A Statistical appendix

CONTENTS

**Indigenous data in the Statistical appendix A.2**

**Population A.2**

**Population, by ethnicity and proficiency in English A.3**

**Indigenous population profile A.4**

**Income A.4**

**Educational attainment A.5**

**Statistical concepts used in the Report — reliability of estimates A.7**

**Variability bands A.7**

**Statistical concepts used in the Report — age standardisation of data A.9**

**Rationale for age standardisation of data A.9**

**Calculating age standardised rates A.9**

**Calculating age standardised ratios A.13**

**New developments in age standardisation techniques A.13**

**List of attachment tables A.15**

**References A.16**

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| Attachment tables |
| Attachment tables are identified in references throughout this Indigenous Compendium by an ‘A’ prefix (for example, in this chapter, table AA.1). As the data are directly sourced from the 2013 Report, the Compendium also notes where the original table, figure or text in the 2013 Report can be found. For example, where the Compendium refers to ‘2013 Report, p. A.1’ this is page 1 of appendix A of the 2013 Report, and ‘2013 Report, table AA.1’ is attachment table 1 of attachment AA of the 2013 Report. A list of attachment tables referred to in the Compendium is provided at the end of this chapter, and the full attachment tables are available from the Review website at www.pc.gov.au/gsp. |
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The Statistical appendix in the *Report on Government Services 2013* (2013 Report) contains contextual information to assist the interpretation of the performance indicators presented in that Report. Data are presented for Indigenous people for some items — those data are compiled and presented here. The 2013 Report Statistical appendix also contains a discussion of the statistical concept of age standardisation and its application to prisoner population rates, and to death rates, for Indigenous and non‑Indigenous people.

Most of the service areas covered by the 2013 Report use estimated resident population (ERP) data from tables AA.1 and AA.2 in the 2013 Report for descriptive information (such as expenditure per person in the population) and performance indicators (such as participation rates for vocational education and training [VET]).

### Indigenous data in the Statistical appendix

The Statistical appendix in the 2013 Report contains the following data items for Indigenous people:

* people by country of birth
* people by language spoken at home
* estimated resident Australian Indigenous population, by age and sex
* language spoken at home by Indigenous Australians and proficiency in spoken English, by sex
* families and people in families in occupied private dwellings by Indigenous status and family/household composition
* people aged 15 years or over by weekly individual income and Indigenous status
* highest level of schooling completed by people aged 15 years or over, by Indigenous status (excluding people still attending secondary school)
* type of educational institution attending by Indigenous status.

### Population

More than three quarters of Australia’s 22.6 million people lived in the eastern mainland states as at 30 June 2011, with NSW, Victoria and Queensland accounting for 32.3 per cent, 24.9 per cent and 20.3 per cent, respectively, of the nation’s population. Western Australia and SA accounted for a further 10.4 per cent and   
7.3 per cent, respectively, while Tasmania, the ACT and the NT accounted for the remaining 2.3 per cent, 1.6 per cent and 1.0 per cent, respectively (2013 Report, table AA.1). As the majority of Australia’s population lives in the eastern mainland states, these jurisdictions generally have a large influence on national averages.

As in most other developed economies, greater life expectancy and declining fertility have contributed to an ‘ageing’ of Australia’s population. However, the age distribution of Indigenous Australians is markedly different (figure A.1).   
At 30 June 2011, 9.5 per cent of Australia’s population was aged 70 years or over, compared with just 1.9 per cent of Australia’s Indigenous population, as at   
30 June 2012 (table AA.15 and 2013 Report, table AA.1). Across jurisdictions, the proportion of all people aged 70 years or over ranged from 11.3 per cent in SA to 3.3 per cent in the NT (2013 Report, table AA.1).

Figure A.1 Population distribution, Australia, by age and sex, 30 June**a, b**

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| **All people (2011)** | **Indigenous (2011)** |
| Figure A.1 Population distribution, Australia, by age and sex, 30 June 2011 - All people  More details can be found within the text surrounding this image. | Figure A.1: Population distribution, Australia, by age and sex, 30 June 2011 - Indigenous  More details can be found within the text surrounding this image. |

a Includes other territories. b ERP data are preliminary, based on the *2011 Census of Population and Housing*.

*Source*: ABS (2011) *Australian Demographic Statistics, June 2011*, Cat. no. 3101.0; ABS (2012) *Australian Demographic Statistics, March 2012*, Cat. no. 3101.0; table AA.15 and 2013 Report, AA.1; 2013 Report,   
figure A.1, p. A.3.

### Population, by ethnicity and proficiency in English

In the NT, 16.3 per cent of people spoke an Australian Indigenous language at home (26.7 per cent of the total people in the NT spoke a language other than English in their homes) (table AA.11).

### Indigenous population profile

There were an estimated 669 736 Indigenous Australians (335 788 female and   
333 948 male) in Australia at 30 June 2011, accounting for approximately   
3.0 per cent of the total population (table AA.15 and 2013 Report, table AA.1). The proportion of people who identified as Indigenous was significantly higher in the NT (29.9 per cent) than in any other jurisdiction. Across the other jurisdictions, the proportion ranged from 4.7 per cent in Tasmania to 0.8 per cent in Victoria   
(figure A.2). Nationally, the Indigenous population is projected to grow to 721 064 people in 2021 (table AA.16).

The majority of Indigenous Australians (82.8 per cent) at August 2011 spoke only English at home, while a further 9.0 per cent spoke an Indigenous language and also spoke English very well or well. However, 1.8 per cent did not speak English well or at all (up to 12.1 per cent in the NT) (table AA.19).

Figure A.2 Indigenous Australians as a proportion of the population,   
30 June 2011**a, b**

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| Figure A.2 Indigenous Australians as a proportion of the population, 30 June 2011  More details can be found within the text surrounding this image. |

a ‘Australia’ includes other territories. b Estimates of the total Australian and the Australian Indigenous populations at 30 June 2011 are preliminary based on the *2011 Census of Population and Housing*.

*Source*: ABS (2011) *Australian Demographic Statistics, June 2011*, Cat. no. 3101.0; ABS (2012) *Australian Demographic Statistics, March 2012*, Cat. no. 3101.0; table AA.15 and 2013 Report, AA.1; 2013 Report,   
figure A.5, p. A.7.

### Income

Nationally in August 2011, 25.9 per cent of people aged 15 years or over had a relatively low weekly individual income of $299 or less (2013 Report,   
table AA.33). The proportion was considerably higher for younger people   
(74.8 per cent for people aged 15–19 years) and Indigenous Australians   
(37.2 per cent), similar for females (30.4 per cent) and slightly lower for older people (20.7 per cent for people aged 85 years or over) (figure A.3).

Figure A.3 Weekly individual income of $299 or less, by sex, Indigenous status and age, 2011a

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| Figure A.3  Weekly individual income of $299 or less, by sex, Indigenous status and age, 2011  More details can be found within the text surrounding this image. |

a ‘Australia’ includes other territories.

*Source*: ABS (2012) *2011 Census of Population and Housing*, *Australia, States and Territories, Basic Community Profile, Table B17 — Total personal income (weekly) by age by sex*, Cat. no. 2001.0, Canberra; ABS (unpublished) *2011 Census of Population and Housing*, *Australia*, Table generated on 3/10/2012 using ABS TableBulider; table  AA.36 and 2013 Report, tables AA.33 and AA.39; 2013 Report, figure A.8, p. A.11.

### Educational attainment

Employment outcomes and income are closely linked to the education and skill levels of individuals. At August 2011, 49.2 per cent of people aged 15 years or over (approximately 8.2 million people) had completed year 12. A further 20.9 per cent (3.5 million people) had a highest level of schooling of year 10. Across jurisdictions, the proportion of people aged 15 years or over who had completed year 12 schooling ranged from 69.1 per cent in the ACT to 36.5 per cent in Tasmania (2013 Report, figure A.10).

At August 2011, 52.1 per cent of non-Indigenous Australians aged 15 years or over had completed year 12 as their highest year of school (that is, the highest level of primary or secondary school a person has completed), compared with 25.0 per cent of Indigenous Australians aged 15 years or over. Across jurisdictions, the proportions of Indigenous Australians aged 15 years or over who had completed year 12 schooling ranged from 46.0 per cent in the ACT to 14.0 per cent in the NT. The proportion of non‑Indigenous Australians who had completed year 12 schooling was highest in the ACT (72.1 per cent) and lowest in Tasmania   
(38.2 per cent) (figure A.4).

Figure A.4 Proportion of people aged 15 years or over who have completed year 12, by Indigenous status, 2011a, b, c, d

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| Figure A.4 Proportion of people aged 15 years or over who have completed year 12, by Indigenous status 2011  More details can be found within the text surrounding this image. |

a ‘Australia’ includes other territories. b Includes people who did not state their highest year of school completed. **c** Includes ‘Aboriginal’, ‘Torres Strait Islander’ and ‘both Aboriginal and Torres Strait Islander’ people. d Data for highest level of schooling completed by people aged 15 years or over (excluding people still attending secondary school).

*Source*: ABS (2012) *2011 Census of Population and Housing*, *Australia, Aboriginal and Torres Strait Islander People (Indigenous) Profile, Table I06 — Highest year of school completed by Indigenous status by sex*, Cat. no. 2002.0, Canberra; table AA.43; 2013 Report, figure A.11, p. A.14.

In August 2011, the proportion of Indigenous students who were attending TAFE was 5.9 per cent, nationally, It was highest in the ACT (10.0 per cent) and lowest in the NT (2.3 per cent). The proportion of non-Indigenous students attending university (17.0 per cent) was considerably higher than the proportion of Indigenous students (4.5 per cent). Across jurisdictions, the proportion of non-Indigenous students attending university ranged from 27.7 per cent in the ACT to 13.7 per cent in Tasmania. For Indigenous students the proportion ranged from 13.3 per cent in the ACT to 2.2 per cent in the NT (figure A.5).

Figure A.5 Proportion of students attending tertiary education institutions, by Indigenous status, 2011a

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| Figure A.5 Proportion of students attending tertiary education institutions by Indigenous status, 2011  More details can be found within the text surrounding this image. |

TAFE = Technical and further educational institution. a ‘Australia’ includes other territories.

*Source*: ABS (2012) *2011 Census of Population and Housing*, *Australia, Aboriginal and Torres Strait Islander People (Indigenous) Profile, Table I05 — Type of educational institution attending (full/part-time student status by age) by Indigenous status by sex*, Cat. no. 2002.0, Canberra; table AA.46; 2013 Report, figure A.13,   
p. A.16.

### Statistical concepts used in the Report — reliability of estimates

*Variability bands*

Variability bands accompanying mortality data should be used for the purpose of comparisons at a point in time and over time (box A.1). They should not be used for comparing mortality rates at a single point in time between jurisdictions as the variability bands and mortality rates do not take into account differences in under‑identification of Indigenous deaths between jurisdictions.

Rates derived from administrative data counts are not subject to sampling error but might be subject to natural random variation, especially for small counts. A   
95 per cent confidence interval for an estimate is a range of values which is very likely (95 times out of 100) to contain the true unknown value. Where the confidence intervals do not overlap it can be concluded that there is a statistically significant difference between the two estimates compared (as detailed in the previous section).

Typically in this standard method, the observed rate is assumed to have natural variability in the numerator count (for example, deaths, hospital visits) but not in the population denominator count. Variations in Indigenous death rates may arise from uncertainty in the recording of Indigenous status on the death registration forms (in particular, under-identifications of Indigenous deaths) and in the *Census of Population and Housing*, from which population estimates are derived. These variations are not considered in this method. Also, the rate is assumed to have been generated from a normal distribution (2013 Report, figure A.15). Random variation in the numerator count is assumed to be centred around the true value — that is, there is no systematic bias.

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| Box A.1 **Technical concepts and formulas — variability bands** |
| **Variability bands**  The variability bands to be calculated using the standard method for estimating  95 per cent confidence intervals are:  *Crude rate (CR)*  (equation A.7)  Where:  is the numerator of the estimated proportion  *Age-standardised rate (ASR)*  (equation A.8)  Where:  is the proportion of the standard population in age group  is the number of deaths in age group  is the number of people in the population in age group .  *Infant mortality rate (IMR)*  (equation A.9)  Where:  is the number of deaths in infants aged less than 1 year. |
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### Statistical concepts used in the Report — age standardisation of data

#### Rationale for age standardisation of data

The age profile of Australians varies across jurisdictions, periods of time, geographic areas and/or population sub-groups (for example, between Indigenous and non-Indigenous populations). Variations in age profiles are important because they can affect the likelihood of using a particular service (such as a public hospital) or particular ‘events’ occurring (such as death, incidence of disease or incarceration). Age standardisation adjusts for the effect of variations in age profiles when comparing service usage, or rates, of particular events across different populations.

#### Calculating age standardised rates

Age standardisation adjusts each of the comparison/study populations (for example, Indigenous and non-Indigenous) against a standard population (box A.5). The standard population generally used is the final 30 June ERP for the most recent year ending in ‘1’ (for example, 2001 and 2011) (AIHW 2012). The result is a standardised estimate for each of the comparison/study populations.

The Review generally reports age-standardised rates that have been calculated using either one of two methods, as appropriate. The direct method is generally used for comparisons between study groups. The indirect method is recommended when the age-specific rates for the population being studied are not known (or are unreliable), but the total number of events is known (AIHW 2012).

The *direct* *method* has three steps:

Step 1: Calculate the age-specific rate for each age group for the study/comparison group.

Step 2: Calculate the expected number of ‘events’ in each age group by multiplying the age-specific rates by the corresponding standard population.

Step 3: Sum the expected number of cases in each age group and divide by the total of the standard population (box A.2, equation A.15).

The *indirect method* has four steps:

Step 1: Calculate the age-specific rates for each age group in the standard population.

Step 2: Apply the age-specific rates resulting from step 1 to the number in each age group of the study population and sum to derive the total ‘expected’ number of cases for the study population.

Step 3: Divide the observed number of events in the study population by the ‘expected’ number of cases for the study population derived in step 2.

Step 4: Multiply the result of step 3 by the crude rate in the standard population (box A.2, equation A.16).

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| Box A.2 Technical concepts and formulas — direct and indirect age standardisation |
| The formula for deriving the age standardised rate using the direct method is:  (equation A.15)  The formula for deriving the age standardised rate using the indirect method is:  (equation A.16)  The formula for deriving the age standardised ratio using the indirect method is:  (equation A.17)  Where:  is the age-standardised rate for the population being studied  is the standardised ratio for the population being studied  is the age-group specific rate for age group ***i*** in the population being studied  is the population of age group ***i*** in the standard population  is the observed number of events in the population being studied  is the expected number of events in the population being studied  is the age-group specific rate for age group ***i*** in the standard population  is the population for age group ***i*** in the population being studied  is the crude rate in the standard population. |
| *Source*: AIHW (2012). |
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Tables AA.52 and AA.53 in the attachment contain examples of the application of direct and indirect age standardisation, respectively. Standardised rates are generally multiplied by 1000 or 100 000 to avoid small decimal fractions. They are then reported as age standardised rates per 1000 or 100 000 population (AIHW 2012).

Figure A.6 compares crude imprisonment rates and imprisonment rates standardised against the age profile of the total Australian prisoner population for Indigenous and non-Indigenous Australians.

Figure A.6 Indigenous and non-Indigenous crude and age standardised imprisonment rates, 2007-08a, b

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| **Indigenous**  Figure A.6 Indigenous and non-Indigenous crude and age standardised imprisonment rates, 2007-08 - Indigenous  More details can be found within the text surrounding this image.  **Non-Indigenous**  Figure A.6 Indigenous and non-Indigenous crude and age standardised imprisonment rates, 2007-0 -  non indigenous.  More details can be found within the text surrounding this image. |

a For detailed notes relating to these figures, please see the *Report on Government Services 2009*,   
table 8A.4. **b** Rates are based on the indirect standardisation method, applying age-group imprisonment rates derived from Prison Census data.

*Source*: ABS (unpublished) *Australian Demographic Statistics, December 2007*, Cat. no. 3101.0; ABS (unpublished) *Experimental Projections Aboriginal and Torres Strait Islander Population*, Cat. no. 3231.0; ABS (unpublished) *Prisoners in Australia*, Cat. no. 4517.0; State and Territory governments (unpublished); SCRGSP (2009) *Report on Government Services 2009*, table 8A.4; table AA.53; 2013 Report, figure A.17, p. A.35.

#### Calculating age standardised ratios

A variation of the *indirect method* is used to calculate age standardised ratios   
(box A.5). These ratios express the overall experience of a study population in terms of a standard population, where the standard population is the population to which the study population is being compared.

*Application of age standardised ratios*

Standardised Mortality Ratios (SMRs) have been used to compare death rates between the Indigenous and non-Indigenous populations (table A.1). The SMR is the ratio between the observed number of deaths in the Indigenous population and the expected number of deaths that would have occurred if the Indigenous population experienced the same age-specific death rates as the non-Indigenous population. If the SMR is greater than 1.0, there were more deaths than expected; if the ratio is less than 1.0, there were fewer deaths than expected (ABS and   
AIHW 2008).

*New developments in age standardisation techniques*

The ABS and the AIHW have recently worked on improving age-standardisation techniques.

*Principles on the use of direct age-standardisation in administrative data collections: for measuring the gap between Indigenous and non-Indigenous Australians* (AIHW 2011) recommends that the direct method of age‑standardisation be used for purposes of comparing health and welfare outcome measures (for example, mortality rates, life expectancy, hospital separation rates and disease incidence rates) of the Indigenous population and non-Indigenous population. The principles provide consistency and guidance on when and how to use the direct age-standardisation method and under what circumstances it should not be used.

Table A.1 Indigenous deaths, main causes and standardised mortality ratios, 2001–2005a, b

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Male | | |  | Female | | |
|  | Number Observed | Number Expected | SMR |  | Number Observed | Number Expected | SMR |
| Diseases of the circulatory system | 1 150 | 360 | 3.2 |  | 856 | 320 | 2.7 |
| External causes | 851 | 292 | 2.9 |  | 369 | 105 | 3.5 |
| Neoplasms | 592 | 406 | 1.5 |  | 547 | 351 | 1.6 |
| Endocrine, nutritional and metabolic diseases | 315 | 42 | 7.5 |  | 367 | 36 | 10.1 |
| Diabetes | 281 | 26 | 10.8 |  | 319 | 22 | 14.5 |
| Diseases of the respiratory system | 378 | 88 | 4.3 |  | 281 | 77 | 3.6 |
| Diseases of the digestive system | 251 | 43 | 5.8 |  | 182 | 36 | 5.1 |
| Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified | 169 | 28 | 6.0 |  | 85 | 19 | 4.6 |
| Certain conditions originating in the perinatal period | 126 | 44 | 2.9 |  | 82 | 36 | 2.3 |
| Diseases of the genitourinary system | 79 | 16 | 4.8 |  | 119 | 20 | 6.0 |
| Diseases of the nervous system | 122 | 42 | 2.9 |  | 69 | 44 | 1.6 |
| Certain infectious and parasitic diseases | 102 | 20 | 5.1 |  | 72 | 14 | 5.0 |
| Mental and behavioural disorders | 101 | 17 | 5.8 |  | 72 | 23 | 3.1 |
| **All causes** | **4329** | **1438** | **3.0** |  | **3215** | **1123** | **2.9** |

SMR = Standardised Mortality Ratio. a Data for Queensland, WA, SA and NT combined. Deaths are based on year of registration of death. Disease groupings are based on ICD-10 chapter. b Standardised mortality ratio is the observed Indigenous deaths divided by expected Indigenous deaths, based on the age, sex and   
cause-specific rates for non-Indigenous Australians.

*Source*: ABS and AIHW (2008) *Health and Welfare of Australia’s Aboriginal and Torres Strait Islander Peoples, 2008*, Cat. no. 4704.0, Canberra; 2013 Report, table A.4, p. A.37.

### List of attachment tables

Attachment tables for data within this appendix are contained in the attachment to the Compendium. These tables are identified in references throughout this appendix by a ‘AA’ prefix (for example, table AA.1 is table 1 in the appendix attachment). Attachment tables are on the Review website (www.pc.gov.au/gsp).

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| **Population** |  |
| **Table AA.6** | People by country of birth, 2001 |
| **Table AA.7** | People by country of birth, 2006 |
| **Table AA.8** | People by country of birth, 2011 |
| **Table AA.9** | People by language spoken at home, 2001 ('000) |
| **Table AA.10** | People by language spoken at home, 2006 ('000) |
| **Table AA.11** | People by language spoken at home, 2011 ('000) |
| **Table AA.13** | Experimental estimated resident Australian Indigenous population, by age and sex, 30 June 2001 |
| **Table AA.14** | Experimental estimated resident Australian Indigenous population, by age and sex, 30 June 2006 |
| **Table AA.15** | Preliminary estimated resident Australian Indigenous population, by age and sex, 30 June 2011 |
| **Table AA.16** | Experimental projections of the Indigenous population, 2006 to 2021 (number) |
| **Table AA.17** | Language spoken at home by Indigenous Australians and proficiency in spoken English, by sex, 2001 (number) |
| **Table AA.18** | Language spoken at home by Indigenous Australians and proficiency in spoken English, by sex, 2006 (number) |
| **Table AA.19** | Language spoken at home by Indigenous Australians and proficiency in spoken English, by sex, 2011 (number) |
| **Family and household** | |
| **Table AA.23** | Families and people in families in occupied private dwellings by Indigenous status and family/household composition, 2001 |
| **Table AA.24** | Families and people in families in occupied private dwellings by Indigenous status and family/household composition, 2006 |
| **Table AA.25** | Families and people in families in occupied private dwellings by Indigenous status and family/household composition, 2011 |
| **Income and employment** | |
| **Table AA.34** | People aged 15 years or over by weekly individual income and Indigenous status, 2001 |
| **Table AA.35** | People aged 15 years or over by weekly individual income and Indigenous status, 2006 |
| **Table AA.36** | People aged 15 years or over by weekly individual income and Indigenous status, 2011 |
| **Table AA.41** | Highest level of schooling completed by people aged 15 years or over, by Indigenous status, 2001 ('000) |
| **Table AA.42** | Highest level of schooling completed by people aged 15 years or over, by Indigenous status (excluding people still attending secondary school), 2006 ('000) |
| **Table AA.43** | Highest level of schooling completed by people aged 15 years or over, by Indigenous status (excluding people still attending secondary school), 2011 ('000) |
| **Table AA.44** | Type of educational institution attending by Indigenous status, 2001 ('000) |
| **Table AA.45** | Type of educational institution attending by Indigenous status, 2006 ('000) |
| **Table AA.46** | Type of educational institution attending by Indigenous status, 2011 ('000) |
| **General economic indicators** | |
| **Table AA.50** | Gross State Product (2010-11 dollars) |
| **Table AA.51** | Gross Domestic Product price deflator (index) |
| **Statistical concepts** | |
| **Table AA.52** | Age standardisation of data using the direct method |
| **Table AA.53** | Age standardisation of data using the indirect method |

### References

ABS and AIHW (Australian Institute of Health and Welfare) 2008, *Health and Welfare of Australia’s Aboriginal and Torres Strait Islander Peoples*, Cat. no. 4704.0, Canberra.

AIHW 2011, *Principles on the use of direct age-standardisation in administrative data collections: for measuring the gap between Indigenous and non-Indigenous Australians,* Cat. no. CSI 12, Canberra.

—— 2012, *Age-standardised rate*, METeOR, meteor.aihw.gov.au/  
content/index.phtml/itemId/327276 (accessed 11 September 2012).