’ style scenario analysis — to depict a hypothetical Australia where Indigenous Australians face the same opportunities and experiences as all Australians. The focus is on ‘what could be’. The potentially complex policy and program mechanics of how to achieve a real reduction in the disadvantages faced by Indigenous Australians are not addressed here.

### 1.1 METHODOLOGICAL OVERVIEW

The project was split into three parts.

- 1 **Estimating the impact on GDP and living standards.** The Access Economics General Equilibrium Model (AE-GEM) was used to forecast the impact on GDP and living standards in Australia if Indigenous life expectancy, Indigenous labour force participation rates and Indigenous productivity rates increased over 20 years so that they matched the national Australian average in 2026. This was compared with a base case in which Indigenous life spans, labour force participation rates and labour productivity remained at current levels for the next 20 years.
- 2 **A change in the structure of government budgets (revenue and expenditure).** The AE-GEM modelling outputs were used to estimate the impact of improvements in Indigenous life expectancy, labour force participation, and labour productivity on government revenue (Australian, State and Territory). The impact on government expenditure on mainstream programs was calculated by estimating current expenditure per head (Indigenous and all Australians) and adjusting the relevant population of Indigenous people for changes in life expectancy, participation in education or other relevant variables. Welfare payments (including employment payments such as Newstart Allowance, and other payments such as the Disability Support Pension and Aged Pension), health system expenditure, education expenditure, housing (including Commonwealth Rent Assistance) and justice system expenditure were included in the analysis.

---

<sup>1</sup> For example, SCRGSP 2007 and ABS/AIHW 2005.

- 3 **Burden of disease:** The University of Technology, Queensland, produced a report on the burden of disease among Indigenous people (Vos et al, 2007). Their estimates of the excess burden of disease experienced by Indigenous Australians are summarised here.

## 1.2 GAPS IN INDIGENOUS DATA

As part of this project, Reconciliation Australia requested the identification of data gaps for Indigenous Australians. A number of gaps have been itemised in other reports (see for example, various ABS information papers, SCRGSP 2007 and ABS/AIHW 2005). Some gaps are being rectified gradually over time (for instance, inclusion of Indigenous status in Medicare data collections). For this project, additional information that facilitated comparisons between Indigenous and non-Indigenous people over time about the following would have been useful:

- hours worked by occupation and industry;
- employment income by occupation and industry;
- Indigenous migration patterns, between States and Territories and internationally;
- government revenue and the contribution of Indigenous Australians;
- consistency in reporting educational participation rates (age groups and time series);
- persons per household for community housing; and
- epidemiological information. Vos et al, (2007) noted that available data for Indigenous Australians is limited and data sources allowing direct measurement of disease parameters for Indigenous Australians are few. Those which are available are often not representative for all Indigenous Australians.

## 1.3 REPORT STRUCTURE

The report reflects the three components of the project.

- Chapter 2 details the approach and findings of the general equilibrium modelling.
- Potential changes in the structure of government budgets are discussed in Chapter 3.
- Health related quality of life and the excess burden of disease experienced by Indigenous Australians are outlined in Chapter 4.
- Brief conclusions about the implications of these three components are made in Chapter 5.

Note: consistent with the approach of the Australian Bureau of Statistics and others, the term “Indigenous” in this report encompasses Aboriginal and Torres Strait Islander Australians.

## 2. ESTIMATING GDP AND LIVING STANDARDS

The discussion in this chapter focuses on the methodology and findings of the general equilibrium modelling used to estimate the additional output that would accrue if the Indigenous life span, Indigenous labour force participation rates and earnings rates were the same as the Australia-wide average by 2026. Projections are generated for 20 years and beyond (2009 to 2029+) — reflecting views about the length of a generation.

### 2.1 INTRODUCTION AND OVERVIEW

First, it is important to note that the discussion in this Chapter includes references to the years 2026 as well as 2029. The reasons are outlined in Box 2-1.

#### Box 2-1 Explanation of why this Chapter refers to both 2026 and 2029

Throughout this chapter references are made to the years 2026 and 2029. While this can cause confusion, it reflects the nature of the parameters used as inputs to the modelling, and our modelling aims.

The modelling objective was to project gross domestic product (GDP) 20 to 30 years into the future. This projection period was chosen based on an approximation of the length of a generation. However, projections of the Indigenous population were only available to 2026 (because of the underlying fertility, mortality and other input projections available). The estimates made in this paper therefore assume the gap in life expectancy between Indigenous people and all Australians is closed by the year 2026. Nevertheless, the modelling generates projections to 2029 and 2040. The analysis of government budgets in Chapter 3 is also based on generating positive change within a generation (2009 to 2029) and is consistent with the modelling in this Chapter.

Previous international and Australian studies have estimated the output foregone as a result of Indigenous people having less education and poorer health outcomes and thus lower employment and productivity rates. Taylor and Stanley (2005) calculated that, in the Thamarrurr region of the Northern Territory (NT), the opportunity cost of the status quo for Indigenous people (the output gap) was \$43.8 million per annum in 2004.

In Thamarrurr, 82% of incomes were derived from welfare payments, and the median age at death was 46 years (Taylor and Stanley 2005:6-7). The output gap was calculated by applying NT average employment rates and average output per worker to the population of the Thamarrurr region. This methodology follows that of the *Canadian Royal Commission on Aboriginal Peoples* (1996), where the opportunity cost was measured in terms of national production foregone as a result of the continued poor socioeconomic status of Indigenous people.

### 2.2 PARAMETERS USED TO ESTIMATE LOST OUTPUT

The Indigenous population, labour force participation and productivity were selected as parameters for economic modelling. Other things constant, if more Indigenous people

participate in the workforce<sup>2</sup>, if Indigenous people are able to expand the number of hours they work per year, or if they produce more output per person per year, the higher the overall potential output produced and the higher Australian living standards (GDP per head). Life expectancy was used as a proxy for the Indigenous population, and average weekly earnings as a proxy for labour productivity.

Improvements in life expectancy, workforce participation and productivity depend on addressing the many facets of Indigenous disadvantage — broadly defined as health and educational outcomes. Health and education are not explicitly modelled to avoid double counting, but are nevertheless the key to improving the three modelled parameters (see for example, Box 2-2).

---

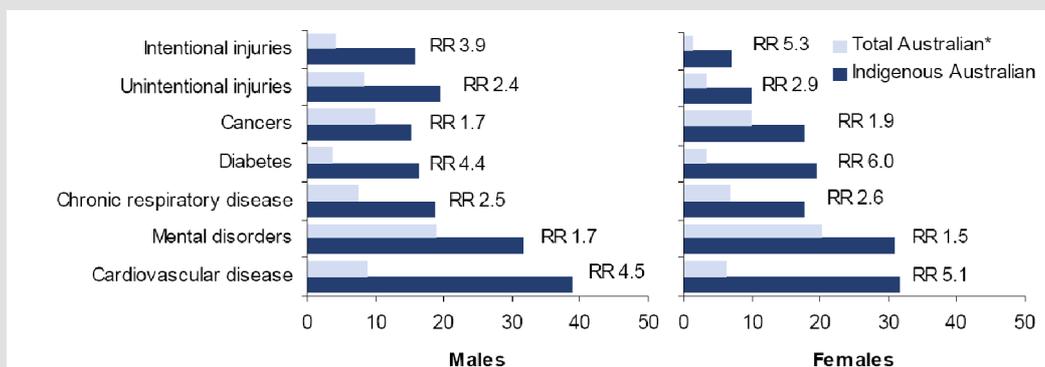
<sup>2</sup> People who are employed or actively looking for work are participating in the labour force. More Indigenous people in the workforce may be achieved by an increase in the Indigenous population or an increased propensity to participate.

**Box 2-2 Indigenous health and workforce participation**

Illness and disease can substantially reduce workforce participation and productivity. For example, the Productivity Commission (2007) cited studies that found, compared with the all-Australian average:

- people with mental illness had workforce participation rates close to 30 percentage points lower;
- serious injury reduced participation rates by 13 percentage points;
- type 2 diabetes reduced participation rates by around five percentage points; and
- CVD reduced participation by around three percentage.

The top seven broad causes of the Indigenous disease burden in 2003 in order from the highest were CVD, mental disorders, chronic respiratory disease, diabetes, cancers, unintentional injury, and intentional injury. The largest differentials in DALYs per 1,000 people between Indigenous and all Australians were for CVD, diabetes mellitus and intentional injuries in both males and females (Vos et al 2007:30). Figure 4.4 from Vos et al (2007) is reproduced here. **Preventing and ameliorating illness and disease among Indigenous Australians is likely to substantially improve Indigenous workforce participation.**



\* Age standardised to the total Indigenous Australian population, 2003  
 RR Indigenous Australian to total Australian rate ratio

Figure 4.4: DALY rate per 1,000 and rate ratios for the leading broad cause groups by sex, Indigenous Australian and total Australian populations, 2003

Source: Productivity Commission (2007) and Vos et al (2007).

**2.3 WHAT IS BEING MODELLED — SUMMARY OF THE BASE CASE AND THE ‘WHAT IF’ SCENARIO**

Lost output is estimated by comparing the base case with the ‘what if’ scenario. A summary of the base case and ‘what if’ scenario is provided here. The base case is outlined in more detail below in Section 2.5 and the ‘what if’ scenario is outlined in more detail in Section 2.6. The base case assumptions are summarised in Table 2-1.

**TABLE 2-1: SUMMARY BASE CASE ASSUMPTIONS**

	<b>Australian average</b>	<b>Indigenous people</b>
Population	Life expectancy increases based on historical average for last 100 years	No change in mortality rates so life expectancy constant at current levels
Labour force participation	Constant at current rates	Constant at current rates
Labour productivity	Industry specific AWE increases based on historical average wage inflation rate for the last 10 years	Gap between Indigenous and Australian average income, adjusted for full-time/part-time differences and, increasing at 0.4% per annum based on increase in historical disparity in income over the 5 years to 2001, applied to Australian average AWE.

AWE= average weekly earnings.

In the 'what if' scenario, the life span of Indigenous Australians is gradually increased over time so that it matches the Australian average by 2026. Indigenous labour force participation and labour productivity also gradually increase to match the Australian average by 2026. The modelled 'what if' scenario is summarised in Table 2-2.

**TABLE 2-2: SUMMARY OF WHAT WAS MODELLED (THE 'WHAT IF' SCENARIO)**

<b>Benchmark</b>	<b>Change</b>	<b>Indicator</b>
Average Australian life expectancy in 2026	Indigenous life expectancy matches the benchmark by 2026	Australian average annual population growth rate
Average Australian labour force participation rates in 2026	Indigenous labour force participation rates match the benchmark by 2026	Australian wide average industry specific labour force participation rates
Average Australian labour productivity in 2026	Indigenous labour productivity matches the benchmark by 2026	Australian average industry specific AWE (increasing at rate of annual wage inflation)

AWE= average weekly earnings.

## 2.4 MODELLING APPROACH

The modelling approach is based on a combination of two forecasting constructs. The first is an excel-based model used to predict the impact of changes in the prescribed parameters on a range of macroeconomic indicators (relating to the entire population) over a 20 year time horizon (refer to Table 2-2 for details). The impact on each macroeconomic indicator is expressed as the difference between the base case (or 'status quo') and the 'what if' scenario annualised forecast results. The Indigenous population 'what if' forecast is based on a basic linear model (or constant annual growth rate) over the 20 year time horizon.

The resultant annual changes in each of the three macroeconomic indicators are then used as inputs into AE-GEM (Access Economics - General Equilibrium Model). AE-GEM is a large scale, dynamic, multi-region, multi-commodity computable general equilibrium model of the world economy, with an explicit representation of the Australian economy. The model projects changes in macroeconomic aggregates, such as GDP, employment, export

volumes, investment and private consumption, and sectoral aggregates, such as output, exports, imports and employment. Using AE-GEM, we estimate the deviation from a business-as-usual scenario of the changes in the three macroeconomic indicators listed in Table 2-2.

## 2.5 BASE CASE DEFINED IN DETAIL

### 2.5.1 POPULATION

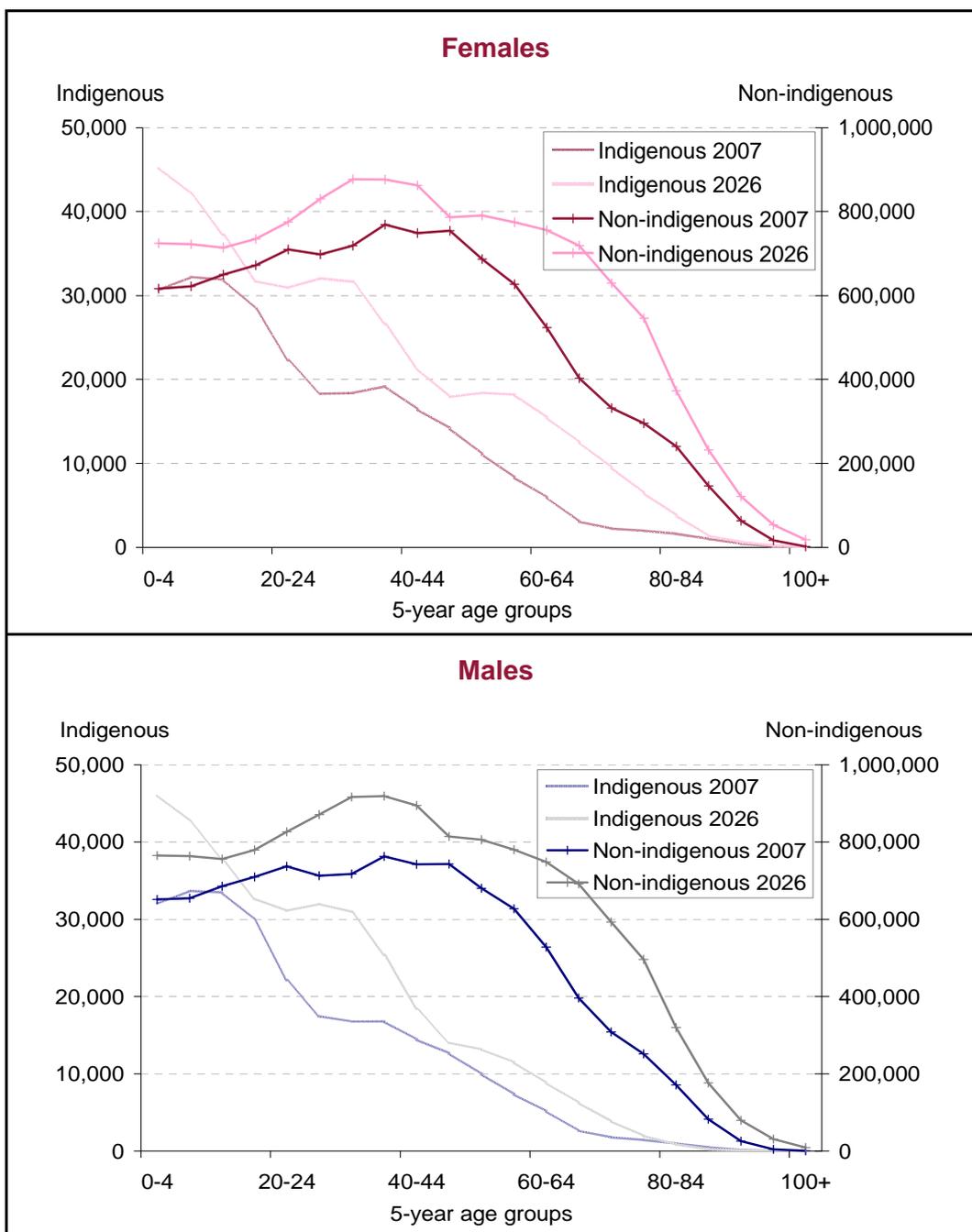
Access Economics collects historical data from ABS publications which it uses to forecast both total Australian and Indigenous Australian population by age. The Access Economics demographic model (AE-DEM) is updated quarterly utilising a dynamic modelling approach, and based on historical national level data, relating to:

- ❑ fertility rates;
- ❑ life expectancy from birth;
- ❑ age specific mortality distributions; and
- ❑ international migration rates.

The Access Economics Indigenous demographic model (AE-DEM-I) incorporates the same dynamic methodology, and is based on the fertility, mortality rates, and life expectancy of Indigenous Australians. Since there is a paucity of data relating to Indigenous international migration rates, the model has assumed zero Indigenous international migration. While this may appear to be an underestimation of the actual trends, we do not expect this assumption to be influential in the overall results.

Chart 2-1 presents gender specific population age distributions for the base case as at 30 June 2007 and 30 June 2026. The Indigenous population declines markedly with age, despite Indigenous historic and forecast fertility rates exceeding those of non-Indigenous people. The difference reflects higher mortality rates and lower life expectancy of Indigenous people than other Australians. Overall, at 30 June 2007, Indigenous Australians accounted for 2.5% of the Australian population (2.5% of Australian males and 2.5% of Australian females). By 30 June 2026, in the base case, Indigenous people account for 3.0% of the Australian population (2.7% of Australian males and 3.0% of Australian females). The greater discrepancy between the relative proportions of Indigenous males and females reflects gender differences in the life expectancy of Indigenous people.

**CHART 2-1: INDIGENOUS AND NON-INDIGENOUS POPULATION DISTRIBUTIONS, 2007 AND 2026 — THE BASE CASE**



Source: AE-DEM

In the base case, the comparatively high fertility rate and low life expectancy of Indigenous Australians results in a relatively young and dependent Indigenous population cohort.

- ❑ At 30 June 2007, the median age of the national population was 35.8 years (38.9 by 30 June 2026) compared with only 20.2 years (24.2 by 30 June 2026) for Indigenous people.
- ❑ At 30 June 2007, the dependency ratio (the population aged less than 16 years plus those over 64 years as a proportion of the working age population — 16 to 64 years) was around 51% for all Australians compared to around 77% for Indigenous Australians.

## 2.5.2 LIFE EXPECTANCY AT BIRTH

Historical life expectancies for both the Indigenous population (ABS 2004a) and total Australian population (ABS 2004a) were obtained from the ABS.

- ❑ In the base case, there is no change in the mortality rates for the Indigenous population during the entire projection period, consistent with ABS (2004a). This means that the estimate of Indigenous life expectancy at birth is projected to be constant at the 1996–2001 level (ABS 2004).
- ❑ For the total population, the ABS has data going back 100 years relating to life expectancy at birth. Over the past century, male and female life expectancy at birth has increased by 23.5 years and 24.7 years respectively. These trends are allowed for in the forecast model, in line with ABS medium population projections (i.e. life expectancy increases over time, but the rate of increase falls over time).

### Box 2-3 Justification for the base case assumption of no change in Indigenous life expectancy over the 20 year projection period

An individual's status as an Aboriginal or Torres Strait Islander is not always identified when deaths are registered, resulting in inaccurate assessments of deaths and mortality rates of Indigenous Australians. The ABS estimated that Indigenous age-specific death rates may understate the true rates by as much as 55%. Fluctuations in historical Indigenous mortality rates can be partly attributed to the changing levels of coverage of Indigenous deaths. Given this volatility, historical Indigenous mortality trends should be viewed with caution.

The ABS (2006d) conducted sensitivity analysis on their projections of the Indigenous population for the period 2002 and 2009 under different mortality assumptions, all else equal. The base case was no change in mortality rates (constant over time). The ABS (2006d) concluded that a reduction in mortality rates that resulted in an annual improvement in Indigenous life expectancy at birth of 0.25 years would have only a minimal impact on the projected Indigenous population in 2009. Since there are no reliable data with which to inform Indigenous life expectancy growth forecasts, and consistent with the ABS (2006d), the assumption of no change in life expectancy at birth is employed for this analysis.

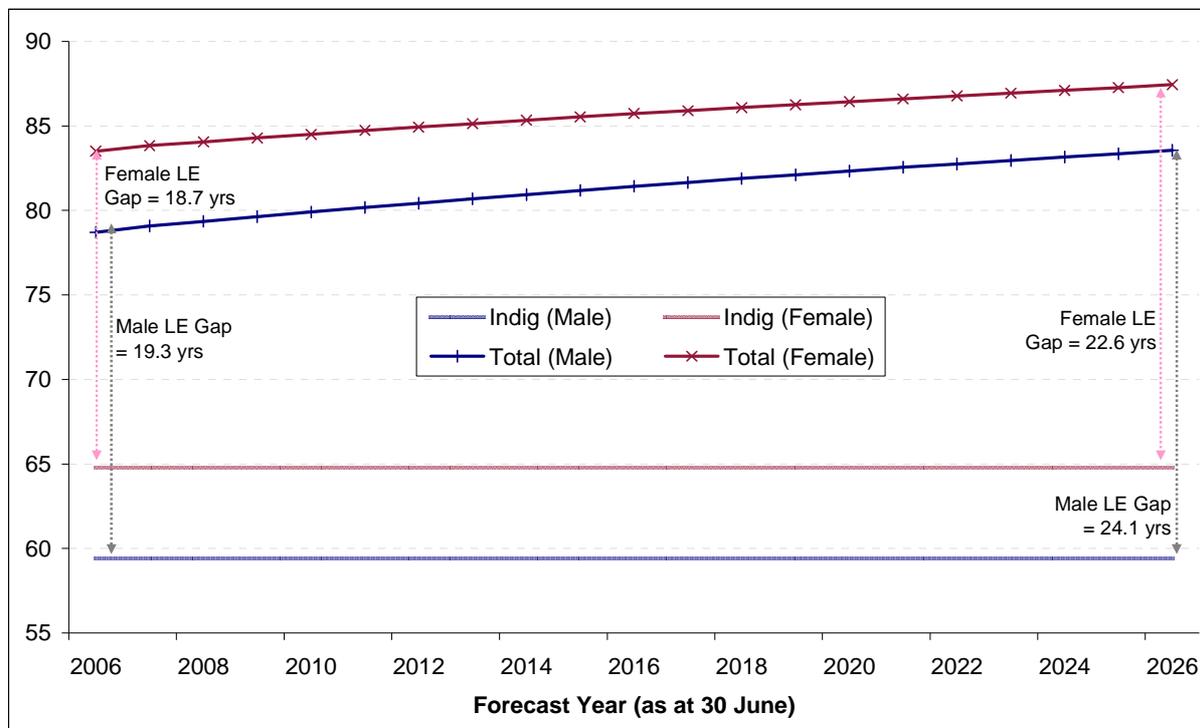
ABS (2004a) estimated the life expectancy at birth for people of Indigenous origin born in the period 1996-2001 was 59.4 years for males and 64.8 years for females. The ABS (2004a) compared this with the life expectancy for all Australian males and females of 76.2 years and 81.8 years respectively for persons born in the period 1997–1999 and 77.4 years and 82.6 years respectively for persons born in the period 2000–2002. The ABS (2004) concluded that,

*This indicates that the life expectancy of Indigenous population is approximately 18 years less than that of the total Australian population (ABS 2004a:15).*

For this project, while as previously discussed, the life expectancy at birth of Indigenous Australians is assumed constant and based on the life expectancy at birth for people of Indigenous origin born in the period 1996-2001, the life expectancy at birth for all Australians is updated to more recent ABS estimates. For all Australian males and females, the ABS (2006b) estimated that life expectancy at birth for those born in the period 2004-2006 was 78.7 years and 83.5 years respectively. Based on these updated data, in 2007, the gap in

life expectancy between Indigenous people and all Australians is approximately 19 years (Chart 2-2). The reasons for differences in estimates of the life expectancy gap between Indigenous Australians and all Australians are discussed in more detail in Appendix B.

**CHART 2-2: FORECAST LIFE EXPECTANCY AT BIRTH BY GENDER AND POPULATION GROUP — BASE CASE**



Source: AE-DEM

### 2.5.3 LABOUR FORCE PARTICIPATION

Labour force participation is defined as people working or willing to work aged 15 to 64 years old. AE-GEM provides for a split by industry.

Estimates of Indigenous labour force participation suggest that in the three years to 2005, Indigenous participation grew 3.6%, whereas the national average grew 5.7%. However, in the 10 years to 2005, Indigenous labour force participation decreased by 1.0%. Implying, as expected, that labour force participation is closely linked to the positioning of economic and business cycles at the time. It is therefore reasonable to assume in the base case that, for both the Indigenous and national average, labour participation rates are constant over time. Estimates of 2004-05 labour force participation rates were obtained from SCRGSP (2007) (Table 2-3). In the base case, labour force participation and productivity estimates are modelled inclusive of CDEP participants, in line with ABS methodology (Box 2-4).

**TABLE 2-3: LABOUR FORCE PARTICIPATION, 2004-05  
AGE STANDARDISED (% POPULATION 15 TO 64)**

	Indigenous	non-Indigenous	National average
Male	67.8%	85.6%	85.2%
Female	50.2%	70.7%	70.3%
Total	58.5%	78.1%	77.7%

Source: SCRGSP 2007, CDEP participants included.

**Box 2-4 Community Development Employment Program (CDEP)**

The Community Development Employment Project (CDEP) is a program for unemployed Indigenous Australians, funded by the Australian Government. The aim is to develop the workplace skills of participants.

The program was to be abolished in mid-2008, but the new Government placed a moratorium on dismantling it in December 2007. CDEP has already been wound up in urban and regional centres, where it had a relatively minor role. However, CDEP remains significant in remote and very remote areas. In 2004-05, CDEP accounted for 68.0% of Indigenous employment in 'very remote' areas (SCRGSP 2007:11.6). There were 34,775 CDEP participants as at 30 June 2005 (SCRGSP 2007:3.43).

Some CDEP programs provide essential services such as health care and education (SCRGSP 2007 p.41). Categorisation of CDEP for the purposes of defining the labour force is therefore difficult. The ABS includes CDEP participants in estimates of the labour force and employment.

**2.5.4 EMPLOYMENT**

To derive employment rates, the labour force participation rates were adjusted for unemployment using Access Economics' *Business Outlook* (2008), which publishes forecasts of average Australian unemployment rates to 30 June 2017. The unemployment rate for the remainder of the projection period (2017 to 2026) was assumed constant at the 4.4% 2017 forecast rate.

An Australian average unemployment rate was derived based on a weighted average of the Indigenous and non-Indigenous rates (96%) using comparative data from SCRGSP (2007). The ratio of employed Indigenous labour force to employed national labour force is used to adjust national and Indigenous unemployment over time.

Employment estimates were then adjusted for differences between the Indigenous and Australian full-time/part-time work split. Indigenous and non-Indigenous employment rates by full-time versus part-time as at 30 June 2005 were based on SCRGSP (2007). The method is illustrated in Box 2-5.

### Box 2-5 Method for calculating full-time equivalent employment (FTE) estimates

In 2005, 40% of employed Indigenous people worked part-time (SCRGSP 2007). These data are assumed constant throughout the forecast period.

Projections for this report suggest 176,161 Indigenous people will be employed in 2009, of which 19,828 will be participating in CDEP. (CDEP participant numbers were not able to be adjusted for hours worked so are effectively treated as full-time equivalents.) FTE employment levels for the remainder of the work force were estimated on the basis that a part-time worker works half as many hours as a full-time worker. (This assumes that part-time hours per week are distributed normally.) The calculation is therefore:

$$(176,161 - 19,828) \times (0.5 \times 40\% + 1.0 \times 60\%) = 125,219$$

The estimate of total FTE Indigenous employment is 145,047, including CDEP participants. (Note that the calculation does not reconcile exactly due to rounding.)

## 2.5.5 LABOUR PRODUCTIVITY

As indicated in Section 2.3, the difference between the Average Weekly Earnings (AWE) of Indigenous and non-Indigenous people — adjusted for differences in hours worked — is used as an indicator of the difference in labour productivity.

ABS 2001 Census data (ABS 2003) were used to estimate the difference between Indigenous and Australian average AWE by occupation<sup>3</sup> (Table 2-4). The estimates were adjusted to reflect the proportions of full-time and part-time employment to derive a 'relative FTE income ratio' by occupation (Table 2-4). Notably:

*Between 1996 and 2001, average equivalised gross household income for Indigenous persons rose by about 11% (after adjustment for inflation using the Consumer Price Index) compared with 13% for non-Indigenous persons.' (ABS 2003)*

Therefore, the model assumes a per annum increase in the relative (Indigenous versus national average) income gap of 0.4% (or 2 percentage points over 5 years). This factor is applied to the 2001 income ratios to achieve income ratios for 2006.

<sup>3</sup> The income measure used to identify the gap in income is gross individual income per week for employed people. While the measure is before tax and other deductions and may include welfare payments that top up the incomes of employed people, the scope is the same for both Indigenous and non-Indigenous people. The ABS (2003) defined this measure as: the usual gross weekly income of persons aged 15 years or over. Gross weekly income is income before tax, superannuation, health insurance, or other deductions are made, and includes family payments, pensions, unemployment benefits, student allowances, maintenance (child support), superannuation, wages, overtime, dividends, rents received, interest received, business or farm income (less operating expenses) and workers' compensation received.

**TABLE 2-4: RELATIVE INCOME RATIOS FOR EMPLOYED PERSONS AGED 15 YEARS AND OVER, MEDIAN GROSS WEEKLY INDIVIDUAL INCOME (A)**

	Indigenous 2001	National Average 2001	Indigenous 2001 (adj) (B)	National Average 2001 (adj) (B)	Income Ratio 2001	Income Ratio 2006
Managers and administrators	\$740	\$912	\$1,035	\$1,176	88%	86%
Professionals	\$639	\$876	\$893	\$1,130	79%	77%
Associate professionals	\$606	\$695	\$847	\$896	95%	93%
Tradespersons and related workers	\$492	\$596	\$688	\$769	89%	87%
Advanced clerical and service workers	\$537	\$582	\$751	\$751	100%	98%
Intermediate clerical, sales and service workers	\$443	\$503	\$619	\$649	95%	93%
Intermediate production and transport workers	\$521	\$567	\$728	\$731	100%	98%
Elementary clerical, sales and service workers	\$302	\$319	\$422	\$411	103%	101%
Labourers and related workers	\$238	\$420	\$333	\$542	61%	59%
Not stated/Inadequately described	\$247	\$482	\$345	\$622	56%	54%
<b>Total</b>	<b>\$431</b>	<b>\$587</b>	<b>\$603</b>	<b>\$757</b>	<b>80%</b>	<b>78%</b>

(A) See footnote 3.

(B) Adjusted to FTE earnings based on employment type breakdown and a 0.5 weighting on part-time workers (refer to Section 2.5.4 for explanation).

Source: ABS 2003. Data is inclusive of CDEP participants.

The AWE ratios for occupations are applied to each industry on a weighted average basis (using ABS 2001 Census estimates of employment by occupation in each industry) (Table 2-5) to obtain industry specific AWE estimates for 2006. Indigenous AWE estimates by industry are estimated as the product of the Australian AWE estimates by industry and the AWE Indigenous income ratios by industry.

**TABLE 2-5: INDUSTRY SPECIFIC WEIGHTINGS BY TYPE OF OCCUPATION**

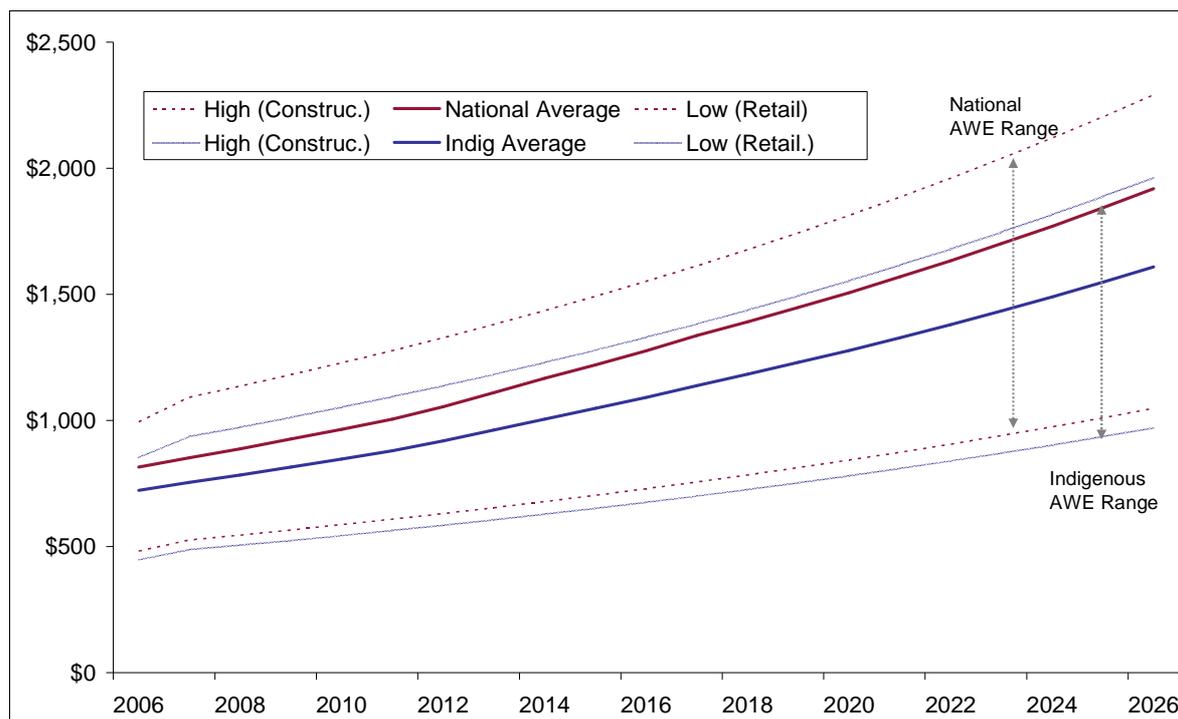
	Gov't & Defence	Personal & Other Services	Construc	Manuf	Retail	Property & Business Services	Other	Total
Managers and administrators	10%	4%	10%	12%	4%	8%	11%	9%
Professionals	22%	12%	3%	9%	3%	34%	24%	18%
Associate professionals	14%	21%	7%	5%	14%	15%	12%	12%
Tradespersons and related workers	8%	23%	48%	25%	13%	3%	5%	12%
Advanced clerical and service workers	3%	3%	5%	3%	2%	9%	3%	4%
Intermediate clerical, sales and service wc	26%	15%	4%	9%	10%	11%	22%	16%
Intermediate production and transport wor	4%	5%	9%	17%	7%	2%	8%	8%
Elementary clerical, sales and service wor	6%	9%	1%	2%	40%	6%	5%	10%
Labourers and related workers	6%	8%	12%	16%	6%	10%	7%	9%
Not stated/Inadequately described	2%	1%	1%	1%	0%	1%	1%	1%
Total	0%	0%	0%	0%	0%	0%	2%	1%

Source: ABS 2001 Census employment by occupation by industry

Two methods were used to obtain forecasts, as detailed below.

- ❑ Australian-average AWE historical trends by industry were sourced from the ABS (ABS 2008a). Forecast Australia average industry specific AWE were then based on the historical data being inflated by the average annual wage inflation rate over the last 10 years.
- ❑ The quarterly Access Economics *Business Outlook* report (2008) publishes forecast Australian average AWE over a 10 year time horizon (to 30 June 2017). These forecasts are reconciled against the industry specific Australian average AWE forecasts defined in the previous bullet point. The 'Other industries' sector, a conglomerate of a number of ABS industry definitions, is used as the balancing item.

**CHART 2-3: COMPARISON OF RANGE OF INDUSTRY SPECIFIC AVERAGE WEEKLY EARNINGS**



Source: AE Indigenous Supply Model

## 2.6 THE 'WHAT IF' SCENARIO DEFINED IN DETAIL

As summarised in Table 2-2, the modelling aims to assess the impact of increasing the life span, labour force participation rates and labour productivity of Indigenous people to match that of the Australian average by 2026.

### 2.6.1 POPULATION

To achieve longer life spans for Indigenous people, AE-DEM was used to generate projections of the Indigenous population by adjusting Indigenous male and female age specific mortality rates so that they reflected the Australian average.

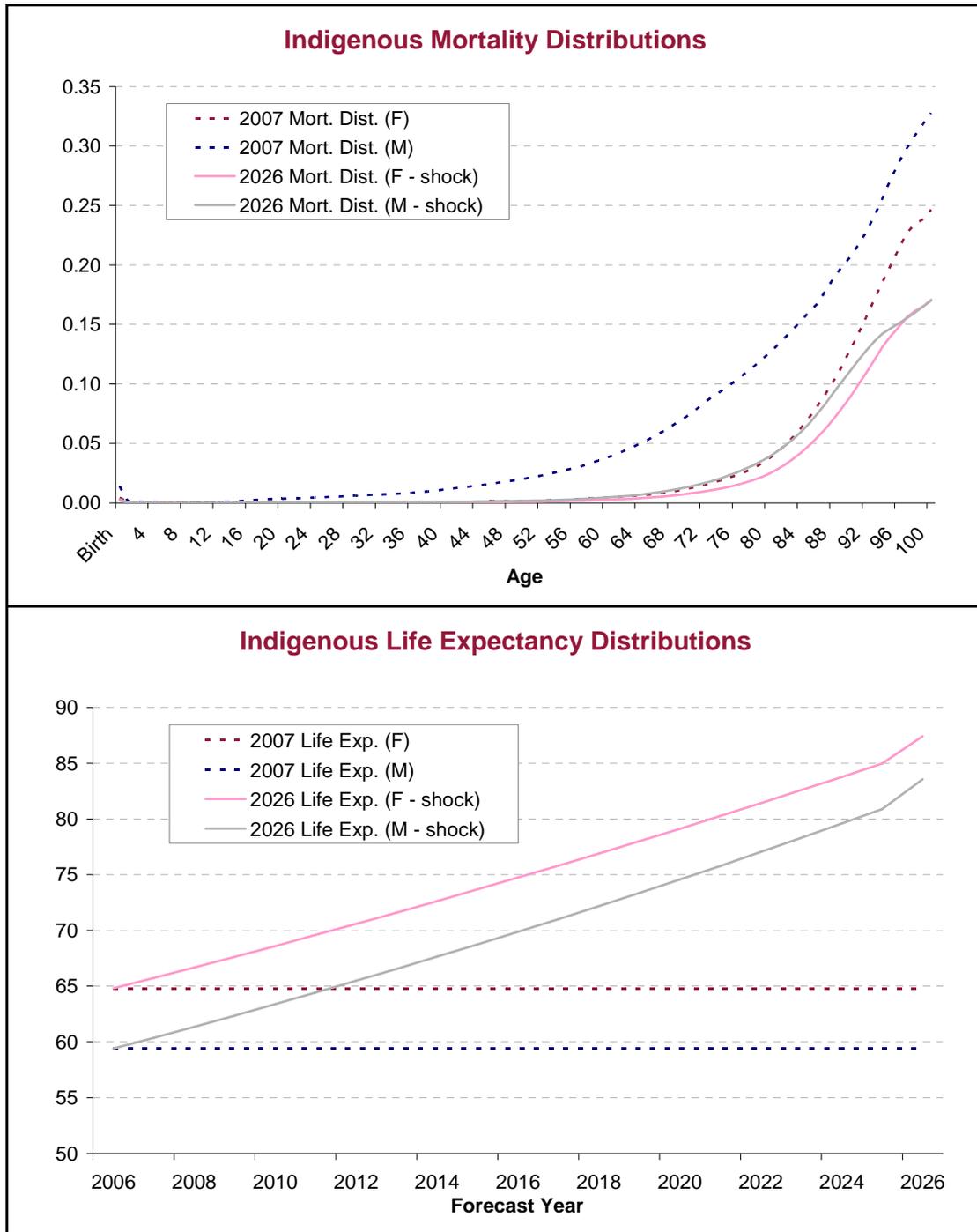
The increase in the life expectancy of Indigenous Australians means that by 2026, there are 36,750 more Indigenous people in the 'what if' scenario compared with the base case. The average annual 'what if' population growth rate (1.84%) is 0.2 percentage points higher than that of the base case (1.66%). Table 2-6 summarises the differences in populations between the base and 'what if' scenario cases. To put these changes in the Australian population in context, AE-DEM forecasts of increases in the Australian population due to international immigration (based on historical estimates) for 2006 are 146,753 and for 2026 are 171,664.

**TABLE 2-6: INDIGENOUS AND AUSTRALIAN POPULATIONS COMPARED (NUMBER OF PEOPLE)**

Year	Base case		'What if' scenario		Difference
	Indigenous	Total Australian	Indigenous	Total Australian	
2007	527,196	21,017,222	527,347	21,017,373	151
2026	761,289	26,719,230	798,038	26,755,979	36,749

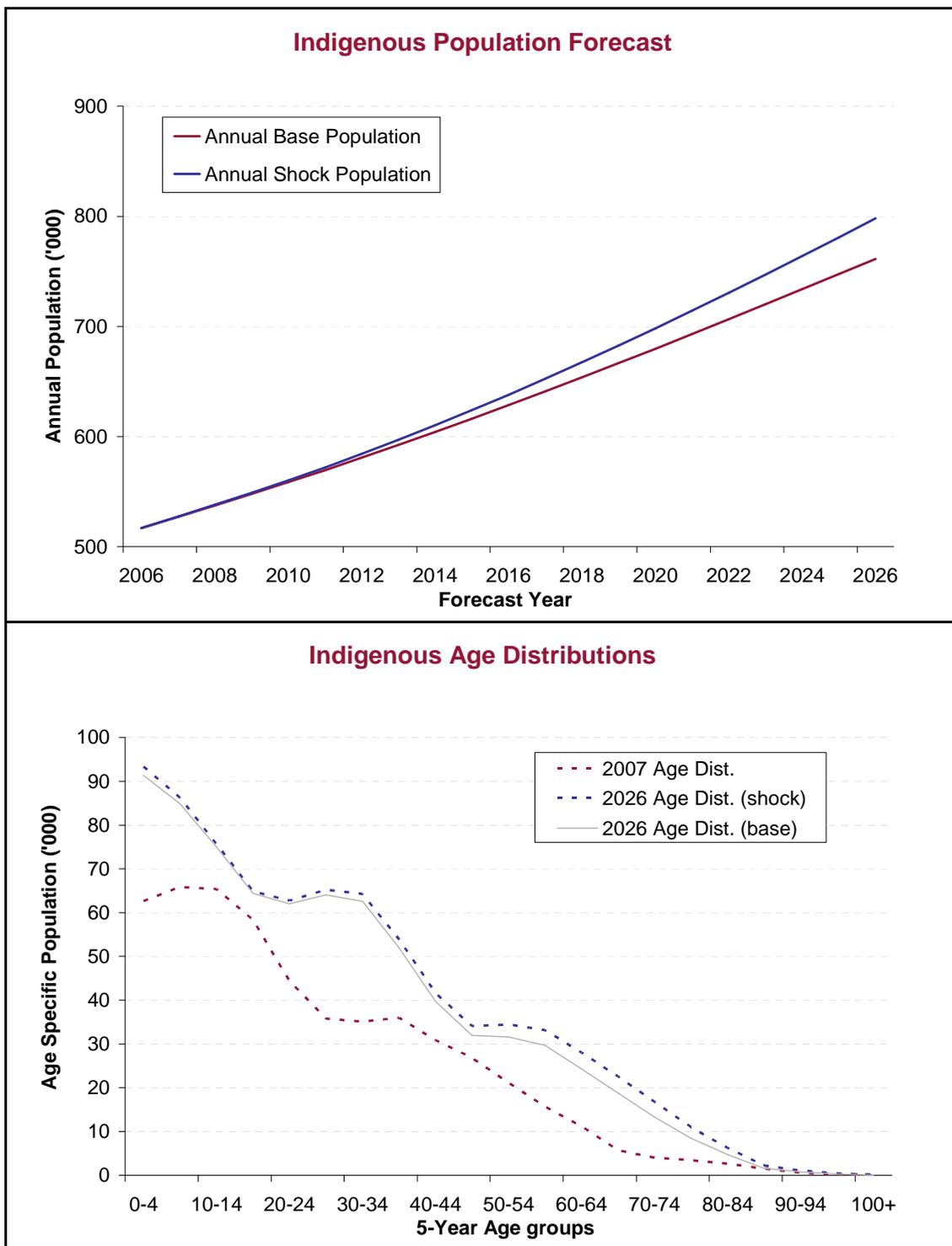
Source: AE-DEM

**CHART 2-4: INDIGENOUS LIFE EXPECTANCY AND MORTALITY DISTRIBUTIONS, 2007 AND 2026**



Source: AE-DEM

**CHART 2-5: 'WHAT IF' SCENARIO INDIGENOUS POPULATION FORECAST AND CHANGE IN AGE DISTRIBUTION**



Shock series represents the 'what if' scenario — the impact of both the life expectancy and labour force participation rate

### 2.6.2 LABOUR FORCE PARTICIPATION

The increase in Indigenous labour force participation rates, combined with the rise in Indigenous life expectancy, means that by 2026, there are 104,072 more Indigenous people in the labour force in the 'what if' scenario compared with the base case. The average

annual 'what if' scenario population growth rate (1.22%) is 0.01 percentage points higher than that of the base case (1.23%). Table 2-7 summarises the differences in the number of people in the labour force between the two cases.

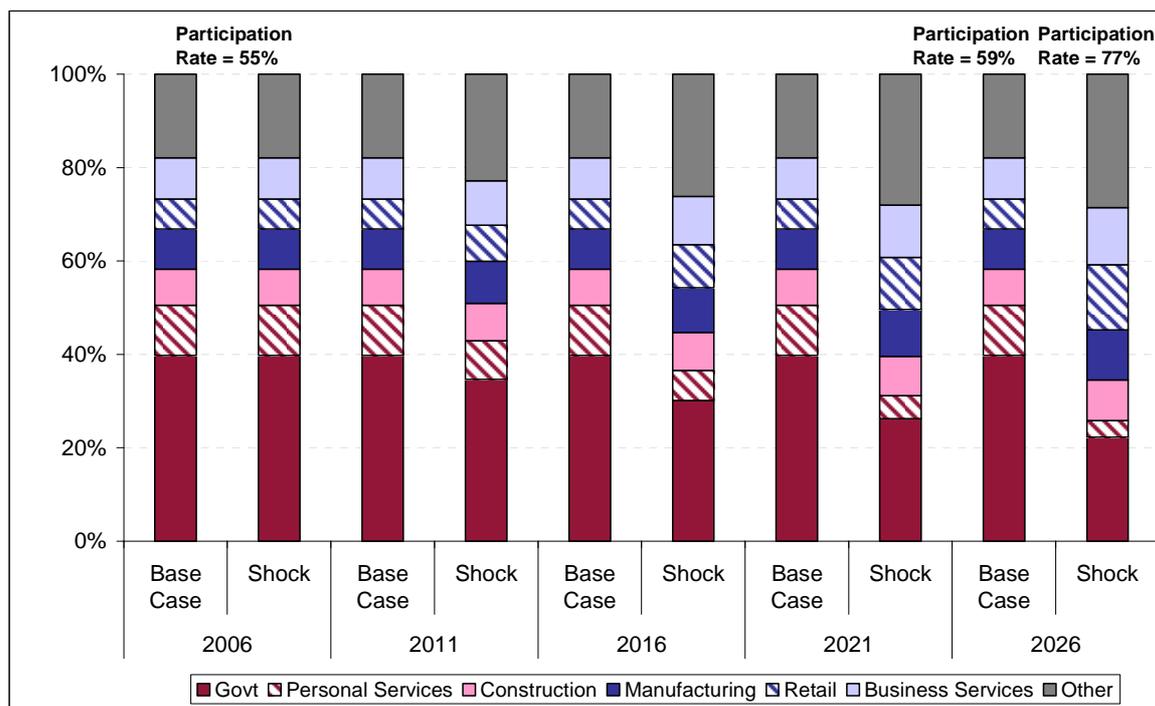
**TABLE 2-7: INDIGENOUS AND AUSTRALIAN LABOUR FORCE COMPARED (NUMBER OF PEOPLE)**

Year	Base case		'What if' scenario		Difference
	Indigenous	Total Australian	Indigenous	Total Australian	
2007	185,086	11,028,894	187,614	11,031,422	2,528
2026	270,303	13,051,123	374,375	13,155,195	104,072

Source: AE-DEM and calculations by Access Economics.

Chart 2-6 shows the differences in the base case and 'what if' scenarios. In particular, note the different distribution of employment by industry in 2026. In the model, the proportion of Indigenous people employed in the government sector and in the personal services industry is lower than in the base case, and the proportion employed in construction, manufacturing, retail trade and business services sectors is higher (reflecting the distribution for all Australians).

**CHART 2-6: 'WHAT IF' SCENARIO ON EMPLOYED INDIGENOUS PARTICIPATION BY INDUSTRY**



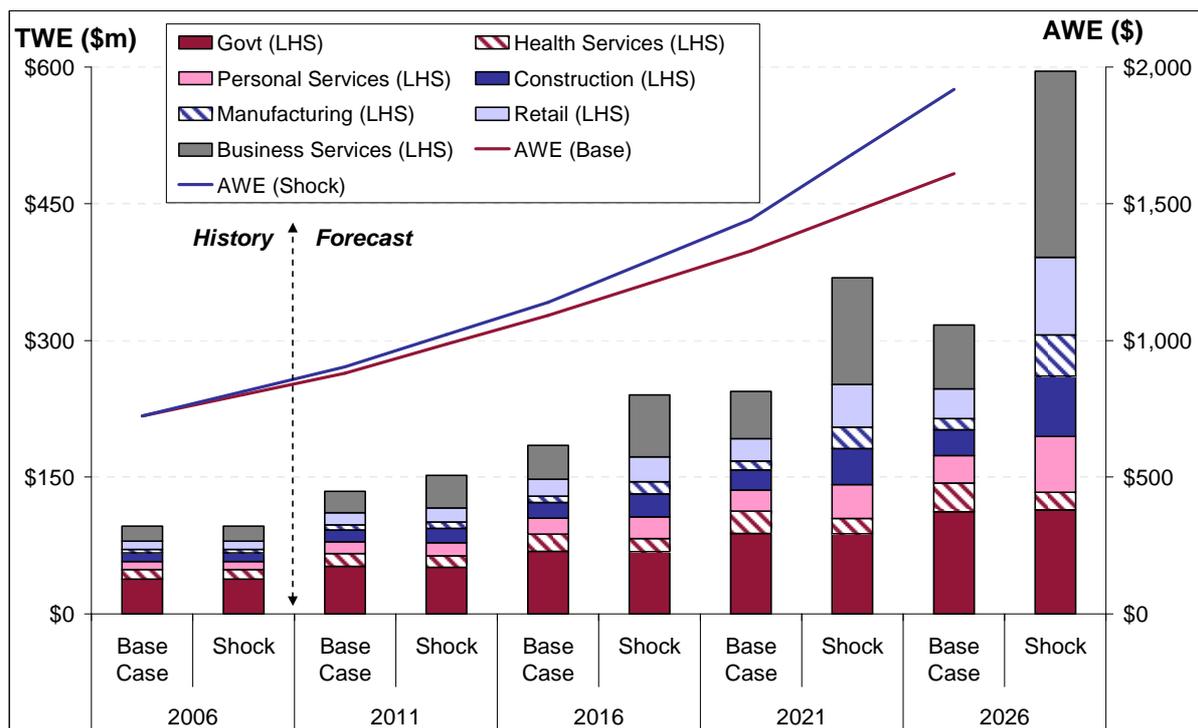
'Other' industries include mining, wholesale trade, utilities, transport and storage, and communication services.

Shock series represents the 'what if' scenario — the impact of both the life expectancy and labour force participation rate

### 2.6.3 LABOUR PRODUCTIVITY

Given all targets are achieved by 2026, the estimated Total Weekly Earnings (TWE) for the Indigenous population in 2026 will have exceeded the base case by \$26.8 million (in 2026 dollars).

**CHART 2-7: CHANGE IN TOTAL WEEKLY INDUSTRY EARNINGS AND AVERAGE WEEKLY EARNINGS**



The Shock series represents the ‘what if’ scenario — the impact of life expectancy, participation rates, and AWE shocks.

Total Weekly Industry Earnings (TWE) is estimated by AWE and participation numbers for each industry.

**Mini sensitivity analysis found that ...**

- As part of the model it is assumed that the distribution of Indigenous employment by industry matches that of the national average by 2026. Sensitivity analysis was undertaken to test the impact of leaving the distribution of Indigenous employment by industry the same in 2026 as it was in 2006. There was no appreciable impact on the results.

**2.7 CALCULATED MODEL INPUTS**

Table 2-8 details the annual growth rates in the Australian population, the labour force and labour productivity in the base case, and those required to achieve the ‘what if’ scenario benchmarks (see Table 2-2). The ‘deltas’ are the differences in annual growth rates between the base case and ‘what if’ scenario. These are the inputs for the AE-GEM modelling.

**TABLE 2-8: INPUTS FOR AE-GEM MODEL**

Labour force, life expectancy and Income shock impact analysis	Current Status	Shock Status	Delta	Current Status	Shock Status	Delta
Annual population growth rate	1.22%	1.23%	0.01%			
<b>Industry Annualised Data</b>	<b>Employed Labour supply growth p.a.</b>			<b>Wage inflation growth on AWE p.a.</b>		
Government, Defence, Health & education	0.9%	0.9%	-0.02%	3.3%	3.3%	0.02%
Personal and Other Services	0.9%	0.8%	-0.13%	3.5%	3.5%	0.03%
Construction	0.9%	1.0%	0.06%	4.1%	4.1%	0.01%
Manufacturing	0.9%	1.0%	0.07%	3.4%	3.4%	0.01%
Retail Trade	0.9%	1.0%	0.10%	3.8%	3.8%	0.00%
Property and Business Services	0.9%	1.0%	0.07%	4.4%	4.4%	0.01%
Other Industries	0.9%	1.0%	0.08%	5.1%	5.1%	0.01%
<b>Total</b>	<b>0.9%</b>	<b>1.0%</b>	<b>0.05%</b>	<b>4.2%</b>	<b>4.2%</b>	<b>0.01%</b>

Source: Calculations by Access Economics

## 2.8 RESULTS

The modelling here suggests that Australians forego substantial economic benefits as long as Indigenous disadvantage continues. The results in Table 2-9 show the cumulative percent changes (the sum of the annual changes) in the macroeconomic indicators by 2029 in the 'what if' scenario compared with the base case. In aggregate, the modelling suggests improvements in Indigenous life expectancy, labour force participation rates and labour productivity will result in significant improvements to GDP and output per head.

**TABLE 2-9: RESULTS OF AE-GEM ANALYSIS<sup>4</sup>**

<b>Macroeconomic Indicator</b>	<b>2029 Shock % Change</b>
Real Gross Domestic Product	0.953
Value-Added Productivity	0.142
Capital Stock	0.556
Employment	1.012
Consumer Price Index	-0.174
Real Household Consumption	0.835
Population	0.210
Labour Supply	0.783
Indirect Tax Base	0.847
Real Government Consumption	1.202
Real Investment	1.059
Real Exports	0.703
Real Imports	0.660
Terms of Trade	-0.153
Rate of Return on Capital	0.535
Government Price Index	-0.513
Real Wage	-0.167

- ❑ Real GDP will be around 1% higher than otherwise in 2029. In the absence of forecasts of GDP to 2029, 1% of GDP in 2008-09 is around \$10 billion.
- ❑ Further, since the percentage change in GDP is greater than the percentage change in the population (which is 0.2% higher in 2029), living standards (measured in terms of output per head) also rise.
- ❑ Real wages per person will be lower in 2029, by around 0.2%. This outcome arises as there is a large increase in the total labour supply, but a smaller increase in total labour productivity. This smaller increase means productivity per worker falls and, therefore, real wages also fall. Although wages per person fall, total wages paid to workers will increase.

Realisation of the economic benefits is predicated on a higher proportion of the Indigenous population in paid work, able to take on higher skilled and better paid work and working

<sup>4</sup> Most of the indicators improve except the terms of trade, the consumer price index, and the government price index. Since Indigenous employment and earnings are higher than otherwise, real household consumption is also higher (0.86%). While imports are consequently higher (0.69%), the price of imports is unchanged (ie. the world price). On the other hand, the supply of exports increases (0.77%) and the price of Australian exports falls, reducing the terms of trade (0.26%). The rate of expansion in the labour force, together with improvements in labour productivity outweigh increases in demand, so the Consumer Price Index (CPI) is 0.26% lower than otherwise. The government price index is lower than otherwise for similar reasons to the CPI, except that labour costs are a higher proportion of the government sector than other industries.

full-time rather than part-time. Improvements in the health and educational attainment of Indigenous people are fundamental to achieving these results.

### 2.8.1 STATIC VERSUS DYNAMIC

We have undertaken a simplified analysis comparing two points in time based on linear growth patterns in all variables. In particular, we have not attempted to explain how the end point is achieved. As discussed in the next chapter, policies, programs, skills and resources will be required to assist Indigenous Australians to overcome the disadvantages they face. Box 3-2, Box 3-3, and Box 3-4 illustrate the types of analyses and actions required at a micro level and the complex nature of the likely interventions needed.

### 2.8.2 REGIONAL EFFECTS

Regional (geographic) effects — which are relatively important for analyses of Indigenous populations — were not in scope for this project. It is possible that under the scenario modelled, the expansion in the Indigenous labour supply and improvement in labour productivity may ameliorate labour shortages in regional areas, and contribute to economies of scale in some smaller regional cities.

### 2.8.3 INCOME DISTRIBUTION

While distributional effects are not specifically modelled, an increase in the labour supply and employment rate of Indigenous Australians enhances their ability to share in economic prosperity.

However, the implicit modelling assumption is that income distribution improves because Indigenous educational attainment and employment rates improve.

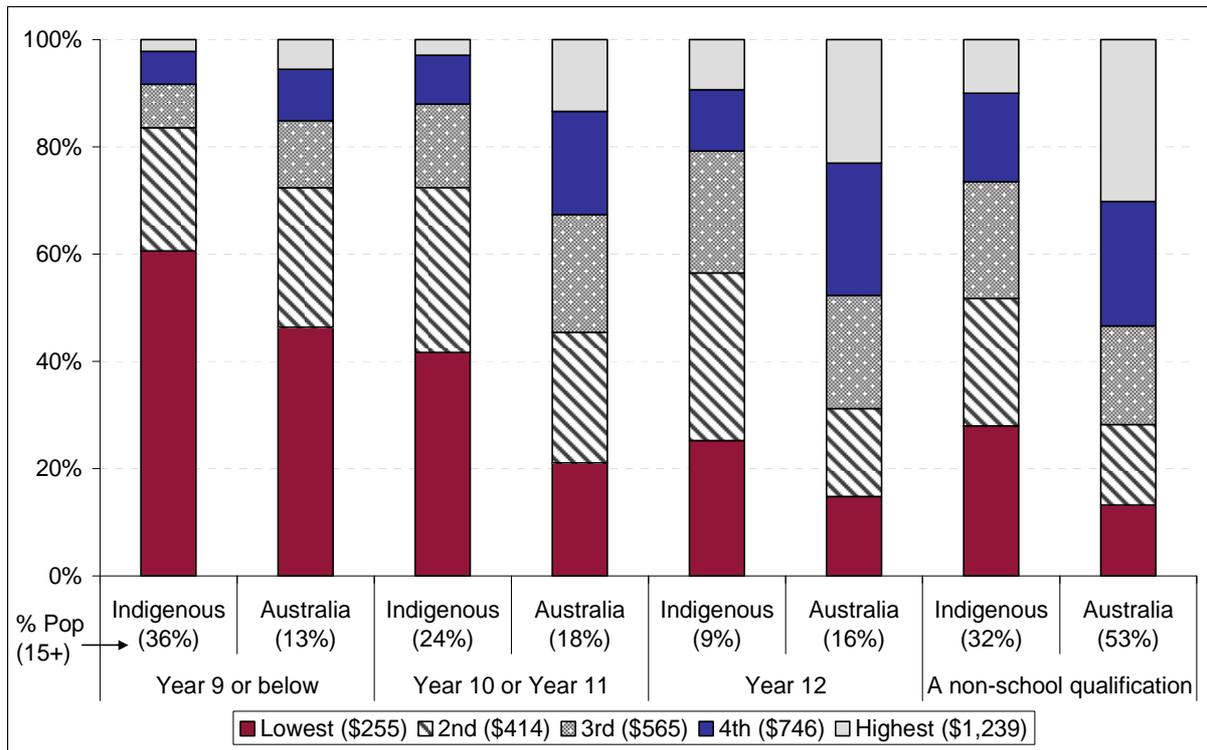
Chart 2-8 details the current quintiles of mean equivalised gross household income per week distributed across levels of educational attainment, for both the Indigenous and the total Australian population (for the year 2005-6). At every grouping of highest educational attainment level, a higher proportion of the total Australian population achieves the highest income quintile than the Indigenous population. For example, in the highest household income quintile, the equivalised mean<sup>5</sup> is \$1,239 (as at 2005-06, ABS 2007a). At the non-school qualification level (i.e. tertiary education, vocational employment training, apprenticeships etc.), 30% of the total population achieves the highest income quintile, compared to only 10% of the Indigenous population. A reverse trend is observed in the lower income quintiles (i.e. higher comparative Indigenous weightings).

Chart 2-9 analyses the change in the current income quintile breakdown by educational attainment level should the indigenous population reach an equivalent breakdown by 2026 to that of the Australian average. In order for the Indigenous population to reach the Australia wide trends, the Indigenous per annum mean equivalised household income growth rate will need to increase by 1.16 percentage points (from 2.42% p.a. base case to 3.58% p.a. 'what if' scenario). At an aggregated level, the change to the overall national average weekly income growth rate is 0.02 percentage points (from 2.39% p.a. base case to 2.41% p.a. 'what if' scenario).

---

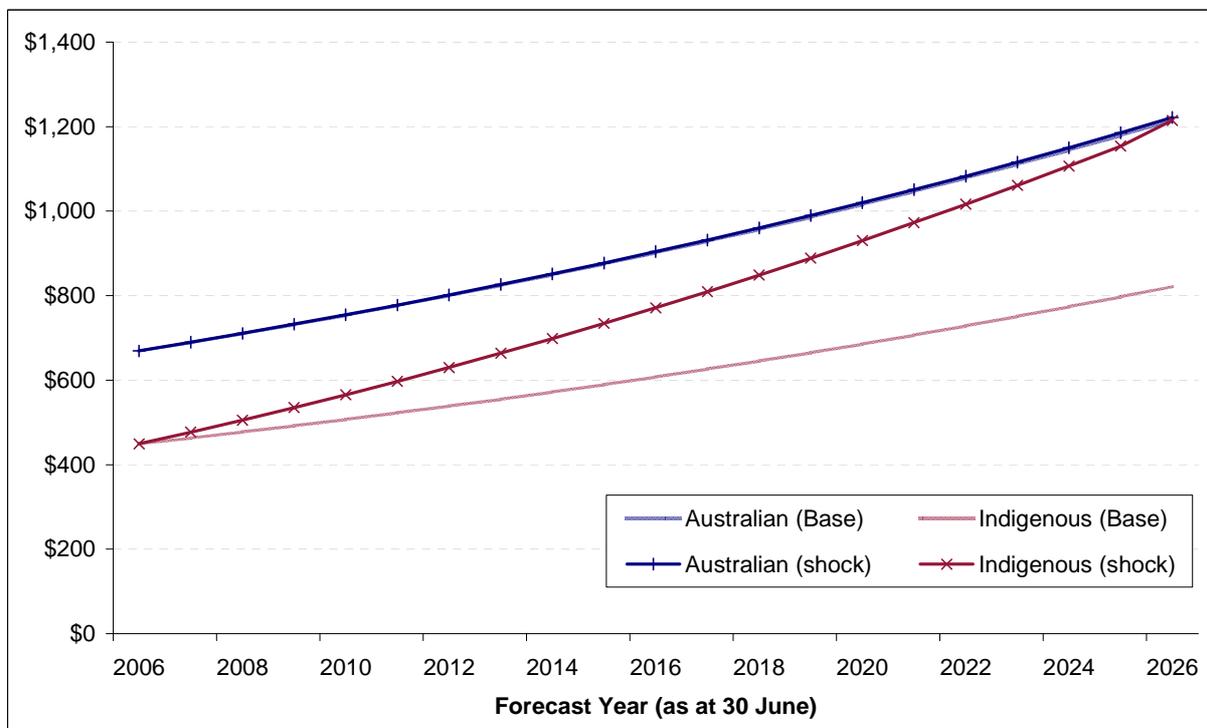
<sup>5</sup> An equivalised mean corresponds to a single individual's mean gross income (i.e. household income is divided by the number of people over 15 years of age in the household).

**CHART 2-8: COMPARATIVE POPULATIONS' INCOME QUINTILE\* DISTRIBUTION BY HIGHEST EDUCATIONAL ATTAINMENT LEVEL**



Source: SCRGSP 2007 and ABS 2007a. \*Estimated by mean equivalised gross household income per week, 2005-06 values per income quintile displayed in legend.

**CHART 2-9: AVERAGE WEEKLY INCOME BASED ON HIGHEST LEVEL OF EDUCATIONAL ATTAINMENT AND EQUIVALENT INCOME PROFILES**



Source: Calculations by access economics based on SCRGSP 2007 and ABS 2007a.

### 3. A CHANGE IN THE STRUCTURE OF GOVERNMENT BUDGETS

In this chapter, the impact on government budgets of matching the life expectancy and other characteristics of Indigenous people with the national average is discussed. The aim is to project revenue and expenditure in 2029 based on different assumptions about Indigenous life expectancy, labour force participation, labour productivity and expenditure per head for key programs in a number of portfolios. Revenue is discussed first, followed by expenditure. **The methodology is discussed in detail in Appendix A.**

All expenditure and revenue estimates are expressed in 2009 dollars.

#### 3.1 INTRODUCTION

Improvements in life expectancy, labour force participation and productivity of Indigenous people will change the structure of government budgets. For example, *a priori*, it would be expected that:

- ❑ as the participation rates of Indigenous children in school (particularly in the latter years of secondary school) increase to match the Australian average, Australian, State and Territory Government expenditure on school education will increase;
- ❑ extending the life span of Indigenous people will contribute to increased expenditure on ageing related programs, such as the Aged pension and residential aged care; and
- ❑ conversely, if the health of Indigenous Australians reaches a level commensurate with that of all Australians, government expenditure overall on health will fall, largely because government expenditure on hospitals will fall — although Medicare and pharmaceutical outlays are likely to rise.

In a similar but more restricted exercise, Taylor and Hunter (1998) estimated that if the Indigenous unemployment rate was reduced to that of the rest of the population, the savings to government in payments to the unemployed, in 1996 dollars, would be around \$193 million by the year 2001 and \$274 million by 2006 with unemployment bills of \$112 and \$126 million respectively. Tax receipts from achieving parity in labour force status would approximate \$177 million by 2006. Their analysis was based on 1991 and 1996 Census data, with the 1991 data adjusted for changed propensity to identify as Indigenous.

#### Importantly ...

- 1 While improvements in Indigenous life expectancy, labour force participation, and labour productivity over the next 20 years may enhance the budget bottom line in some key mainstream programs, such improvements are only likely to be achieved with additional government outlays on Indigenous-specific or other types of assistance programs. These types of outlays have sometimes been called 'remedial outlays' in the literature. Some examples are discussed in Box 3-2, Box 3-3Box 3-4, and Box 3-3Box 3-4. Some of the key Indigenous-specific programs are noted here, but generally not included as part of the structural changes to government budgets.
- 2 All of the analysis in this chapter assumes other influences on government revenue and expenditure remain constant. This enables analysis of the impact of improving the circumstances of Indigenous people alone. However, over a 20 year period, other factors affecting government budgets are also likely to change.

- 3 Regional (geographic) analysis is out of scope here, however, for various reasons, the structure and efficiency of programs may differ according to the geographic distribution of the recipients. Other factors may also influence the nature of spending within some mainstream programs. For example, an increase in the need to accommodate cultural and other characteristics of Indigenous Australians in program delivery over time if Indigenous people are to access mainstream programs at a greater rate.
- 4 Taxes and government outlays (transfer payments) do not use resources, but simply redistribute the available income. Hence, savings to government budgets do not reflect changes in total population wealth. However, transfer payments are associated with economic costs (called 'deadweight' losses) such as the costs involved in administration of welfare payments systems, and the distortion of individual work and leisure choices attributable to government programs. Deadweight losses are not incorporated in the analysis here.

## 3.2 REVENUE

Forecast changes to several important areas of government revenue are in Table 3-1. All other factors are held constant — in other words, the increased revenue is wholly attributable to reducing Indigenous disadvantage and does not reflect other influences that could also potentially affect government income. All numbers are in 2009 dollars. In 2029, with an improved outlook for Indigenous Australians, government revenue overall (including Australian, State and Territory) is projected to be approximately \$4.6 billion higher than otherwise.

### 3.2.1 INCOME TAX

Income tax is the Australian Government's largest single source of income (with revenue from income tax expected to be \$105.5 billion in 2009 —Table 3-1) and the largest source of revenue gain (\$1.7 billion higher in 2029). After adjusting for the Medicare levy, Family Tax Benefit and Child Care Benefit, the net gain to revenue from personal taxes is around \$1.9 billion. This reflects the higher population, higher employment to population ratio, and shifting across progressive tax brackets in 2029 in the 'what if' scenario compared with the base case.

### 3.2.2 GOODS AND SERVICES TAX (GST)

The most significant source of revenue for State and Territory Governments is the goods and services tax (GST). In the modelled scenario, in 2029 GST revenue is projected to be \$530 million higher than otherwise, reflecting higher household consumption. The AE-GEM forecasts suggested household consumption would be 0.8% higher in 2029 than otherwise in the 'what if' scenario and GST revenue is projected to increase by a similar proportion.

**TABLE 3-1: IMPACT ON GOVERNMENT REVENUE (\$2009 MILLION)**

Government Income (2009 \$ million)	Revenue		Base case 2029	Income in 2029 after changes to Indigenous LE and LFP	2029		
	2009	% of Total Govt Revenue			Amount of revenue rise	Rise as % of base case 2029	
<b>State Government</b>							
<i>Personal</i>							
Gambling	\$5,200	1.3%	\$6,840	\$6,910	\$70	1.0%	
<i>Subtotal</i>	<i>\$5,200</i>	<i>1.3%</i>	<i>\$6,840</i>	<i>\$6,910</i>	<i>\$70</i>	<i>1.0%</i>	
<i>Business</i>							
Payroll tax	\$15,520	3.8%	\$19,840	\$20,000	\$160	0.8%	
<i>Subtotal</i>	<i>\$15,520</i>	<i>3.8%</i>	<i>\$19,840</i>	<i>\$20,000</i>	<i>\$160</i>	<i>0.8%</i>	
<i>Consumption and Other</i>							
Land and Property	\$16,690	4.1%	\$21,930	\$22,120	\$190	0.9%	
GST	\$49,930	12.2%	\$63,820	\$64,350	\$530	0.8%	
Financial and Capital Transactions	\$14,250	3.5%	\$18,720	\$18,830	\$110	0.6%	
Provision of Goods and Services	\$280	0.1%	\$350	\$350	\$0	0.0%	
Insurance	\$2,900	0.7%	\$3,810	\$3,840	\$30	0.8%	
Motor Vehicle Taxes	\$7,170	1.7%	\$9,420	\$9,490	\$70	0.7%	
Other	\$530	0.1%	\$680	\$680	\$0	0.0%	
<i>Subtotal</i>	<i>\$91,740</i>	<i>22.3%</i>	<i>\$118,720</i>	<i>\$119,670</i>	<i>\$950</i>	<i>0.8%</i>	
<b>State Total Income</b>	<b>\$112,460</b>	<b>27.4%</b>	<b>\$145,400</b>	<b>\$146,580</b>	<b>\$1,180</b>	<b>0.8%</b>	
<b>Australian Government</b>							
<i>Personal</i>							
Income tax	\$105,500	25.7%	\$124,790	\$126,480	\$1,690	1.4%	
Other Personal	\$30,400	7.4%	\$35,960	\$36,310	\$350	1.0%	
Medicare Levy	\$8,240	2.0%	\$9,750	\$9,830	\$80	0.8%	
Refunds	\$21,880	5.3%	-\$25,880	-\$26,090	-\$210	0.8%	
<i>Subtotal</i>	<i>\$166,020</i>	<i>40.4%</i>	<i>\$144,620</i>	<i>\$146,530</i>	<i>\$1,910</i>	<i>1.3%</i>	
<i>Business</i>							
Corporate tax	\$67,470	16.4%	\$79,800	\$80,580	\$780	1.0%	
Superannuation	\$8,230	2.0%	\$9,740	\$9,820	\$80	0.8%	
Fringe Benefits tax	\$4,170	1.0%	\$4,940	\$4,980	\$40	0.8%	
<i>Subtotal</i>	<i>\$79,870</i>	<i>19.5%</i>	<i>\$94,480</i>	<i>\$95,380</i>	<i>\$900</i>	<i>1.0%</i>	
<i>Consumption</i>							
Sales/Other Indirect tax	\$1,160	0.3%	\$1,480	\$1,490	\$10	0.7%	
Excise	\$24,210	5.9%	\$30,940	\$31,240	\$300	1.0%	
<i>Subtotal</i>	<i>\$25,370</i>	<i>6.2%</i>	<i>\$32,420</i>	<i>\$32,730</i>	<i>\$310</i>	<i>1.0%</i>	
<i>Other</i>							
Petroleum Resources Rent Tax	\$1,330	0.3%	\$1,580	\$1,590	\$10	0.6%	
Customs Duties	\$6,860	1.7%	\$8,770	\$8,850	\$80	0.9%	
Other taxes, fees and fines	\$2,760	0.7%	\$3,530	\$3,560	\$30	0.8%	
Non-tax revenue	\$15,950	3.9%	\$20,390	\$20,580	\$190	0.9%	
<i>Subtotal</i>	<i>\$26,900</i>	<i>6.6%</i>	<i>\$34,270</i>	<i>\$34,580</i>	<i>\$310</i>	<i>0.9%</i>	
<b>Total Australian Government</b>	<b>\$298,160</b>	<b>72.6%</b>	<b>\$305,790</b>	<b>\$309,220</b>	<b>\$3,430</b>	<b>1.1%</b>	
<b>Total Income</b>	<b>\$410,620</b>	<b>100.0%</b>	<b>\$451,190</b>	<b>\$455,800</b>	<b>\$4,610</b>	<b>1.0%</b>	

Source: modelling by Access Economics

### 3.3 EXPENDITURE

#### Box 3-1 Expenditure assumptions

As explained above in the introduction to this chapter, while ‘remedial’ outlays are likely to be necessary if improvements in the circumstances of Indigenous Australians are to be achieved, they not included in this analysis. The estimates here are based on the set of mainstream programs currently in place. Some Indigenous specific programs are, however, noted.

The methodology is described in detail in Appendix A.

In brief, two scenarios are estimated for the year 2029 — similar to those in the previous chapter — a base case and a ‘what if’ scenario.

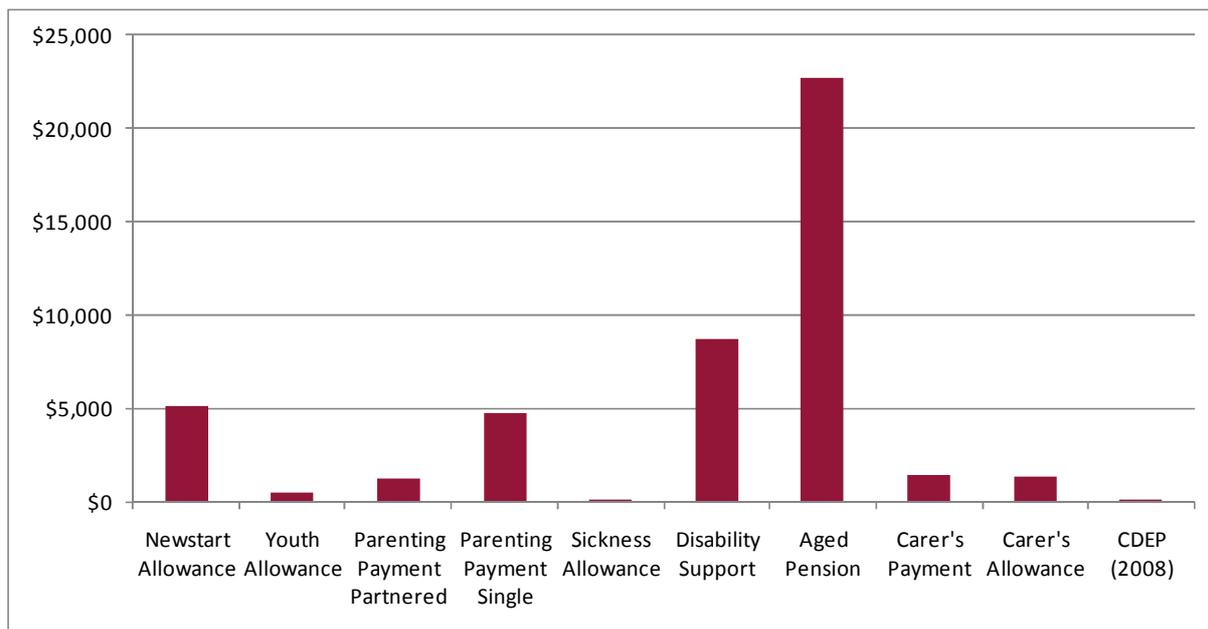
In the **base case**, 2009 and 2029 government expenditure per head (and total expenditure) is estimated based on base case Indigenous population estimates and the continuation of current Indigenous participation rates (for example in education), welfare recipient rates or government expenditure per head.

In the **‘what if’ scenario**, 2009 and 2029 government expenditure per head (and total expenditure) is generated based on the ‘what if’ scenario Indigenous population estimates, assuming Indigenous participation rates (for example, in education), welfare recipient rates, or government expenditure per head gradually match the Australian average.

#### 3.3.1 WELFARE PAYMENTS (AUSTRALIAN GOVERNMENT)

In 2004-05, 52% of the Indigenous population reported government pensions as their primary source of income, close to twice the rate of the total population, which reports government pensions as their primary source of income at 26% (SCRGSP 2007, p.186, attachment table 3A.6.8). The following welfare payments — funded and administered by the Australian Government — are discussed here: Newstart, Youth Allowance (job seekers), Parenting Payment, Sickness Allowance, Disability Support Pension, Aged Pension, Carer’s Payment, Carer’s Allowance, and CDEP. Total expenditure on these programs is detailed in Chart 3-1.

**CHART 3-1: TOTAL EXPENDITURE (ALL AUSTRALIANS) INCORPORATED IN THIS ANALYSIS, \$ MILLION, 2007**



If Indigenous life expectancy, labour force participation and labour productivity in 2029 are at the same levels as today (i.e. the base case), government outlays on this set of programs would be \$2.4 billion (Table 3-2). By comparison, if the outlook for Indigenous people in 2029 is much the same as the Australian average, (i.e. the 'what if' scenario) government outlays in 2029 would be almost half this — \$1.4 billion — with a saving of \$1.1 billion.

Savings are projected for all programs considered here except the Aged Pension (Table 3-2). In the 'what if' scenario, outlays on Aged Pension payments in 2029 are higher than in the base case because of improvements in Indigenous life expectancy. In 2029, there are nearly 15,000 more Indigenous people aged 65 years and over alive in the 'what if' scenario than in the base case.

The largest source of savings in dollar terms in 2029 derives from the Newstart Allowance (including Newstart, Mature Age Newstart and Partner Allowance) — a saving of \$473 million in that year. This is because in 2009, 8.6% of Newstart recipients are Indigenous — over three times their representation in the population. People aged over 65 years are not eligible for Newstart, so increased Indigenous life expectancy has a relatively minor effect, with the eligible population forecast to be only 4.7% higher in 2029 under the 'what if' scenario than the base result, a difference of 19,900. In contrast, the projected number of Indigenous recipients of Newstart is 21,306 lower in the 'what if' scenario than the base case — reflecting lower Indigenous unemployment due in part to improved education and health.

Other forms of welfare which are likely to generate savings are also analysed.

- ❑ Sickness, Disability and Carers' payments — which when the gap is closed are likely to be less than in the base case because the number of individuals who are able to work outweighs the overall increase in the population.
- ❑ The Youth Allowance which is likely to be less than otherwise because of lower youth unemployment among Indigenous people which outweighs the impact of higher school retention rates of Indigenous students who claim the Youth Allowance while completing their studies.

- Savings in Single and Partnered Parenting Payments are generated because individuals previously eligible in 2029 are no longer eligible because their incomes are higher and they fail the means tests.

The estimates of savings from CDEP should merely be noted. At the time of writing, governments were still considering the future of this program, and the need for an employment training initiative will depend on a number of factors including job opportunities in remote areas. Savings arise under the methodology applied here because CDEP is an Indigenous-specific program, with 99% of recipients identifying as Indigenous.

**TABLE 3-2: WELFARE PROJECTIONS AND SAVINGS, (2009 DOLLARS \$'000) (A)**

Program	2005	2006	2007	2009	2029	2029	2029
					Base	Shock*	Savings
<b>Newstart Allowance</b>							
Indigenous population base	235,850	241,240	247,550	260,340	405,650	425,550	
Indigenous expenditure (\$'000)	\$344,640	\$348,390	\$373,300	\$403,820	\$629,220	\$156,450	\$472,770
Average per capita spend	\$460	\$430	\$410	\$370			
Indigenous per capita spend	\$1,460	\$1,440	\$1,510	\$1,550	\$1,550	\$370	
<b>Youth Allowance</b>							
Indigenous population base	84,230	85,030	90,050	98,810	117,540	120,560	
Indigenous expenditure (\$'000)	\$76,280	\$91,050	\$86,040	\$93,100	\$110,750	\$20,840	\$89,910
Average per capita spend	\$900	\$200	\$200	\$170			
Indigenous per capita spend	\$900	\$1,070	\$960	\$940	\$940	\$170	
<b>Parenting Payment Partnered</b>							
Indigenous population base	265,520	269,850	277,280	295,970	444,310	464,690	
Indigenous expenditure (\$'000)	\$71,030	\$74,730	\$78,640	\$84,410	\$126,720	\$39,100	\$87,620
Average per capita spend	\$100	\$90	\$90	\$80			
Indigenous per capita spend	\$270	\$280	\$280	\$290	\$290	\$80	
<b>Parenting Payment Single</b>							
Indigenous population base	43,090	45,480	277,780	295,970	444,310	464,690	
Indigenous expenditure (\$'000)	\$269,180	\$292,780	\$303,500	\$330,350	\$495,910	\$167,650	\$328,260
Average per capita spend	\$380	\$370	\$350	\$360			
Indigenous per capita spend	\$1,010	\$1,090	\$1,090	\$1,120	\$1,120	\$360	
<b>Sickness Allowance</b>							
Indigenous population base	43,090	45,480	247,550	260,340	405,650	425,550	
Indigenous expenditure (\$'000)	\$1,850	\$2,000	\$1,990	\$2,170	\$3,380	\$2,670	-\$2,670
Average per capita spend	\$7	\$7	\$7	\$6			
Indigenous per capita spend	\$8	\$8	\$8	\$8	\$8	\$6	
<b>Disability Support</b>							
Indigenous population base	43,090	45,480	302,530	321,790	471,170	492,410	
Indigenous expenditure (\$'000)	\$175,280	\$283,120	\$318,810	\$375,840	\$550,310	\$320,590	\$230
Average per capita spend	\$410	\$610	\$620	\$650			
Indigenous per capita spend	\$610	\$970	\$1,050	\$1,170	\$1,170	\$650	
<b>Aged Pension</b>							
Indigenous population base	43,090	45,480	34,800	20,030	60,000	66,730	
Indigenous expenditure (\$'000)	\$84,970	\$92,390	\$109,670	\$128,650	\$333,980	\$562,720	-\$228,740
Average per capita spend	\$7,580	\$7,660	\$8,250	\$8,430			
Indigenous per capita spend	\$5,230	\$5,400	\$6,060	\$6,420	\$6,420	\$8,430	
<b>Carer's Payment</b>							
Indigenous population base	43,090	45,480	333,350	354,870	537,240	573,690	
Indigenous expenditure (\$'000)	\$33,580	\$39,970	\$49,670	\$64,550	\$97,720	\$56,100	\$41,620
Average per capita spend	\$70	\$70	\$80	\$100			
Indigenous per capita spend	\$110	\$120	\$150	\$180	\$180	\$100	
<b>Carer's Allowance</b>							
Indigenous population base	43,090	45,480	333,350	354,870	537,240	573,690	
Indigenous expenditure (\$'000)	\$35,070	\$41,200	\$47,590	\$59,820	\$90,560	\$51,920	\$38,640
Average per capita spend	\$70	\$80	\$80	\$90			
Indigenous per capita spend	\$110	\$130	\$140	\$170	\$170	\$90	
<b>TOTAL EXPENDITURE (\$'000)</b>	<b>\$1,091,880</b>	<b>\$1,265,630</b>	<b>\$1,369,210</b>	<b>\$1,542,710</b>	<b>\$2,438,550</b>	<b>\$1,378,040</b>	<b>\$1,057,130</b>
<b>CDEP</b>							
Indigenous population base	505,230	516,950	527,200	547,950	798,770	843,060	
Indigenous expenditure (\$'000)			\$117,350	\$121,170	\$174,860	\$4,720	\$170,140
% Indigenous population on CDEP				3.6%			
% national population on CDEP				0.1%	0.1%	3.6%	

\*The 'shock' column represents the 'what if' scenario — the movement due to increased life expectancy, and labour force participation and productivity changes.

(a) Method described in detail in Appendix A.

### Box 3-2 Child abuse and neglect

In 2006-07, Indigenous children were more than five times as likely as other children to be the subject of a substantiation<sup>6</sup> of abuse or neglect (AIHW 2008a). Other reports have highlighted some of the complex underlying causes for the over-representation of Indigenous children in the child protection system (eg. NTBIPACSA 2007, HREOC 1997, Young 2006). The impact of child abuse and neglect on children and their families and communities is considerable including:

- pain and suffering;
- premature death arising either from the injury, or from consequent long term mental illness and potential for suicidal behaviour;
- health system costs of injury or mental illness;
- the costs to governments of administering child protection and out of home care services;
- learning difficulties and associated educational support;
- lost productivity — victims of abuse are more likely to be unemployed or underemployed;
- crime (including juvenile delinquency, adult criminality, homelessness, substance abuse); and
- intergenerational transmission of abuse.

Keatsdale (2003) estimated the cost of all of these impacts for the year 2001-02 at \$4.93 billion (including both Indigenous and non-Indigenous Australians).<sup>7</sup> The authors estimated there were around 38,700 abused and neglected children in 2001-02 — so the cost was \$127,386 per abused child. If Indigenous children are more than five times as likely to be the subject of abuse or neglect and Indigenous people comprise 2.4% of the population, a *ball park* estimate of the cost of abuse and neglect of Indigenous children is \$592 million in 2001-02. Inflated at 2.5% per year, this is around \$686 million in 2007-08.

#### The costs of ameliorating child abuse and neglect

A detailed analysis of the types of actions necessary to ameliorate child abuse is out-of-scope here, but notably:

- the Northern Territory Government response to the *Little Children are Sacred* Report (NTBIPACSA 2007) was costed at \$286.4 million over five years<sup>8</sup>; and
- the Australian Government's *Northern Territory Emergency Response* will involve expenditure in excess of \$580 million in 2007-08.<sup>9</sup>

<sup>6</sup> 'Substantiation' means that a child protection agency has investigated a report of child abuse or neglect, and has concluded that the child has been, is being, or is likely to be, abused, neglected or otherwise harmed.

<sup>7</sup> On Keatsdale's (2003) estimates, abuse prevention programs represented only around 3% of the total cost.

<sup>8</sup> NTCMD 2007

<sup>9</sup> FaCSIA 2007

### 3.3.2 HEALTH EXPENDITURE (AUSTRALIAN, STATE AND TERRITORY GOVERNMENTS)

Table 3-3 provides a breakdown of expenditure per capita by broad health service and Indigenous status. In 2004-05, spending per head on Indigenous Australians was substantially higher than the Australian average for:

- ❑ public hospitals;
- ❑ community health services (reflecting expenditure on Indigenous specific health services — Aboriginal Community Controlled Health Organisations);
- ❑ patient transport; and
- ❑ public health research and other health services (including aids and appliances) (AIHW 2008).

Conversely, spending per head on Indigenous Australians was substantially less than the Australian average for:

- ❑ Medicare;
- ❑ pharmaceuticals;
- ❑ residential aged care;
- ❑ dental services; and
- ❑ private hospitals.

**TABLE 3-3: HEALTH EXPENDITURE PER CAPITA, BY BROAD HEALTH SERVICE AND INDIGENOUS STATUS, 2004-05 AND 2009**

State and Federal Government	Expenditure (2005 \$'000)		Expenditure per person (2005 \$) Australian			Expenditure per person (2009 \$) Australian		
	Total	% Indigenous	Indigenous	Average	Ratio	Indigenous	Average	Ratio
Private hospitals	\$2,549,900	0.7%	\$30	\$130	0.23	\$40	\$160	0.25
Public hospitals <sup>1</sup>	\$20,625,200	5.0%	\$2,050	\$1,010	2.03	\$2,600	\$1,269	2.05
Medical services	\$11,588,600	1.2%	\$280	\$570	0.49	\$360	\$720	0.50
Community health services <sup>2</sup>	\$3,530,600	14.1%	\$990	\$170	5.82	\$1,250	\$220	5.68
Dental and other professions	\$1,598,000	2.2%	\$70	\$80	0.88	\$90	\$100	0.90
Pharmaceuticals	\$6,051,100	1.2%	\$140	\$300	0.47	\$180	\$370	0.49
Services for older people	\$4,392,300	0.7%	\$60	\$220	0.27	\$80	\$280	0.29
Patient transport	\$1,398,700	7.3%	\$200	\$70	2.86	\$260	\$90	2.89
Public health research	\$2,779,700	4.4%	\$240	\$140	1.71	\$310	\$180	1.72
Other health services <sup>3</sup>	\$2,097,200	3.7%	\$150	\$100	1.50	\$190	\$130	1.46
<b>Total health expenditure</b>	<b>\$56,611,300</b>	<b>3.8%</b>	<b>\$4,210</b>	<b>\$2,780</b>	<b>1.51</b>	<b>\$5,360</b>	<b>\$3,490</b>	<b>1.54</b>

<sup>1</sup> Includes emergency departments, other non-admitted patient services and public psychiatric hospitals

<sup>2</sup> Includes funding of dental services by states and territories

<sup>3</sup> Includes health administration, aids and appliances, and other health services

Source: AIHW (2008)

Overall, improving the life expectancy of Indigenous Australians and assuming per capita health expenditure on Indigenous people in 2029 is the same as that for all Australians leads to a saving of \$1.3 billion in health expenditure in 2029 (Table 3-4). While outlays on Medicare, pharmaceuticals, residential aged care and private hospitals are higher than otherwise, these dissavings are outweighed by expenditure reductions in community health services and public hospitals.

- ❑ As Indigenous Australians earn higher incomes, they will be more readily able to afford private health insurance, and hence private hospital care.
- ❑ Higher Medicare expenditure may reflect greater use of Medicare funding by Indigenous Health Services, particularly in rural/remote areas.

**TABLE 3-4: IMPACT ON GOVERNMENT HEALTH EXPENDITURE IN 2029(A)**

<b>State and Federal Government</b>	<b>2029 Base (\$'000s)</b>	<b>Base Expenditure per Capita</b>	<b>2029 Shock (\$'000s)</b>	<b>Shock Expenditure per Capita</b>	<b>2029 Savings (\$'000s)</b>
<b>Broad Health Service</b>					
Private hospitals	\$34,790	\$40	\$132,360	\$160	-\$97,570
Public hospitals <sup>1</sup>	\$2,077,460	\$2,600	\$1,070,620	\$1,270	\$1,006,840
Medical services	\$282,560	\$350	\$601,540	\$710	-\$318,980
Community health services <sup>2</sup>	\$1,000,320	\$1,250	\$183,270	\$220	\$817,050
Dental and other professions	\$71,190	\$90	\$82,950	\$100	-\$11,760
Pharmaceuticals	\$145,400	\$180	\$314,100	\$370	-\$168,700
Services for older people	\$60,330	\$80	\$228,000	\$270	-\$167,670
Patient transport	\$204,930	\$260	\$72,600	\$90	\$132,330
Public health research	\$246,760	\$310	\$144,290	\$170	\$102,470
Other health services <sup>3</sup>	\$154,050	\$190	\$108,860	\$130	\$45,190
<b>Total health expenditure</b>	<b>\$4,277,790</b>	<b>\$535</b>	<b>\$2,938,590</b>	<b>\$349</b>	<b>\$1,339,200</b>

(a) Method described in detail in Appendix A.

1 Includes emergency departments, other non-admitted patient services and public psychiatric hospitals

2 Includes funding of dental services by states and territories

3 Includes health administration, aids and appliances, and other health services

Source: Calculations by Access Economics based on expenditure estimates in AIHW (2008).

**Box 3-3 Estimate of remedial expenditure on primary care for Indigenous people**

Giving Indigenous Australians the same level of access to **primary health care** as non-Indigenous Australians with comparable health status would require substantial increases in funding to expand the medical workforce. Access Economics (2004) estimated that at least 250 full time equivalent medical practitioners would be required as well as additional access to the PBS. Overall, it was estimated that funding for primary care would need to increase by around \$400 million per annum. In addition, training more health professionals would be necessary at a cost of \$36.5 million per annum (running to \$167 million over six years).

The workforce estimates were derived by calculating how many additional primary care (medical) services Indigenous people are likely to need based on their higher prevalence of long term health conditions and their greater use of hospitals. Although the Indigenous population is younger than the non-Indigenous population, the average health of Indigenous Australians was similar to that of other Australians aged 50 to 54 years. The rate at which non-Indigenous people aged 50 to 54 used services was therefore suggested as the benchmark for the number of Medicare services per head Indigenous people should be using. On this basis, Indigenous Australians need to use 12.75 Medicare billed medical services per person each year.

Further, to kick-start the disease prevention cycle among Indigenous people, it was suggested that there should be a mark-up on service use by Indigenous Australians. Such a strategy would involve the careful targeting of key risk factors with a view to reducing both morbidity and mortality. In the absence of empirical research, it was assumed that a gross addition of 20% to the primary care workforce would lead to a net requirement of 15%, as increased targeting of prevention is likely to lead to offsetting savings in tertiary care (Access Economics, 2004:9). Mooney (1998) made a similar argument — suggesting that topping up funding for Indigenous health based on differences in current levels of need may do no more than stop the health gap widening. Other studies have similarly suggested a mark-up is necessary because of the need for Aboriginal and Torres Strait Islander services to provide culturally appropriate care, including the need for cross-cultural mediation. Thus, the final Access Economics (2004) estimate was that Indigenous people need 14.7 medical services per person year.

**3.3.3 EDUCATION (AUSTRALIAN, STATE AND TERRITORY GOVERNMENTS)**

Indigenous Australians presently have much lower participation and attainment rates in education than the national average, and these gaps increase with the level of schooling. For example, in 2006 apparent retention rates for full-time students between years 10 and 12 were 76.1% for the total population, but only 46.7% for Indigenous students (SCRGSP 2007, attachment table 4A.117), while 2005 participation rates in preschool education are also lower for Indigenous children, with 23.8% of preschool aged Indigenous children enrolled compared to a national average of 28% (SCRGSP 2007). Table 3-5 shows that Indigenous students in 2005 lagged behind the national average rate of attainment of all educational benchmarks by 10%, and that this gap increases with the level of schooling.

**TABLE 3-5: ATTAINMENT OF NATIONAL BENCHMARKS, 2005**

	Reading	Writing	Numeracy
<i>Year 3</i>			
Total	92.7 ± 1.6	92.8 ± 1.6	94.1 ± 1.1
Indigenous	78.0 ± 4.3	74.0 ± 4.7	80.4 ± 3.8
<i>Year 5</i>			
Total	87.5 ± 1.8	93.3 ± 1.3	90.8 ± 1.3
Indigenous	62.8 ± 4.1	74.3 ± 4.3	66.5 ± 3.9
<i>Year 7</i>			
Total	89.8 ± 0.8	92.2 ± 1.5	81.8 ± 0.9
Indigenous	63.8 ± 2.9	72.3 ± 4.3	48.8 ± 2.9

Comparisons of base case and 'what if' scenario projections of expenditure on education in 2029 are consistent with *a priori* expectations that total education spending would need to be higher than otherwise to achieve improvements in Indigenous peoples' life expectancy and living standards (Table 3-6). Government outlays on education are \$273 million higher in 2029 in the 'what if' scenario.

- ❑ The largest source of dissaving in 2029 is Higher education (\$265.3 million). In 2009, the Indigenous Higher education participation rate is 3.1%, 63% of the national average (4.9%).
- ❑ There is a forecast saving in Vocational Education and Training (VET) expenditure of \$206.7 million in 2029. Currently, Indigenous people have higher participation rates in VET than the rest of the population which falls to match the national average in 2029 reflecting an increase in participation in other forms of education (secondary school and university).

**TABLE 3-6: IMPACT OF EDUCATION PARTICIPATION ON GOVERNMENT BUDGETS(A)**

Program	2009	2029	2029	2029
Expenditure (\$'000s)		Base	Shock*	Savings
<b>Expenditure on Indigenous Students by Level of School</b>				
Preschool	\$100,900	\$150,190	\$252,990	-\$102,800
Primary and Secondary	\$1,410,920	\$1,710,410	\$1,825,010	-\$114,600
Higher education	\$196,490	\$308,600	\$527,480	-\$218,880
VET	\$211,980	\$332,930	\$144,540	\$188,390
<b>Total Expenditure on Indigenous Students</b>	<b>\$1,920,290</b>	<b>\$2,502,130</b>	<b>\$2,750,020</b>	<b>-\$247,890</b>

(a) Method and sources described in detail in Appendix A.

### For noting ...

Indigenous-specific education funding programs are not included in the analysis but may be required to achieve increased Indigenous participation in education. Some such Indigenous-specific education funding programs are already in place.

- ❑ The Indigenous Education Strategic Initiatives Program (IESIP) includes recurrent supplementary assistance for Indigenous students, remedial English as a second language work with students whose first language is their traditional Indigenous language, and projects under the National Indigenous English and Numeracy Strategy. This Program provides funding to schools based on remoteness and initiatives taken by the schools to promote positive Indigenous education outcomes. Funding for IESIP is undertaken on a quadrennial basis. In 2004 funding for IESIP totalled \$41.2 million.
- ❑ The Indigenous Education Direct Assistance Program (IEDAP) includes the Aboriginal Tutorial Assistance Scheme, Aboriginal Student Support and a Parent Awareness Scheme. It further provides a Vocation and Educational Guidance Scheme. Funding

is based upon a per capita formula which takes into account the number of Indigenous students enrolled at the school, their level of schooling and a remoteness weighting. In 2005 funding for IEDAP totalled \$67.7 million.

In addition, the Australian Government also provides income support to students (Austudy including Youth Allowance payments, and Abstudy). It is difficult to forecast likely scenarios for these payments. Using the methodology outlined in detail in Appendix A, under the 'what if' scenario, Government expenditure on income support for students would be less than otherwise, probably reflecting higher Indigenous incomes not meeting means test requirements for eligibility (Table 3-7). Most of the savings arise under the Abstudy program. However, this type of remedial expenditure is likely to be necessary to achieve increases in Indigenous participation in post secondary education, so projecting savings is not necessarily consistent with reality — and reflects the uncertainty surrounding this type of analysis.

**TABLE 3-7: IMPACT OF EDUCATION RELATED WELFARE ON GOVERNMENT BUDGETS(A)**

Program	2007	2009	2029 Base	2029 Shock*	2029 Savings
<b>Expenditure (\$'000s)</b>					
<b>Abstudy</b>					
Total Expenditure	\$222,240	\$214,290	\$318,650	\$61,190	\$257,460
Average per capita expenditure	\$10	\$10			
Average indigenous per capita expenditure	\$670	\$600	\$600	\$50	
<b>Austudy</b>					
Total Expenditure - Austudy and Youth Allowance	\$3,870	\$13,340	\$20,410	\$6,950	\$13,460
Average per capita expenditure	\$110	\$160	\$50	\$10	
Average indigenous per capita expenditure	\$30	\$50			
<b>Total Indigenous education expenditure<sup>1</sup></b>	<b>\$226,110</b>	<b>\$227,630</b>	<b>\$339,060</b>	<b>\$68,140</b>	<b>\$270,920</b>

(a) Method and sources described in detail in Appendix A.

### 3.3.4 JUSTICE (STATE AND TERRITORY GOVERNMENTS)

Indigenous Australians are currently over-represented in Australia's prison population and therefore government expenditure on the prison system. In 2007 there were on average 15,723 Indigenous Australians serving some form of imprisonment or community correction sentence on any given day, compared with the population total of 79,416. Indigenous Australians therefore accounted for 19.8% of the total population serving criminal sentences. 2.98% of Indigenous Australians were serving some form of correction order on any given day of 2007, compared to just 0.38% of the total national population, meaning Indigenous Australians were over-represented in the Australian prison population at a rate of almost 8 to 1. It is anticipated that closing the gap of Indigenous disadvantage would produce a corresponding fall in the imprisonment rate of Indigenous Australians, and that there are therefore large potential savings from such a reduction in the prisoner population.

Table 3-8 shows the results of estimates on government expenditure on justice in 2029 and the potential savings from the 'what if' to Indigenous living standards. The largest potential savings occur in secure prisons. The total saving is \$870.3 million in 2029, with spending on secure prisons 90.8% less than otherwise because there are fewer Indigenous prisoners.

**TABLE 3-8: IMPACT OF JUSTICE ON GOVERNMENT BUDGETS (A)**

Correction Type	2007	2009	2029 <i>Base</i>	2029 <i>Shock*</i>	2029 <i>Savings</i>
<b>Open plus Periodic Detention</b>					
Indigenous Expenditure (\$'000)	\$123,990	\$135,510	\$205,150	\$19,430	\$185,720
Total Expenditure (\$'000)	\$593,520	\$593,460			
Indigenous per capita spend	\$370	\$380	\$380	\$30	
Average per capita spend	\$40	\$30			
<b>Secure</b>					
Indigenous Expenditure (\$'000)	\$386,070	\$429,560	\$650,320	\$58,810	\$591,510
Total Expenditure (\$'000)	\$1,667,910	\$1,796,470			
Indigenous per capita spend	\$1,150	\$1,210	\$1,210	\$100	
Average per capita spend	\$100	\$100			
<b>Community Corrections</b>					
Indigenous Expenditure (\$'000)	\$45,660	\$50,950	\$77,130	\$8,390	\$68,740
Total Expenditure (\$'000)	\$248,040	\$256,330			
Indigenous per capita spend	\$140	\$150	\$150	\$20	
Average per capita spend	\$20	\$20			
<b>Total Indigenous Expenditure (\$'000)</b>	<b>\$555,720</b>	<b>\$616,020</b>	<b>\$932,600</b>	<b>\$86,630</b>	<b>\$845,970</b>

(A) Method and sources described in detail in Appendix A.

### Box 3-4 Petrol sniffing

Petrol sniffing has devastating health and social consequences, causing (among other things) mental impairment, brain injury and death. While both Indigenous and non-Indigenous people engage in petrol sniffing, it has been relatively more prevalent among Aboriginal and Torres Strait Islander communities.

#### Ameliorating sniffing

Most importantly, ameliorating sniffing among Indigenous communities would extend life: the average age at death of sniffers is around 23 years — for Indigenous people, this implies an average of 42 years of life lost per addict. In addition, some of the costs to governments and communities of sniffing that would be avoided if sniffing were ameliorated include:

- expenditure on hospitalisations from sniffing related illness (at an average cost of \$4,855 per episode of hospital care in 2005), on rehabilitation, and on long term care and accommodation (\$59,532 per person in 2005) of sniffers with permanent or long term brain damage;
- government outlays on unemployment benefits. Addicts are less likely to be employed than other Indigenous people. In one Australian Indigenous community, eradication of petrol sniffing increased the likelihood of sniffers being employed from 7% to 63%. Temporary absences from work due to sniffing related illness would also be reduced;
- justice system expenditure — including police and court time, incarcerations and inquests; and
- the costs of caring for addicts incurred by community, family and friends.

In the proposed roll out region for Opal fuel in Central Australia in 2005, the crime and justice system costs of petrol sniffing were estimated at \$16.2 million, productivity losses at \$8.3 million, health, long term care and rehabilitation costs were each about \$4.1 million, \$4.2 million and \$3.7 million respectively, and informal care provided by families and significant others \$2.3 million.

#### The costs of ameliorating sniffing

The economic costs of petrol sniffing would only be avoided through well targeted strategies to prevent the take up of sniffing and reduce the resultant adverse outcomes. Suggested strategies involve expanding government outlays and include:

- supply of appropriate fuel (possibly requiring government subsidies); and
- the implementation of successful education, harm minimisation, legal deterrence and employment and training programs, together with community action.

The total costs of a package of such programs in the Opal fuel rollout region was estimated to cost \$26.6 million in 2005.

Source: Access Economics (2006)

### 3.3.5 HOUSING (AUSTRALIAN, STATE AND TERRITORY GOVERNMENTS)

There are a number of housing programs provided by Australian, State and Territory Governments. The focus here is on mainstream public housing, State owned and managed Indigenous housing, mainstream community housing, Indigenous community housing and Commonwealth Rent Assistance. Indigenous Australians currently access all of these at much higher rates than the total Australian population. Consequently, a reduction in Indigenous disadvantage is likely to be associated with savings to governments in housing related programs.

#### Public and community housing

Overall, projected savings in 2029 are over \$173 million (Table 3-9) — most from public housing (savings of \$170.4 million). Indigenous Australians currently access public housing at four times the rate of the overall population.

Notably, the method in Table 3-9 assumes that the proportion of the population accessing Indigenous specific housing does not change, so expenditure on these programs in 2029 is higher than otherwise because of the higher Indigenous ‘what if’ scenario population in 2029. Indigenous specific housing programs may be considered ‘remedial’ expenditure.

**TABLE 3-9: PUBLIC AND COMMUNITY HOUSING RELATED CHANGES TO GOVERNMENT BUDGETS (A)**

Program Expenditure (\$'000s)	2009	2029 Base	2029 Shock*	2029 Savings
<b>Indigenous Community Housing</b>				
% Indigenous Population	26%	26%	26%	
% Total Population	0%			
Total Indigenous Expenditure	\$62,970	\$91,790	\$96,880	-\$5,090
<b>National Community Housing</b>				
% Indigenous Population	2.6%	2.6%	0.9%	
% Total Population	0.9%			
Total Indigenous Expenditure	\$16,530	\$24,090	\$8,800	\$15,290
<b>State Owned and Managed Indigenous Housing</b>				
% Indigenous Population	17%	17%	17%	
% Total Population	0%			
Total Indigenous Expenditure	\$85,350	\$124,420	\$131,320	-\$6,900
<b>National Public (State Owned) Housing</b>				
% Indigenous Population	33%	33%	8%	
% Total Population	8%			
Total Indigenous Expenditure	\$159,900	\$233,090	\$62,670	\$170,420
<b>Total Indigenous housing expenditure</b>	<b>\$324,750</b>	<b>\$473,390</b>	<b>\$299,670</b>	<b>\$173,720</b>

(A) Method and sources described in detail in Appendix A.

#### Commonwealth Rent Assistance (CRA)

Indigenous Australians currently access CRA at close to twice the rate of the total population. If Indigenous recipient rates match those of the Australian average, savings to the Australian Government are projected at around \$40 million in 2029 (Table 3-10).

**TABLE 3-10: RENTAL ASSISTANCE CHANGES TO GOVERNMENT BUDGETS (A)**

<b>Commonwealth Rental Assistance Expenditure (\$'000s)</b>	<b>2007</b>	<b>2009</b>	<b>2029 Base</b>	<b>2029 Shock*</b>	<b>2029 Savings</b>
% Indigenous Population	9.2%	8.8%	8.8%	5.4%	
% Total Population	5.6%	5.4%			
<b>Total Indigenous Rental Assistance</b>	<b>\$69,510</b>	<b>\$75,840</b>	<b>\$114,820</b>	<b>\$75,640</b>	<b>\$39,180</b>

(A) Method and sources described in detail in Appendix A.

## 4. BURDEN OF DISEASE

The implications of improving the circumstances of Indigenous Australians for GDP, output per Australian, and for government budgets do not include other important reasons underlying arguments for action. A key companion to the 'economic' improvements modelled in other chapters of this report is a reduction in the burden of disease experienced by Indigenous Australians, and thus an improvement in their health and quality of life.

Differences in the burden of disease experienced by Indigenous Australians compared with the Australian population as a whole are discussed in this chapter based on the work of Vos et al (2007) and Begg et al (2007).

### 4.1 OVERVIEW AND DEFINITIONS

Vos et al (2007) compared the burden of disease in the total Australian population in 2003 as calculated by Begg et al (2007) with that in the Indigenous population in 2003. More than 170 diseases and injuries are included in the comparison.

Health related quality of life is described using 'burden of disease' measures. Specifically, Vos et al (2007) and Begg et al (2007) used 'disability adjusted life years' (DALYs) to measure the burden of disease. DALYs are described in Box 4-1.

To find the excess burden of disease among Indigenous people, the Indigenous burden of disease is compared with the values the DALY estimates would have taken had Indigenous Australians experienced the same mortality and disability as the general Australian population. Since the disease burden varies with age, and the age distribution of the Indigenous population is different to that of the total Australian population (Indigenous people are on average younger), comparisons between the Indigenous and all Australian population are standardised for age.

The estimated gap in life expectancy in this chapter differs from that in previous chapters of this report because a different methodology has been used.

The life expectancy gap between the Indigenous and total Australian population estimated by Vos et al (2007) and used to estimate the difference in the disease burden between the Indigenous and total Australian population is less than that estimated by the ABS (see Box 4-1) — the ABS estimated the gap at around 17 years compared with the Vos et al (2007) estimates of approximately 13 years. If the ABS estimates had been used, the burden of disease among Indigenous Australians compared with the total Australian population would have been greater than calculated by Vos et al (2007) and presented here. The modelling estimates in Chapters 2 and 3 above are based on the ABS life expectancy gap estimates. If the Vos et al (2007) estimates had been used, the impact on output over 20 years would have been lower.

**Box 4-1 Measuring the Burden of disease — DALYs**

Vos et al (2007) utilise Disability Adjusted Life Years (DALYs) as a measure of the disease burden. One DALY is equivalent to one year of healthy life lost, including both fatal and non-fatal disease:

$$DALY = YLL + YLD$$

Where YLL represents years of life lost due to premature death, and YLD represents a year lived with disability.

YLL = number of deaths x expected life remaining (in years)

YLD = number of incident cases x disability weight (range 0-1) x duration of disability (in years)

**Expected life remaining**

It is important to note that Vos et al (2007) estimated the life expectancy at birth of Indigenous Australians for the period 1996 to 2001 to be 64 years for males and 69 years for females, a gap of 12.5 and 13.5 years with life expectancy of the total Australian population, respectively. These life expectancy estimates are higher than those reported by the ABS for the same period. There is a scientific debate about the validity of either set of estimates that can only be resolved when new and better data and methods become available. If the ABS mortality figures had been adopted, the total Indigenous population burden of disease estimates would have been higher (since the ABS estimates a larger gap in life expectancy for the total Indigenous Australian population).

**Disability weights**

To calculate years of life lost due to disability, 'disability weights' are applied as per the equation above. A disability weight of one represents death, and a weight of zero represents a year of healthy life. The weights are derived from a survey of clinicians and public health experts. For example, according to the weighting system, on average, society judges a year with blindness (weight 0.43) to be preferable to a year with paraplegia (weight 0.57), and a year with paraplegia to be preferable to a year with unremitting unipolar major depression (weight 0.76) (Begg et al (2007)).

Source: Vos et al (2007) and Begg et al (2007).

**4.2 BURDEN OF DISEASE**

*The disease burden among Indigenous Australians occurred at a considerably higher rate at each age compared with the total Australian population. In 2003, the Indigenous Australian population made up 2.4% of the total Australian population; however, despite its much younger age structure, the Indigenous Australian population carried 3.6% of the total disease burden (Vos et al 2007).*

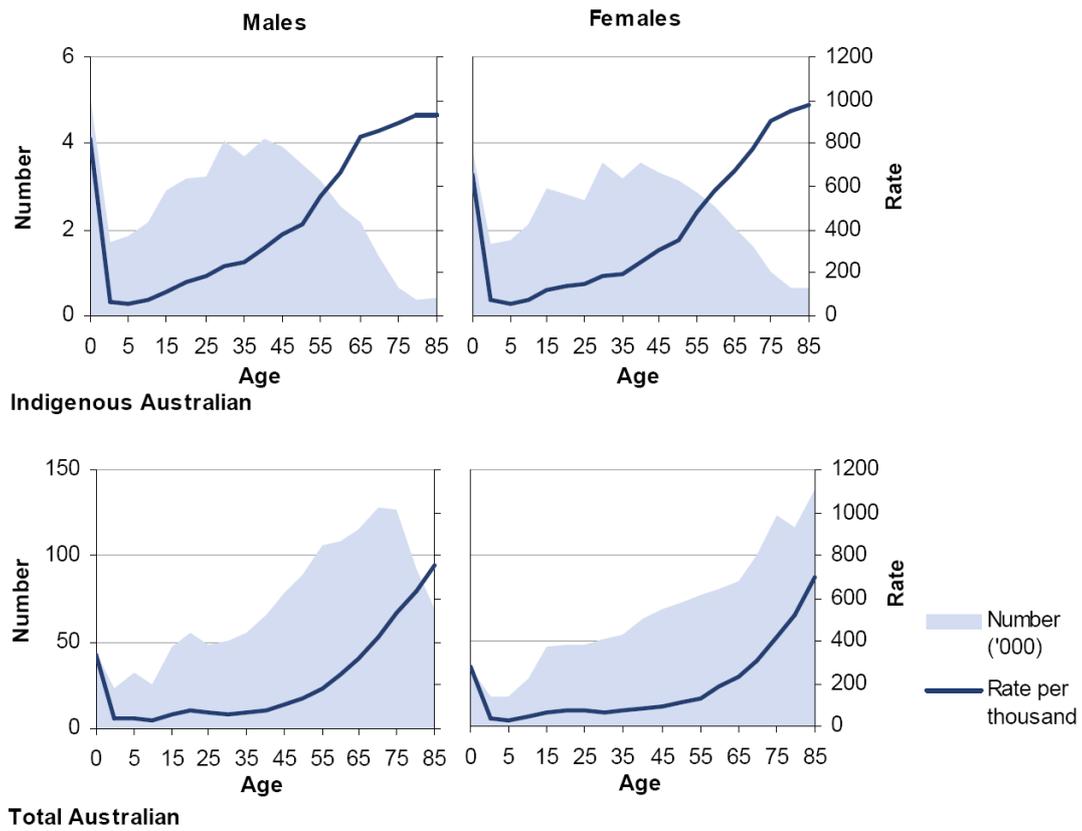
Among Indigenous people in 2003:

- ❑ cardiovascular disease and mental disorders (including substance use disorders) were the leading causes of disease burden, together accounting for 32% of the disease burden; and
- ❑ chronic respiratory disease, diabetes mellitus and cancers were the next three leading causes, accounting for around 8% each of the disease burden.

Comparisons of Indigenous health and total Australian population health can be made from the findings of Vos et al (2007).

- ❑ Cancer was responsible for a much smaller proportion of the disease burden among Indigenous people (19% total Australians compared with 8% among Indigenous people).
- ❑ Diabetes, and unintentional and intentional injuries were each responsible for a larger proportion of the total burden in Indigenous Australians than in the total Australian population.
- ❑ The proportion of the disease burden accounted for by premature death was higher among Indigenous Australians (54%) than for all Australians (49%) — once ill, Indigenous people are more likely to die prematurely than other Australians.
- ❑ Figure 4-1 (reproduced from Vos et al (2007)) depicts the differences in the distribution of the burden of disease by age. The majority of the absolute burden (the number of DALYs — on the left hand axis) for Indigenous Australians occurred in the middle-aged population with a significant peak also occurring in the very young. In the total Australian population, the absolute burden continued to increase into old age. DALYs per 1000 people (on the right hand axis) occurred at a considerably higher rate at each age for Indigenous Australians compared with the total Australian population.
- ❑ Table 4-1 (reproduced from Vos et al (2007)) shows the differences in the distribution of burden by condition between the Indigenous and total Australian populations. For Indigenous Australian males, otitis media, homicide and violence, birth trauma and asphyxia, and low birth weight caused substantially more of the disease burden than in the total Australian population. For Indigenous females, sexually transmitted diseases, homicide and violence, otitis media, and rheumatic heart disease were more important contributors to the burden of disease than for all Australian females.

**FIGURE 4-1 DALYS BY AGE AND SEX, INDIGENOUS AUSTRALIAN AND TOTAL AUSTRALIAN POPULATIONS, 2003**



Source: Vos et al, (2007)

**TABLE 4-1 RANK OF LEADING CAUSES OF DALYs, INDIGENOUS AUSTRALIAN AND TOTAL AUSTRALIAN POPULATIONS, 2003**

Condition	Males		Condition	Females	
	Indigenous Australian	Total Australian		Indigenous Australian	Total Australian
Ischaemic heart disease	1	1	Anxiety & depression	1	1
Type 2 diabetes	2	2	Type 2 diabetes	2	4
Anxiety & depression	3	3	Ischaemic heart disease	3	2
Suicide	4	8	Asthma	4	9
Road traffic accidents	5	12	COPD	5	7
COPD	6	6	Stroke	6	3
Alcohol dependence & harmful use	7	14	Road traffic accidents	7	22
Asthma	8	13	Alcohol dependence & harmful use	8	34
Stroke	9	5	Lung cancer	9	8
Homicide & violence	10	46	Homicide & violence	10	75
Low birth weight	11	37	Low birth weight	11	33
Lung cancer	12	4	Pneumonia	12	16
Pneumonia	13	21	Suicide	13	24
Inflammatory heart disease	14	32	Breast cancer	14	6
Heroin or polydrug dependence	15	24	Rheumatic heart disease	15	74
Schizophrenia	16	16	Deficiency anaemia	16	52
Epilepsy	17	36	Schizophrenia	17	19
Hepatitis	18	23	Otitis media	18	81
Birth trauma & asphyxia	19	54	Heroin or polydrug dependence	19	55
Otitis media	20	81	STDs (not HIV/AIDS)	20	86

Source: Vos et al, (2007)

#### 4.2.1 PREMATURE DEATH (YLL)

The leading causes of death of Indigenous Australians are in Table 4-2. Ischaemic heart disease was the largest cause of premature death among Indigenous people, followed by suicide for males and Type 2 diabetes for females. Road traffic injury was the third leading cause of premature death for males and females.

*The ranking of suicide [in the fatal disease burden] for Indigenous males and females (second and seventh respectively) was considerably higher than that for Australian males and females (seventh and twenty third, respectively). This was partly due to the younger age structure of the Indigenous Australian population, but particularly due to the increased incidence of suicide in the Indigenous Australian population, where it occurred at around three times the total Australian rate (Vos et al 2007:34).*

**TABLE 4-2 LEADING CAUSES OF PREMATURE DEATH (YLLS) OF INDIGENOUS AUSTRALIANS, 2003**

Rank	Males			Females		
	Condition	YLL	Per cent of total	Condition	YLL	Per cent of total
	<b>All Causes</b>	<b>28,904</b>	<b>100.0</b>	<b>All Causes</b>	<b>22,571</b>	<b>100.0</b>
1	Ischaemic heart disease	5,026	17.4	Ischaemic heart disease	2,995	13.3
2	Suicide	2,628	9.1	Type 2 diabetes	1,735	7.7
3	Road traffic accidents	1,786	6.2	Road traffic accidents	1,008	4.5
4	Type 2 diabetes	1,336	4.6	Stroke	932	4.1
5	Alcohol dependence & harmful use	1,125	3.9	Lung cancer	923	4.1
6	Lung cancer	971	3.4	COPD	807	3.6
7	Stroke	899	3.1	Suicide	783	3.5
8	COPD	864	3.0	Alcohol dependence & harmful use	758	3.4
9	Homicide & violence	802	2.8	Breast cancer	641	2.8
10	Pneumonia	711	2.5	Pneumonia	618	2.7
11	Inflammatory heart disease	584	2.0	Homicide & violence	561	2.5
12	Low birth weight	584	2.0	Low birth weight	509	2.3
13	Hepatitis	546	1.9	Rheumatic heart disease	455	2.0
14	Epilepsy	469	1.6	Hepatitis	389	1.7
15	SIDS	413	1.4	SIDS	342	1.5
16	Suffocation & foreign bodies	402	1.4	Nephritis & nephrosis	333	1.5
17	Nephritis & nephrosis	297	1.0	Cervical cancer	323	1.4
18	Drowning	290	1.0	Colorectal cancer	290	1.3
19	Poisoning	280	1.0	Inflammatory heart disease	271	1.2
20	Oesophagus cancer	277	1.0	Poisoning	250	1.1

Source: Vos et al (2007)

#### 4.2.2 YEARS LIVED WITH DISABILITY (YLD)

The leading causes of disability of Indigenous Australians are in Table 4-3. Anxiety and depression, Type 2 diabetes, and asthma were the leading causes of incident non-fatal burden for male and female Indigenous Australians. The top five conditions (these three, together with ischaemic heart disease and chronic obstructive pulmonary disease) accounted for 38.9% and 46.7% of male and female non-fatal burden respectively.

**TABLE 4-3 LEADING CAUSES OF YEARS LIVED WITH DISABILITY OF INDIGENOUS AUSTRALIANS, 2003**

Rank	Males			Females		
	Condition	YLD	Per cent of total	Condition	YLD	Per cent of total
	<b>All Causes</b>	<b>2,1202</b>	<b>100.0</b>	<b>All Causes</b>	<b>23,299</b>	<b>100.0</b>
1	Anxiety & depression	2,855	13.5	Anxiety & depression	4,582	19.7
2	Type 2 diabetes	2,183	10.3	Type 2 diabetes	2,626	11.3
3	Asthma	1,262	6.0	Asthma	1,718	7.4
4	COPD	1,077	5.1	Ischaemic heart disease	1,080	4.6
5	Ischaemic heart disease	872	4.1	COPD	872	3.7
6	Schizophrenia	695	3.3	Deficiency anaemia	619	2.7
7	Alcohol dependence & harmful use	672	3.2	Schizophrenia	558	2.4
8	Otitis media	515	2.4	Otitis media	493	2.1
9	Heroin or polydrug dependence	512	2.4	Stroke	481	2.1
10	Low birth weight	417	2.0	Migraine	426	1.8
11	Stroke	394	1.9	Dental caries	405	1.7
12	Dental caries	388	1.8	STDs (not HIV/AIDS)	373	1.6
13	Adult-onset hearing loss	370	1.7	Personality disorders	309	1.3
14	ADHD	324	1.5	Low birth weight	299	1.3
15	Birth trauma & asphyxia	316	1.5	Homicide & violence	293	1.3
16	Personality disorders	307	1.4	Heroin or polydrug dependence	264	1.1
17	Homicide & violence	300	1.4	Peripheral vascular disease	263	1.1
18	Neonatal infections	285	1.3	Alcohol dependence & harmful use	250	1.1
19	Peripheral vascular disease	280	1.3	Infertility	211	0.9
20	Cannabis dependence	243	1.1	Back pain	210	0.9

Source: Vos et al, (2007)

### 4.2.3 MORTALITY

Mortality in young and middle-aged Indigenous adults was particularly high (33% and 23% probability of dying between ages 15 and 60 years in males and females, respectively, compared with 10% and 6% in the total Australian population) (Vos et al (2007)).

The probability of dying before age five was 1.6% and 1.4% for males and females, respectively (compared with national figures of 0.7% and 0.6%) (Vos et al (2007)).

### 4.2.4 RISK FACTORS

The 11 risk factors considered (tobacco, alcohol, illicit drugs, high body mass, inadequate physical activity, low intake of fruit and vegetables, high blood pressure, high cholesterol, unsafe sex, child sexual abuse and intimate partner violence) together explained 37% of the total burden of disease experienced by Indigenous Australians.

Indigenous Australians experienced a higher rate of disease burden due to each of the 11 risk factors considered compared with the total Australian population. This resulted from a combination of higher prevalence of exposure to the risk factors and higher disease levels in

the population. The largest relative differences in rates of burden were for low fruit and vegetable consumption, tobacco, and high body mass.

### 4.3 EXCESS BURDEN OF DISEASE AMONG INDIGENOUS AUSTRALIANS

If Indigenous Australians had the same level of mortality and disability as the total Australian population, the total burden of disease would have been 59% lower (39,522 compared with 95,976 DALYs).

- ❑ Non-communicable diseases explained 70% of the health gap, with cardiovascular disease the leading cause group (23%), followed by diabetes (12%), mental disorders (12%) and chronic respiratory diseases (9%).
- ❑ The other 30% was accounted for by injuries (suicide, road traffic accidents and homicide and violence), communicable diseases, and maternal and neonatal conditions.

#### Prevention is important ...

If Indigenous Australians experienced the same burden rates as the total Australian population due to the 11 selected risk factors outlined above, 29% of the total Indigenous Australian burden of disease could be avoided. This is half of the overall Indigenous health gap of 59%. This indicates that there is potential to considerably reduce the disease and injury experience of all Indigenous Australians with interventions targeted at these risk factors.

#### ... as part of a multi-pronged approach

Once ill, Indigenous Australians have a higher chance of death. Australian literature suggests that late presentations, shortcomings in acute surgical and medical management, and poor follow-up during the course of disease contribute (Vos et al 2007). Improved health care, scientific and medical advances, environmental health (housing, water and utilities) and socioeconomic responses are just as critical as prevention in reducing the gap in the burden of disease.

## 5. CONCLUSIONS

The analysis in this report shows there are economy wide benefits to be achieved from improving the quality of life of Indigenous Australians. In a 'what if' scenario based on raising the life expectancy of Indigenous Australians commensurate with that of all Australians, and on increasing the proportion of the Indigenous population in the workforce and who are able to take on higher skilled and better paid jobs, real GDP could be 1% higher than otherwise — equivalent to around \$10 billion. Further, since the increase in GDP is larger than the forecast increase in the total population, national living standards for all Australians will increase. There is therefore a clear economic justification for government action to reduce Indigenous disadvantage.

The economic benefits will only be realised if the health and educational attainment of Indigenous Australians improves. In fact the modelling outcomes are predicated on the many facets of Indigenous disadvantage that contribute to their poorer health and labour market outcomes being addressed. In another light, achieving the economic benefits implies an enhanced quality of life for Indigenous people — a reduction in the burden of disease and an improvement in the ability of Indigenous Australians to share in economic prosperity. These are generally not counted in economic indicators of progress but are nevertheless additional and no less important payoffs associated with the 'what if' scenario modelled here.

Foreshadowing the likely policies and programs required to achieve the economic benefits was out of scope for this project. However, the modelling and budget analysis facilitate discussion about how much governments can afford to spend to alleviate Indigenous disadvantage. The analysis of government budgets suggests that from 2029, there will be an additional \$8.3 billion available to governments each year if Indigenous disadvantage were alleviated. (Indigenous people would pay more tax and their public health, housing and justice system requirements would fall). Monitoring and evaluation are necessary accompaniments of such an approach. If potential future benefits are used to justify upfront investments in education and health infrastructure, interim targets for the health and education workforce and complementary infrastructure, in concert with interim objectives measured in terms of outcomes for Indigenous people — for example, child health and educational achievement — are vital in tracking whether the benefits are being achieved.

The Australian Government's current approach includes interim objectives to halve the literacy and numeracy achievement gap within a decade, halve the gap in employment outcomes within a decade, and provide Indigenous children with access to quality preschool programs within five years (Macklin, 2008). To some extent, these interim objectives are augmented with provisional infrastructure targets, although the latter could be strengthened with a view to increasing certainty that the potential economic benefits and improvements to Indigenous people's wellbeing will be achieved in the foreseeable future.

**Access Economics**  
**August 2008**

## 6. REFERENCES

- Abhayaratna J. and Lattimore R. 2006, *Workforce Participation Rates – How Does Australia Compare?*, Productivity Commission Staff Working Paper, Canberra
- ABS 2008a, *Average Weekly Earnings, Australia, Nov 2007*, cat. no. 6302.0, ABS, Canberra
- ABS 2008b, *Consumer Price Index, Australia: December 2007 Quarter*, cat. no. 6401.0, ABS, Canberra
- ABS 2007a, *Household Income and Income Distribution, Australia, 2005-06*, cat. no. 6523.0, ABS, Canberra
- ABS 2007b, *Schools, Australia, 2007*, cat. no. 4221.0, ABS, Canberra
- ABS 2006a, *Population Distribution, Aboriginal and Torres Strait Islander Australians*, cat. no. 4705.0, ABS, Canberra
- ABS 2006b, *Deaths, Australia*, cat. no. 3302.0, ABS, Canberra
- ABS 2006c, *Housing and Infrastructure in Aboriginal and Torres Strait Islander Communities*, cat. no. 4710.0, ABS, Canberra
- ABS 2006d, *Demography Working Paper 2004/3 – Calculating Experimental Life Tables for Use in Population Estimates and Projections of Aboriginal and Torres Strait Islander Australians, 1991 to 2001*, cat. no. 3106.0.55.003, ABS, Canberra
- ABS and AIHW 2005, *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples*, cat. no. 4704.0 ABS and AIHW, Canberra
- ABS 2004, *National Aboriginal and Torres Strait Islander Social Survey 2002*, cat. no. 4714.0, ABS, Canberra
- ABS 2004a, *Experimental Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 30 June 1991 to 30 June 2009*, cat. no. 3238.0, ABS, Canberra
- ABS 2003, *Population Characteristics, Aboriginal and Torres Strait Islander Australians, 2001*, cat. no. 4713.0, ABS, Canberra
- Access Economics 2004, *Indigenous health Workforce Needs*, A report by Access Economics for The Australian Medical Association, Canberra
- Access Economics 2005 *The Economic Benefit of Increased Participation in Education and Training* Report for the Business Council of Australia and Dusseldorf Skills Forum, Canberra
- Access Economics 2006, *Opal cost benefit analysis*, report by Access Economics for the Opal Alliance, Canberra
- Access Economics 2008, *Business Outlook December Quarter 2007*, Canberra.

- Australian Institute of Health and Welfare 2008, *Expenditures on health for Aboriginal and Torres Strait Islander peoples 2004–05, Health and welfare expenditure series no. 32*, Cat. no. HWE 40, AIHW, Canberra
- Australian Institute of Health and Welfare 2008a. Child protection Australia 2006–07. Child welfare series no. 43. Cat. no. CWS 31, AIHW, Canberra
- Australian Institute of Health and Welfare 2005, *Expenditures on Health for Aboriginal and Torres Strait Islander Peoples, 2001-02*, cat. no. HWE 30, AIHW, Canberra
- Begg S, Vos T, Barker B, Stevenson C, Stanley L, Lopez AD 2007, *The burden of disease and injury in Australia 2003*, PHE 82, AIHW, Canberra
- Business Council of Australia and Dusseldorp Skills Forum 2007 *Engaging our potential: the economic and social necessity of increasing workforce participation*, Melbourne
- Centrelink 2008, *Adjusting Maximum Payment Rates*, Centrelink, Canberra
- CHOICE 2007, Dental Care, Online <http://www.choice.com.au>, Sydney
- COAG 2007, *Council of Australian Governments' Meeting, Melbourne, 20 December 2007 Communique*, Council of Australian Governments, COAG, Canberra
- DEST 2006, *National Report to Parliament on Indigenous Education and Training, 2004*, Department of Education, Science and Training, Canberra
- DEWR 2008, *CDEP Guidelines 2007-07*, Department of Employment and Workplace Relations, Canberra
- FaCSIA 2007, *Northern Territory National Emergency Response – Summary Fact Sheet*, FaCSIA, Canberra
- HREOC (Human Rights and Equal Opportunity Commission) 1997. Bringing them home. Report of the national inquiry into the separation of Aboriginal and Torres Strait Islander children from their families. HREOC, Sydney
- Indian and Northern Affairs Canada 1996, *Report of the Royal Commission on Aboriginal Peoples*, Ottawa
- Keatsdale Pty Ltd 2003, Report into the cost of child abuse and neglect in Australia, Report for the Kids First Foundation
- Laplagne P., Glover M. and Shomos A. 2007, *Effects of Health and Education on Labour Force Participation*, Productivity Commission Staff Working Paper, Melbourne
- Macklin, The Hon Jenny MP, *Budget 2008-09: Closing the Gap Between Indigenous and non-Indigenous Australians*, FaHCSIA, Canberra
- Mooney G, Wiseman V, Jan S, 1998, How much should we be spending on health services for Aboriginal and Torres Strait Islander people? *Medical Journal of Australia*, 169:508-509
- NTBIPACSA Northern Territory Board of Inquiry into the Protection of Aboriginal Children from Sexual Abuse 2007, *Little Children are Sacred Report*, Darwin

- NTCMD 2007, *Closing the Gap of Indigenous Disadvantage*, Northern Territory Department of the Chief Minister, Darwin
- PM&C 2008, *Australia 2020 Summit: Media Release 3 February 2008*, Department of the Prime Minister and Cabinet, Canberra
- Productivity Commission, 2005, *Economic Implications of an Ageing Australia*, Research Report, Canberra.
- Productivity Commission 2007, *Potential Benefits of the National Reform Agenda (NRA)*, Report to the Council of Australian Governments, Canberra
- RBA 2008, *Statement on Monetary Policy – February 2008*, Reserve Bank of Australia, Sydney
- Steering Committee for the Review of Government Services Provision (SCRGSP) 2008, *Report on Government Services 2008, Volume 2*, Productivity Commission, Canberra
- Steering Committee for the Review of Government Service Provision (SCRGSP) 2007, *Overcoming Indigenous Disadvantage: Key Indicators 2007*, Productivity Commission, Canberra
- Taylor J. and Hunter B. 1998, *The Job Still Ahead: Economic costs of continuing Indigenous employment disparity*, Office of Public Affairs, ATSIC, Canberra
- Taylor J. and Stanley O. 2005, *The Opportunity Costs of the Status Quo in the Thamarrurr Region*, CAEPR Working Paper No. 28/2005, Centre for Aboriginal Economic Policy Research, Australian National University, Canberra
- Vos T., Barker B., Stanley L., Lopez A.D. 2007, *The Burden of Disease and Injury in Aboriginal and Torres Strait Islander Peoples 2003*, School of Population Health, The University of Queensland, Brisbane
- Young, Mandy 2006, *Breaking the silence, creating the future: addressing child sexual assault in Aboriginal communities in NSW*. In: *Positive Ways: an Indigenous Say: conference papers*, Victims of Crime NT, Darwin

## APPENDIX A: CALCULATION METHOD FOR PROJECTIONS OF GOVERNMENT BUDGET SCENARIOS

The method for calculating the impact on government budgets of improving Indigenous life expectancy, labour force participation and labour productivity is described here, using examples from each portfolio.

### TRENDS

In many cases, historical data were only available for very short time periods providing a small sample on which to base future trends.

The base year for forecasts is 2009. As the most recent data are for 2007, a price inflation index (3.5% for 2008 and 3.25% for 2009) was used to project average fortnightly welfare payments to 2009. This is consistent with the Reserve Bank of Australia's forecast CPI (RBA 2008).

### POPULATION PROJECTIONS

AE projections of the Indigenous age-specific population to 2026 were used as described in Chapter 2. To obtain population estimates to 2029, the following approaches were adopted for each of the two population sets;

- ❑ Indigenous status quo population – forecasted based on the average annual growth rate on the Indigenous population for the 20 years to 2026.
- ❑ Indigenous 'what if' scenario population – forecasted based on the average annual growth for the national population for the three years to 2029<sup>10</sup>. Under this scenario, the Indigenous population age-specific life expectancy mortality has reached national average. While there is still some discrepancy in the age distributions of the two populations, the gap is closing and thus it is reasonable to assume that the growth rates of the cohorts are consistent over the short-term, three year period.

## WELFARE

### NEWSTART ALLOWANCE

Recipient numbers and the proportions of Indigenous recipients, together with expenditure data were obtained from the DEEWR and FaHCSIA administrative databases and Treasury Portfolio Budget papers. Per capita expenditures were derived based upon the different eligibility ages. From these, time series were derived for Indigenous recipient numbers, average per capita expenditure and average Indigenous per capita expenditure, and average fortnightly spend per recipient. An example of the method of calculation for expenditure on Newstart is provided here.

*2007 Newstart recipients: 468,813, of whom 7.3% were Indigenous.*

*Indigenous recipients:  $468,813 * 0.073 = 34,289$*

<sup>10</sup> AE projections of the national population extend out to 30 June 2101.

2007 Newstart expenditure (\$'000): \$5,103,884

Average per capita expenditure (population aged 21 to 64):  $\$5,103,884,000 / 12,455,073 = \$409.78$

Average Indigenous per capita expenditure (population aged 21 to 64):  $\$5,103,884,000 * 0.073 / 247,549 = \$1,507.98$

Average fortnightly expenditure per recipient:  $\$5,103,884,000 / 468,813 = \$419$

The historical data for all programs except CDEP extends to 30 June 2007. Historical average annual growth rates for recipient numbers (Indigenous and total) were used to forecast to 2009. Forecasts for average fortnightly benefit per recipient had the spend rates indexed to CPI (and set to a minimum of 25% of male full-time average weekly earnings (ABS 2008a) where applicable) – consistent with Centrelink applied policies relating to increments on maximum payment rates<sup>11</sup>. Total annual expenditure forecasts were derived from the resultant 2009 figures for average fortnightly spend per capita and total recipient numbers.

Centrelink forecast increases in benefits: 2008 = 1.035, 2009 = 1.033

2009 forecast average fortnightly payment, Newstart:  $\$419 * 1.035 * 1.033 = \$447.46$

2009 total expenditure on Newstart:  $\$447.46 * 405,136 = \$4,713,384,000$

2009 Average per capita expenditure:  $\$4,713,384,000 / 12,820,200 = \$367.65$

2009 Average Indigenous per capita expenditure:  $\$4,713,384,000 * 0.086 / 260,335 = \$1,551.14$

The base case for 2029 multiplies population projections for 2029 by the estimates of 2009 Indigenous per capita expenditure. The 'what if' scenario is calculated assuming that Indigenous life expectancy, labour force participation and labour productivity approach the national average. These two figures are then compared to arrive at the annual savings to the government.

2029 Newstart base case:  $\$1,551.14 * 405,648 = \$629.2 \text{ million}$

2029 Newstart 'what if' scenario:  $\$367.65 * 425,548 = \$156.5 \text{ million}$

2029 Projected savings:  $\$629.2 \text{ million} - \$156.5 \text{ million} = \$472.8 \text{ million}$ <sup>12</sup>

## CDEP

CDEP (Indigenous and total) recipient numbers for 2009 are as per Section 2.5.3. The average per participant fortnightly payment rate (DEWR 2008) was available for the 2008 financial year. These rates were indexed to CPI to obtain 2009 forecasts. Four different fortnightly rates apply depending on the participant's remoteness (remote, non-remote) and age (youth, adult). The proportion of each type of participant was obtained from DEEWR administrative database figures for total CDEP participants by age and by remoteness. Total

<sup>11</sup> Centrelink 2008

<sup>12</sup> Numbers may not add due to rounding

annual expenditure is then a function of fortnightly rates applied to recipient numbers by type of participant. To calculate the correct CDEP youth population AE estimated that 4.7% of the Indigenous population under the age of 20 is a custodial parent or guardian. The Indigenous health and welfare report (ABS and AIHW 2005) showed that 21% of Indigenous mothers (2000-2002) were less than 20. There were 26,128 reported Indigenous mothers over the same period. Assuming a consistent paternal age pattern (i.e. 21% of corresponding 26,128 Indigenous fathers were also less than 20) and dividing by the Indigenous population less than 20 as at 2001 (the average population over the 2000 to 2002 reporting period), results in the 4.7% estimate.

## HEALTH

### Pharmaceuticals

Historical 2004-05 data for State and Federal Government expenditure by broad health service and Indigenous proportional expenditure were obtained from the AIHW health expenditure report (AIHW 2008). The same report provided an estimate for the national average real inflation per annum on government health expenditure (2.3% p.a. real, 4.8% p.a. nominal). AE estimated a corresponding Indigenous real inflation per annum on government health expenditure based on a time series of average health expenditure per Indigenous person (2.8% p.a. real, 5.3% p.a. nominal). The 2004-05 data was then inflated by the nominal health expenditure inflation per annum to forecast government health expenditure per capita and per Indigenous capita in 2009 dollar terms.

Total expenditure on pharmaceuticals in 2004-05 was \$6,051 million, of which 1.2% was on Indigenous people.

*2004-05 expenditure per Australian on Pharmaceuticals:  $\$6,051,100,000 / 20,399,836 = \$296.62$*

*2004-05 expenditure per Indigenous person on Pharmaceuticals:  $\$6,051,100,000 * 0.012 / 505,229 = \$143.10$*

*2009 expenditure per Indigenous person on Pharmaceuticals:  $\$143.10 * (1+6.2\%)^4 = \$182.03$*

*2009 Australian expenditure per capita on Pharmaceuticals:  $\$296.62 * (1+5.9\%)^4 = \$372.57$*

For the base case projection of expenditure in 2029, Indigenous per capita expenditure remains at 2009 levels, but the population changes in line with current life expectancy estimates.

*2029 Base case expenditure on Pharmaceuticals for Indigenous people:  $\$182.03 * 798,770 = \$145,402,000$*

The 'what if' scenario is introduced involving a higher Indigenous population (due to an increase in life expectancy), and a change in per capita expenditure for Indigenous people that matches the Australian average in 2029.

*2029 Indigenous 'what if' scenario expenditure on Pharmaceuticals:  $\$372.57 * 843,058 = \$314,101,000$*

Government expenditure in 2029 is higher under the 'what if' scenario — a dissaving: \$145.4 million - \$314.1 million = -(\$168.7 million)

## EDUCATION

### Caveats and Assumptions

- ❑ The *Overcoming Indigenous Disadvantage* report (SCRGSP 2007) was used as the primary data source for participation rates. However, to achieve a more detailed time series, the ABS *Schools* (ABS 2007b) and *Indigenous Training and Development* (DEST 2006) reports were also incorporated:
  - Where possible, data were reconciled against the SCRGSP figures and where discrepancies were found, the calculated adjustment factor (required to correct the discrepancies) was applied to the secondary data sources throughout the relevant time series.
  - Where direct reconciliation was not possible, judgement was applied as to the accuracy – and thus, required adjustments - of the secondary data sources.
  - Any discrepancy observed amongst the combined data sources was broadly insignificant
- ❑ Historical total education expenditure (SCRGSP 2007b) was quoted as real amounts in 2005-06 dollar terms. To derive a nominal time series, the base time series was discounted by an average annual real growth rate of 3.0% per annum (SCRGSP 2007b) relating specifically to operating expenditure net of transfers on education.
- ❑ Funding for Indigenous specific educational programs is expected to continue and increase in line with population increases due to the life expectancy 'what if' scenario. Thus, results in an additional cost to the Federal Government expenditure budget.

### Primary and Secondary Education

The impact on education expenditure was modelled based on historical participation rates (SCRGSP 2007, ABS 2007b, DEST 2006) of Indigenous students compared to all students by level of schooling. A corresponding combined State and Commonwealth Government expenditure per student time series for each level of schooling was derived from the 2007 Indigenous Compendium for Government Services (SCRGSP 2007b) total expenditure amounts. Average annual growth rates per annum were applied to the historical data to calculate projections to 2009 for participation and expenditure per capita.

For the 2029 base case, it is assumed that Indigenous education participation rates remain constant at 2009 participation rates, and thus the only change is the natural increase in the population. Participation rates are applied to the relevant age bracket and expenditure per capita to derive 2029 base case expenditure on Indigenous education by level of schooling.

*2029 base case on primary and secondary education: Cost per capita: \$9,206; Indigenous participation rate: 84.5%*

*Indigenous population aged 5-18: 219,898*

*2029 base case total expenditure on primary and secondary education: \$9,206 \* 84.5% \* 219,898 = \$1,710,412,000*

The 'what if' scenario involves an increase in life expectancy and Indigenous education participation rates equivalent to the national average in 2029. With the exception of VET, this involves an increase in Indigenous participation rates. Indigenous participation in VET falls from 17.8% to 7.2% (the national average). The cost per capita of providing each level of education remains unchanged.

2029 'what if' scenario on primary and secondary education: Participation rate: 87.3%; Indigenous population aged 5-19: 227,169

2029 'what if' scenario total expenditure on primary and secondary education:  $\$9,206 * 87.3\% * 227,169 = \$1,825,006,000$

The total potential saving or dissaving from each level of education is then derived by subtracting the 'what if' scenario result from the base case result.

Dissaving in 2029 compared with base case:  $\$1,710,412,000 - \$1,825,006,000 = -(\$114,595,000)$

### **Austudy and Abstudy**

Total recipient numbers for each program for 2005-2007 were obtained from DEST Annual Reports, and the proportion of recipients for each program who identify as Indigenous were obtained from the DEWR administrative database. Average growth rates were derived from three years of data, and were used to extrapolate total and Indigenous recipient numbers and total expenditure to 2009. Average Indigenous and total per capita expenditure in 2009 were then determined from these results. Owing to restrictions on eligibility ages for receiving study support, only the populations aged 16 years and over are used for these calculations. Base case projections for 2029 were calculated based on average per capita expenditure on Indigenous Australians remaining constant at 2009 levels, and only the population size changing. In the 'what if' scenario, however, convergence between the two programs was assumed; that is the Abstudy Indigenous participation rate moves towards the Austudy average participation rate and Austudy Indigenous participation rate moves towards Abstudy average participation rate.

## **JUSTICE**

### **SECURE PRISONERS**

Calculations for the justice figures in this report are based on state-level data. Average prisoner populations per day by Indigenous status are available for each state by type of correction for 2003-2007. Average cost per prisoner per day for each state by type of correction data is used to calculate total cost of prisoners by type for each year, for example with the 1,249 Average Indigenous Secure Prisoners per day in NSW prisons in 2007:

*2007 Average Cost per Secure Prisoner per day:*

*$\$268.50$  (Average Capital Costs per day plus Net Recurrent Costs per day)*

*2007 Total Annual Cost of Indigenous Secure Prisoners in NSW:*

*$1,249 * \$268.50 * 365 = \$122.4$  million*

This process was repeated for all prisoner types and all states. The numbers for which Indigenous status was unknown were relatively small, however these cases were assumed to be non-Indigenous.

2003-2007 estimated total expenditure was used to derive annual growth rates over this period, and these growth rate estimates were used to derive projections for annual costs in 2009:

*2009 Total Annual Cost of Indigenous Secure Prisoners in NSW:*

$$\$122.4 \text{ million} * (109\%)^2 = \$144.9 \text{ million}$$

Figures for each correction type by Indigenous status are then summated for all the States and Territories to produce a national figure. This produces a total projected cost of secure Indigenous prisoners for Australia in 2009 of \$441.8 million. Using the total population aged 15 years and over, per capita expenditure on prisoners by correction type is derived for the Indigenous and total Australian populations:

*2009 per capita expenditure, Secure Indigenous Prisoners:*

$$\$441.8 \text{ million} / 354,870 = \$1,245 \text{ per Indigenous person aged 15+}$$

The base case for 2029 assumes no life expectancy 'what if' scenario, and that this per capita expenditure on Indigenous justice holds:

*2029 total expenditure, Secure Indigenous Prisoners (base case):*

$$\$1,245 * 537,244 = \$668.9 \text{ million}$$

The 'what if' scenario for 2029 assumes a life expectancy change, and also that per capita expenditure on Indigenous justice by correction type falls to meet the national average:

*2029 total expenditure, Secure Indigenous Prisoners ('what if' scenario):*

$$\$104 * 573,694 = \$59.9 \text{ million}$$

The difference between these two figures gives us potential justice savings from the closing of the Indigenous development gap:

$$\$668.9 \text{ million} - \$59.9 \text{ million} = \$608.9 \text{ million}^{13}$$

## HOUSING

### Caveats and Assumptions

To estimate the number of persons affected (Indigenous and total) based on household numbers historical data, the model estimates the number of persons per *community housing* household (expected to be higher than for all households).

- ❑ The Indigenous figure of 7.1 persons per household was derived from the Indigenous community housing data (SCRGSP 2007b) which quoted both number of persons and number of households and used consistently throughout housing programs.
- ❑ The national average figure of 5.4 persons per household was derived by applying a factor to the known Indigenous figure. The factor is equivalent to the proportional difference in average household size between total households and households with Indigenous persons from the 2006 Census.

<sup>13</sup> Numbers here may not add due to rounding.

## Community Housing

Data on government expenditure on Housing provision was obtained from the Productivity Commission's Review of Government Service Provision (SCRGSP 2008). For most of the programs included, data was available for each year in the period 2003-2007, however for Indigenous Community Housing only 2006 data was available, and estimates on growth rates were based on those of National Community Housing. Also available from this report were total Indigenous Households in each of these projects and total households.

Annual growth rates of households receiving assistance are calculated, and these annual growth rates are used to estimate the Indigenous and total households projected to be receiving assistance in 2009. The proportion of Indigenous and total households receiving each type of assistance were then derived by applying a known household size average for assisted Indigenous households and an estimate for total assisted households to find total Indigenous persons receiving assistance:

*National Community Housing Indigenous Households in 2009: 1,996*

*Number Indigenous persons receiving assistance:*

$$1,996 * 7.13 = 14,228$$

*% Indigenous population:*

$$14,228 / 547,954 = 2.6\%$$

The total cost of providing assistance for each type is found by multiplying net recurrent costs per dwelling by total dwellings, and the cost of providing assistance per Indigenous dwelling is then found by multiplying total spend by the proportion of total households receiving assistance which are Indigenous.

Two forecasts for 2029 are produced. The first is a base case where the proportion of Indigenous Australians receiving each type of housing support is held constant at 2009 levels; in this case only the size of the population changes. Net recurrent cost per dwelling is also held constant at 2009 levels:

*Base case National Community Housing Expenditure, Indigenous Households 2029:*

$$2,910 \text{ (households)} * \$8,281 \text{ (cost)} = \$24.1 \text{ million}$$

In the 2029 'what if' scenario, there is an increase in life expectancy for Indigenous Australians, and the proportion of Indigenous Australians receiving each type of household assistance is assumed to fall to the national average:

*'What if' scenario National Community Housing Expenditure, Indigenous Households 2029:*

$$0.9\% * 843,058 = 7,578 \text{ persons} / 5.42 = 1,063 \text{ households}$$

*Total Cost:*

$$1,063 * \$8,281 = \$8.8 \text{ million}$$

Estimated impact on government budgets is derived using these two figures:

$$\$24.1 \text{ million} - \$8.8 \text{ million} = \$15.3 \text{ million}$$

## COMMONWEALTH RENT ASSISTANCE

2006 and 2007 data on Indigenous and total persons receiving rental assistance from the Productivity Commission (SCRGSP 2008) are used to calculate the proportion of each population aged 15 years and over receiving rental assistance. The growth rate in recipients between these two years is extrapolated to estimate total persons receiving rental assistance in 2009, and hence the proportion of Indigenous persons and total Australians receiving assistance.

Average fortnightly entitlement for 2007 is known, and the rate at which this grows is assumed to be the same rate as housing sector inflation. Consequently an inflation rate of 3.7% (ABS 2008b) is applied to this to reach a 2009 estimate of average fortnightly entitlement, which is then held as the value of the fortnightly entitlement for 2029.

To calculate the 2029 base result, the proportion of the Indigenous population receiving Commonwealth Rental Assistance is held constant, and this rate is applied to the forecast Indigenous population aged 15 years or over to reach total recipients, then multiplied by the 2009 average fortnightly entitlement. The fortnightly result is then adjusted to an annual figure.

For the 2029 'what if' scenario result, it is assumed that the proportion of the Indigenous population receiving Commonwealth Rental Assistance falls to the 2009 national average rate of 5.4%. This rate is applied to the forecast 'what if' scenario Indigenous population aged 15 years or over, and the same methodology followed to reach annual Commonwealth Rental Assistance to Indigenous Australians. The 'what if' scenario population is then subtracted from the base result to find the impact on the government budget.

## APPENDIX B: DIFFERENCES IN ESTIMATES OF THE LIFE EXPECTANCY GAP BETWEEN INDIGENOUS PEOPLE AND ALL AUSTRALIANS

This report contains various different estimates of the life expectancy gap between Indigenous people and all Australians. First, differences between ABS and Access Economics estimates of the life expectancy gap arise because of differences in the time periods on which the all Australian comparator are based as follows (and summarised in Table 6-1):

- ❑ The commonly cited gap of 17 years (cited in the Overcoming Indigenous Disadvantage Report (OID)) is arrived at using Indigenous life expectancies based on 1996-2001 Census data with all Australian life expectancies based on 1998-2000 data.
- ❑ The ABS (2004a) suggests the gap is 18 years. The ABS (2004a) estimated the life expectancy at birth for people of Indigenous origin born in the period 1996-2001 was 59.4 years for males and 64.8 years for females and compared this with the life expectancy for all Australian males and females of 76.2 years and 81.8 years respectively for persons born in the period 1997–1999, and 77.4 years and 82.6 years respectively for persons born in the period 2000–2002. The ABS (2004) concluded that,

*This indicates that the life expectancy of Indigenous population is approximately 18 years less than that of the total Australian population (ABS (2004a:15)).*

- ❑ For this project, while as previously discussed, the life expectancy at birth of Indigenous Australians is assumed constant based on the estimates from ABS (2004a), the life expectancy at birth for all Australians is updated to more recent ABS estimates. For all Australian males and females, the ABS (2006b) estimated that the life expectancy at birth for those born in the period 2004-2006 was 78.7 years and 83.5 years respectively. Based on these updated data, in 2007, the gap in life expectancy between Indigenous people and all Australians is approximately 19 years.

**TABLE 6-1 DIFFERENCES IN THE ABS AND AE LIFE EXPECTANCY GAP ESTIMATES**

	Indigenous Australians  1996-2001	ABS Estimates 2000-2002		All Australians OID Estimates 1998-2000		AE Estimates 2004-2006	
		LE	Gap	LE	Gap	LE	Gap
Male	59.4	77.4	18	76.6	17.2	78.7	19.3
Female	64.8	82.6	17.8	82	17.2	83.5	18.7

Second, there are differences in life expectancy estimates of the ABS (2004a) and Vos et al (2007) — the latter using 2001 Census data and a different methodology to estimate a life expectancy gap of 13 years. These different gap estimates arise because different methods are used to adjust for incomplete coverage of Indigenous deaths and for changes in the rate at which Indigenous Australians are identified over time in Censuses.

The ABS (2004a) uses 1996-2001 mortality data, while Vos et al (2007) used 2000-2002 data (the latter arguing that their data better represent the mortality of respondents to the 2001 Census). Between the 1996 and 2001 Censuses, there was a recorded increase in the Indigenous population of 51,000 persons (16%). The ABS estimated that a 12% population increase could be explained by natural causes (births and deaths). However, assumptions about the factors driving the remaining 4% lead to different methods of adjustment to mortality profiles. According to Vos et al (2007), the methods used by the ABS and Vos et al, (2007) are similar in most respects except they make different assumptions about the distribution of the population that constitutes the 4% unexplained inter-census growth. In particular, the method used by Vos et al, (2007) assumes that the changing propensity to declare oneself as Indigenous is approximately constant across age groups.