Statistical concepts

Adjusting financial data to real dollars

Time series financial data are adjusted to real dollars using the general government final consumption expenditure (GGFCE) chain price deflator so that comparisons over time are not affected by inflation (box 1).

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| Box 1 GGFCE deflator formulas |
| The GGFCE deflator is calculated from the ABS General government final consumption expenditure chain price indexes (ABS 2021) using the June estimates as follows:The formula used to re‑base GGFCE deflators is:*B**O**N**t**t*100Where: is the re-based GGFCE deflator in financial year *t;*  is the chain price index in June of financial year *t;* Formula   More details can be found within the text surrounding this image. is the chain price index in June of the financial year that will be the new base.*t**N**t**O*The formula to convert nominal dollars to real dollars is: 100*t**t**t**N**D**R*Where, for financial year *t*:Formula   More details can be found within the text surrounding this image. is real dollars; Formula   More details can be found within the text surrounding this image. is nominal dollars; Formula   More details can be found within the text surrounding this image. is the GGFCE deflator |
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Not all financial data in the Report are deflated using the GGFCE deflator. The exceptions include some health sections, the Emergency services for fire and other events section and the Vocational education and training section, which use service specific deflators to calculate real dollars.

The calculations to achieve real dollars are in two steps:

Step 1. Re-basing the GGFCE deflator (table 1).

The ABS publishes the GGFCE deflator with the base year lagged two years (for example, for June 2021 the available deflator has a base year of June 2019 = 100). This Report requires a base year of 2019-20 and 2020-21. Table 1 shows how the GGFCE deflator is re‑based for use in this Report. Five GGFCE deflator series are published, from 2016‑17 = 100 to 2020‑21 = 100 (table 2A.26).

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| Table 1 Re‑basing the GGFCE deflatora |
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| *Year* | *ABS chain price index* | *Calculation* | *Financial year* | *Re‑based GGFCE deflator* |
| *(June 2019 = 100)* | *(June 2021 = 100)* |
| June 2017 | 96.2 | 96.2/103.3\*100 | 2016-17 | 93.2 |
| June 2018 | 97.7 | 97.7/103.3\*100 | 2017-18 | 94.7 |
| June 2019 | 100.0 | 100.0/103.3\*100 | 2018-19 | 96.9 |
| June 2020 | 101.7 | 101.7/103.3\*100 | 2019-20 | 98.5 |
| June 2021 | 103.3 | 103.3/103.3\*100 | 2020-21 | 100.0 |

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| a Based on the chain price index values from ABS (2021).  |
| Source: ABS (2021), 'Table 36. Expenditure on Gross Domestic Product (GDP), Chain volume measures and Current prices, Annual' [time series spreadsheet], *Australian National Accounts: National Income, Expenditure and Product, June 2021,* https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-national-income-expenditure-and-product/jun-2021, accessed 7 September 2021; table 2A.26. |
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Step 2. Transforming nominal dollars into real dollars (table 2).

Nominal dollars are transformed into real dollars by dividing the nominal dollars by the GGFCE deflator for the applicable financial year and multiplying by 100. The deflator used may vary according to the most current year for which the particular financial data are available. For example, if the most current year for the data is 2018‑19 then the data are deflated using the deflator series for 2018‑19 = 100. If the most current year is 2019‑20 then the data are deflated using the deflator series for 2019‑20 = 100. Table 2 shows how the GGFCE deflator for 2020‑21 = 100 is applied.

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| Table 2 Applying the GGFCE deflator to derive real dollarsa |
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| Financial year | Nominal expenditure | GGFCE deflator (2020‑21= 100) | Calculation | Real expenditure |
| 2016-17 | 6 300 | 93.2 | (6 300/93.2)\*100 | 6 760 |
| 2017-18 | 6 350 | 94.7 | (6 350/94.7)\*100 | 6 705 |
| 2018-19 | 6 485 | 96.9 | (6 485/96.9)\*100 | 6 692 |
| 2019-20 | 7 020 | 98.5 | (7 020/98.5)\*100 | 7 127 |
| 2020-21 | 7 200 | 100.0 | (7 200/100.0)\*100 | 7 200 |

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| a Based on the chain price index values from ABS (2021).*Source*: Table 1. |
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## Reliability of estimates

Data for some indicators in this Report are based on samples, either from surveys or from a selection of observations from, for example, administrative data sets. The potential for sampling error — that is, the error that occurs by chance because the data are obtained from a sample and not the entire population — means that the reported estimates might not accurately reflect the true value.

This Report indicates the reliability of estimates based on samples generally by reporting either relative standard errors (RSEs) or confidence intervals (CIs). RSEs and CIs are calculated based on the standard error (SE). The larger the SE, RSE or CI, the less reliable the estimate is as an indicator for the whole population (ABS 2015).

### Standard error

The SE measures the sampling error of an estimate (box 2). (There can also be non‑sampling error, or systematic biases, in data.) There are several types of SE. A commonly used type of SE in this Report is the SE of the mean (average), which measures how much the estimated mean value might differ from the true population mean value.

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| Box 2 Standard error |
| The SE of a method of measurement or estimation is the estimated standard deviation of the error in that method. Specifically, it estimates the standard deviation of the difference between the measured or estimated values and the true values. Standard deviation is a measure of how spread out the data are, that is, a measure of variability.The SE of the mean, an unbiased estimate of expected error in the sample estimate of a population mean, is the sample estimate of the population standard deviation (sample standard deviation) divided by the square root of the sample size (assuming statistical independence of the values in the sample):Formula   More details can be found within the text surrounding this image. Where:Formula   More details can be found within the text surrounding this image. is the SE of the sample estimate of a population mean, Formula   More details can be found within the text surrounding this image. is the sample’s standard deviation (the sample-based estimate of the standard deviation of the population), and Formula   More details can be found within the text surrounding this image. is the size (number of items) of the sample.Decreasing the uncertainty of a mean value estimate by a factor of two requires the sample size to increase fourfold. Decreasing SE by a factor of ten requires the sample size to increase hundredfold. |
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### Relative standard error

The RSE is used to indicate the reliability of an estimate (box 3). The RSE shows the size of the error relative to the estimate, and is derived by dividing the SE of the estimate by the estimate. As with the SE, the higher the RSE, the less confidence there is that the sample estimate is close to the true value of the population mean. A rule of thumb adopted in this Report is that estimates with an RSE of less than 25 per cent are considered reliable, estimates with an RSE between 25 and 50 per cent are to be used with caution and estimates with an RSE greater than 50 per cent are considered too unreliable for general use.

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| Box 3 Relative standard error |
| The SE can be expressed as a proportion of the estimate — known as the RSE. The formula for the RSE of an estimate is: *x**x**SE**x**RSE*)()(Where:Formula   More details can be found within the text surrounding this image. is the estimate and Formula   More details can be found within the text surrounding this image. is the SE of the estimate.RSEs are generally multiplied by 100 and expressed as a percentage.Proportions and percentages formed from the ratio of two estimates are also subject to sampling error. The size of the error depends on the accuracy of both the numerator and the denominator.For proportions where the numerator is a subset of the denominator, for example the ratio of people who completed a certification over the people who attended the training to get the certification, then an approximation of the RSE can be calculated using the following formula:$$RSE\left(\frac{x}{y}\right)= \sqrt{[RSE(x)]^{2}-[RSE(y)]^{2}}$$Where: is the numerator, and Formula   More details can be found within the text surrounding this image. is the denominator, of the estimated proportion.For proportions where the denominator and numerator are independent estimates, for example a ratio of rates relating to two separate populations such as Aboriginal and Torres Strait Islander and non-Indigenous, and when the RSEs on the denominator and numerator are small, then an approximation of the RSE can be calculated using the following formula:$$RSE\left(\frac{x}{y}\right)= \sqrt{[RSE(x)]^{2}+[RSE(y)]^{2}}$$Note that the formulas shown above for the approximation of the RSE of a proportion are considered unsuitable when the RSE of the numerator is very close to, or below, the RSE of the denominator. In this case, it is recommended to use the following formula to calculate the RSE of the proportion:$$RSE\left(\frac{x}{y}\right)= \sqrt{[RSE(x)]^{2}+\left(1-\frac{2x}{y}\right)\*[RSE(y)]^{2}}$$ |
| *Source*: ABS (2019). |
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### Confidence intervals

Confidence intervals are used to indicate the reliability of an estimate. A CI is a specified interval, with the sample statistic at the centre, within which the corresponding population value can be said to lie with a given level of confidence (ABS 2015). Increasing the desired confidence level will widen the CIs (figure 1). CIs are useful because a range, rather than a single estimate, is more likely to encompass the real figure for the population value being estimated.

Confidence intervals are calculated from the population estimate and its associated SE. The most commonly used CI is calculated for 95 per cent levels of probability. For example, if the estimate from a survey was that 628 300 people report having their needs fully met by a government service, and the associated SE of the estimate was 10 600 people, then the 95 per cent CI would be calculated by:

* lower confidence limit = 628 300 – (1.96 x 10 600) = 628 300 – 20 776 = 607 524
* upper confidence limit = 628 300 + (1.96 x 10 600) = 628 300 + 20 776 = 649 076.

This indicates that we can be 95 per cent sure the true number of people who perceive that their needs are met by a government service is between 607 524 and 649 076.

The smaller the SE of the estimate, the narrower the CIs and the closer the estimate can be expected to be to the true value.

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| Figure 1 Normal distribution with 95 per cent confidence intervals |
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Confidence intervals also test for statistical differences between sample results (box 4).

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| Box 4 Using confidence intervals to test for statistical significance |
| The CIs — the value ranges within which estimates are likely to fall — can be used to test whether the results reported for two estimated proportions are statistically different. If the CIs for the results do not overlap, then there can be confidence that the estimated proportions differ from each other. To test whether the 95 per cent CIs of two estimates overlap, a range is derived using the following formulas.Forumla  More details can be found within the text surrounding this image. andForumla  More details can be found within the text surrounding this image. If none of the values in this range is zero, then the difference between the two estimated proportions is statistically significant. |
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For example, consider survey data that estimated that the proportion of people who perceived that their needs were met by government services was 50 per cent in jurisdiction A, with a 95 per cent CI of ± 5 per cent, and 25 per cent of people in jurisdiction B, with a 95 per cent CI of ± 10 per cent. These results imply that we can be 95 per cent sure the true result for jurisdiction A lies between 55 and 45 per cent, and the true result for jurisdiction B lies between 15 and 35 per cent. As these two ranges do not overlap, it can be said that the results for jurisdiction A and jurisdiction B are statistically significantly different.

### Variability bands

Rates derived from administrative data counts are not subject to sampling error but might be subject to natural random variation, especially for small counts. For mortality data, variability bands are used to account for this variation (box 5).

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| Box 5 Variability bands |
| The variability bands to be calculated using the standard method for estimating 95 per cent confidence intervals are:*Crude rate (CR)*Forumla  More details can be found within the text surrounding this image. Where:*Forumla  More details can be found within the text surrounding this image.* is the numerator of the estimated proportion*Age‑standardised rate (ASR)*Forumla  More details can be found within the text surrounding this image. Where:*Forumla  More details can be found within the text surrounding this image.* is the proportion of the standard population in age group Forumla  More details can be found within the text surrounding this image.*Forumla  More details can be found within the text surrounding this image.* is the number of deaths in age group Forumla  More details can be found within the text surrounding this image.*Forumla  More details can be found within the text surrounding this image.* is the number of people in the population in age group Forumla  More details can be found within the text surrounding this image..*Infant mortality rate (IMR)*Forumla  More details can be found within the text surrounding this image. Where:Forumla  More details can be found within the text surrounding this image. is the number of deaths in infants aged less than 1 year. |
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Variability bands accompanying mortality data should be used for the purpose of within jurisdiction analysis at a point in time and over time. They should not be used for comparing mortality rates at a single point in time or over time between jurisdictions as they do not take into account differences in under‑identification of Aboriginal and Torres Strait Islander people’s deaths between jurisdictions.

Typically in this standard method, the observed rate is assumed to have natural variability in the numerator count (for example, deaths) but not in the population denominator count. Variations in Aboriginal and Torres Strait Islander people’s death rates may arise from uncertainty in the recording of Indigenous status on the death registration forms (in particular, under‑identification of Aboriginal and Torres Strait Islander people’s deaths) and in the ABS 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 (figure 1). Random variation in the numerator count is assumed to be centred around the true value — that is, there is no systematic bias.

## Population measures

Data are frequently expressed relative to population in this Report. For example, expenditure per person, or proportion of people who utilise a service or who benefit from a service. This enables comparison of data across populations of different sizes using relative numbers — standardised by population size — as distinct from absolute numbers.

Estimated Resident Population (ERP) data are available quarterly — that is, at end March, June, September and December of each year. The mid‑point ERP is typically used for the calculation of population rates in this Report — for example, the 30 June ERP for calendar year data (table 2A.1) and the 31 December ERP for financial year data (table 2A.2).

This Report uses first preliminary ERP data wherever possible and replaces these with final rebased data when available. For the 2022 Report, this equates to:

* for June, ERP for 2011 is final based on the 2011 Census of Population and Housing; ERP for 2012 to 2016 are final based on the 2016 Census of Population and Housing; ERP for 2017 to 2020 are first preliminary based on the 2016 Census
* for December, ERP for 2011 to 2015 are final based on the 2016 Census of Population and Housing; ERP for 2016 to 2020 are first preliminary based on the 2016 Census.

## Average annual growth rate

This Report presents a growth rate to facilitate meaningful comparisons of changes over time. The method used is the average annual growth rate (AAGR) which is the uniform growth rate that would need to have applied each year for the value in the first year to grow to the value in the final year of the period of analysis (box 6).

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| Box 6 Average annual growth rate |
| The formula for calculating a compound average annual growth rate (AAGR) is:Forumla  More details can be found within the text surrounding this image. Where:Forumla  More details can be found within the text surrounding this image. is the value in the initial period, Forumla  More details can be found within the text surrounding this image. is the value in the last period andForumla  More details can be found within the text surrounding this image. is the number of periods (which will be one less than the total number of years). |
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## 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 Aboriginal and Torres Strait Islander people and non‑Indigenous people). 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, Aboriginal and Torres Strait Islander people and non‑Indigenous people) against a standard population (box 7). The latest standard population used is the final 30 June ERP for the 2001 (AIHW 2015).[[1]](#footnote-2) The result is a standardised estimate for each of the comparison/study populations.

The Report generally publishes 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, and is recommended by the AIHW (2011) for the purposes of comparing health and welfare outcome measures (for example, mortality rates, life expectancy, hospital separation rates and disease incidence rates) of Aboriginal and Torres Strait Islander people and non-Indigenous people.
* 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 2015).

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.

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.

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| Box 7 Direct and indirect age standardisation |
| The formula for deriving the age standardised rate using the *direct method* is:Forumla  More details can be found within the text surrounding this image. The formula for deriving the age standardised rate using the *indirect method* is:Forumla  More details can be found within the text surrounding this image. The formula for deriving the age standardised ratio using the *indirect method* is:Forumla  More details can be found within the text surrounding this image. Where:Forumla  More details can be found within the text surrounding this image. is the age‑standardised rate for the population being studiedForumla  More details can be found within the text surrounding this image. is the standardised ratio for the population being studiedForumla  More details can be found within the text surrounding this image. is the age‑group specific rate for age group ***i*** in the population being studiedForumla  More details can be found within the text surrounding this image. is the population of age group ***i*** in the standard populationForumla  More details can be found within the text surrounding this image. is the observed number of events in the population being studiedForumla  More details can be found within the text surrounding this image. is the expected number of events in the population being studiedForumla  More details can be found within the text surrounding this image. is the age‑group specific rate for age group ***i*** in the standard populationForumla  More details can be found within the text surrounding this image. is the population for age group ***i*** in the population being studiedForumla  More details can be found within the text surrounding this image. is the crude rate in the standard population. |
| *Source*: AIHW (2015). |
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Tables 3–4 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 2015).

| Table 3 Age standardisation of data using the direct method |
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| ***Step 1*** |
| *Age groups* | *Non-Indigenous people* |  | *Aboriginal and Torres Strait Islander people* |
|  | *Population* | *People with severe/profound limitations* | *Age-specific severe/profound limitations* |  | *Population* | *People with severe/profound limitations* | *Age-specific severe/profound limitations* |
|  | *C1* | *C2* | *C3 = C2/C1\*100* |  | *C4* | *C5* | *C6=C5/C4\*100* |
| 18 to 24 | 1 869 200 |  34 200 | 1.8 |  |  54 400 |  2 800 |  5.1 |
| 25 to 29 | 1 389 700 |  24 700 | 1.8 |  |  36 300 |  1 600 |  4.4 |
| 30 to 34 | 1 458 500 |  37 100 | 2.5 |  |  34 800 |  2 800 |  8.0 |
| 35 to 39 | 1 432 000 |  43 900 | 3.1 |  |  31 200 |  1 600 |  5.1 |
| 40 to 44 | 1 475 000 |  70 200 | 4.8 |  |  26 600 |  2 800 |  10.5 |
| 45 to 49 | 1 366 300 |  43 800 | 3.2 |  |  20 600 |  2 000 |  9.7 |
| 50 to 54 | 1 263 900 |  47 900 | 3.8 |  |  17 700 |  3 000 |  16.9 |
| 55 to 59 | 1 060 700 |  63 500 | 6.0 |  |  12 400 |  1 400 |  11.3 |
| 60 to 64 |  816 400 |  49 700 | 6.1 |  |  7 000 |  1 100 |  15.7 |
| 65 or over | 2 222 200 |  283 400 | 12.9 |  |  12 900 |  3 200 |  24.8 |
| **Total** | **14 353 900** |  **698 400** | **4.9** |  |  **253 900** |  **22 300** |  **8.8** |

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| Table 3 (continued) |
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| ***Step 2*** |  | ***Step 3*** |
| *Age groups* | *Standard population* | *Non-Indigenous people expected number of ‘events’* | *Aboriginal and Torres Strait Islander people expected number of ‘events’* |  | *Non-Indigenous people age standardised rate* | *Aboriginal and Torres Strait Islander people age standardised rate* | *Rate ratio Aboriginal and Torres Strait Islander people/non-Indigenous people* |
|  | C7 | C8=C7\*C3/100 | C9=C7\*C6/100 |  | C10=∑C8/∑C7\*100 | C11=∑C9/∑C7\*100 | *C12 = C11/C10* |
| 18 to 24 | 1 844 162 |  33 742 |  94 920 |  |  |  |  |
| 25 to 29 | 1 407 081 |  25 009 |  62 020 |  |  |  |  |
| 30 to 34 | 1 466 615 |  37 306 |  118 004 |  |  |  |  |
| 35 to 39 | 1 492 204 |  45 746 |  76 523 |  |  |  |  |
| 40 to 44 | 1 479 257 |  70 403 |  155 711 |  |  |  |  |
| 45 to 49 | 1 358 594 |  43 553 |  131 902 |  |  |  |  |
| 50 to 54 | 1 300 777 |  49 298 |  220 471 |  |  |  |  |
| 55 to 59 | 1 008 799 |  60 393 |  113 897 |  |  |  |  |
| 60 to 64 |  822 024 |  50 042 |  129 175 |  |  |  |  |
| 65 or over | 2 435 534 |  310 607 |  604 163 |  |  |  |  |
| **Total** | **14 615 047** |  **726 098** | **1 706 787** |  |  **5.0** |  **11.7** |  **2.4** |

 |
| *Source(s)*: AIHW (Australian Institute of Health and Welfare) 2006, ‘Potential Population’ — Updating the Indigenous Factor in Disability Services Performance Indicator Denominators, Welfare Working Paper Series Number 50, Cat. no. DIS 45, Canberra; ABS (2008) Population by Age and Sex, Australian States and Territories, June 2007, Cat. no. 3201.0, Canberra. |
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| Table 4 Age standardisation of data using the indirect method (a), (b) |
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| Variable | NSW (c) | Vic | Qld | WA | SA | Tas | ACT (c) | NT | Aust |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| C — Observed number of imprisonments |
|  Aboriginal and Torres Strait  Islander people |  2 008 |  236 |  1 451 |  1 588 |  412 |  70 |  21 |  720 |  6 505 |
|  Non-Indigenous people |  7 267 |  3 930 |  4 040 |  2 215 |  1 443 |  469 |  160 |  155 |  19 679 |
| R — Standard population imprisonment rate (per 100 000 prisoners) |  |  |  |  |
|  |  153.2 |  153.2 |  150.7 |  153.2 |  153.2 |  153.2 |  153.2 |  153.2 |  153.2 |
| p*i* — Study populations  |  |  |  |  |  |  |  |
| Aboriginal and Torres Strait Islander people |  |  |  |  |  |  |  |
|  17/18–20 years |  6 541 |  1 460 |  9 773 |  3 246 |  1 241 |  914 |  196 |  2 581 |  25 952 |
|  20–24 years |  14 176 |  3 183 |  13 521 |  7 446 |  2 941 |  1 931 |  452 |  6 193 |  49 843 |
|  25–29 years |  10 653 |  2 519 |  10 840 |  5 956 |  2 252 |  1 407 |  358 |  5 525 |  39 510 |
|  30–34 years |  9 371 |  2 191 |  10 036 |  5 050 |  2 066 |  1 065 |  350 |  4 948 |  35 077 |
|  35–39 years |  10 188 |  2 335 |  10 074 |  5 172 |  2 005 |  1 145 |  340 |  4 771 |  36 030 |
|  40–44 years |  8 599 |  1 955 |  8 189 |  4 373 |  1 709 |  1 055 |  293 |  3 750 |  29 923 |
|  45–54 years |  13 724 |  2 914 |  12 196 |  6 665 |  2 634 |  1 852 |  404 |  5 366 |  45 755 |
|  55+ years |  12 187 |  2 536 |  10 343 |  5 733 |  2 255 |  1 480 |  251 |  4 765 |  39 550 |
|  **Total** |  **85 439** |  **19 093** |  **84 972** |  **43 641** |  **17 103** |  **10 849** |  **2 644** |  **37 899** |  **301 640** |

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| Table 4 (continued) |
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| Variable | NSW (c) | Vic | Qld | WA | SA | Tas | ACT (c) | NT | Aust |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Non-Indigenous people |  |  |  |  |  |  |  |  |  |
|  17/18–20 years |  180 194 |  143 317 |  166 645 |  57 300 |  41 754 |  12 395 |  10 539 |  3 843 |  615 987 |
|  20–24 years |  463 309 |  374 430 |  287 625 |  146 914 |  107 652 |  29 445 |  29 191 |  11 655 | 1 450 221 |
|  25–29 years |  472 093 |  368 995 |  280 354 |  141 421 |  98 380 |  26 809 |  28 387 |  13 087 | 1 429 526 |
|  30–34 years |  476 046 |  367 820 |  280 322 |  141 251 |  97 734 |  27 610 |  25 614 |  13 245 | 1 429 642 |
|  35–39 years |  499 251 |  397 916 |  305 448 |  156 460 |  110 513 |  32 650 |  26 098 |  13 360 | 1 541 696 |
|  40–44 years |  480 492 |  376 440 |  294 009 |  153 356 |  111 738 |  32 838 |  24 159 |  12 563 | 1 485 595 |
|  45–54 years |  941 244 |  715 564 |  568 926 |  295 145 |  223 777 |  70 680 |  46 916 |  24 254 | 2 886 506 |
|  55+ years | 1 713 479 | 1 284 272 |  985 918 |  485 295 |  431 531 |  134 947 |  70 226 |  25 677 | 5 131 345 |
|  **Total** | **5 226 108** | **4 028 754** | **3 169 247** | **1 577 142** | **1 223 079** |  **367 374** |  **261 130** |  **117 684** | **15 970 518** |
| ***Step 1:– Calculate Ri*** |
| R*i* — Standard population age-specific imprisonment rates (30 June 2001) |  |  |  |  |
|  17–20 years |  |  |  |  |  |  |  |  |  124.6 |
|  18–20 years |  |  |  |  |  |  |  |  |  179.4 |
|  20–24 years |  |  |  |  |  |  |  |  |  359.4 |
|  25–29 years |  |  |  |  |  |  |  |  |  345.2 |
|  30–34 years |  |  |  |  |  |  |  |  |  271.8 |
|  35–39 years |  |  |  |  |  |  |  |  |  193.6 |
|  40–44 years |  |  |  |  |  |  |  |  |  131.6 |
|  45–54 years |  |  |  |  |  |  |  |  |  77.3 |
|  55+ years |  |  |  |  |  |  |  |  |  23.5 |

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| Table 4 (continued) |
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|

| Variable | NSW (c) | Vic | Qld | WA | SA | Tas | ACT (c) | NT | Aust |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Step 2: pi\*Ri*** |
| Aboriginal and Torres Strait Islander people |  |  |  |  |  |
|  17/18–20 years |  11.7 |  2.6 |  12.2 |  5.8 |  2.2 |  1.6 |  0.4 |  4.6 |  46.6 |
|  20–24 years |  51.0 |  11.4 |  48.6 |  26.8 |  10.6 |  6.9 |  1.6 |  22.3 |  179.2 |
|  25–29 years |  36.8 |  8.7 |  37.4 |  20.6 |  7.8 |  4.9 |  1.2 |  19.1 |  136.4 |
|  30–34 years |  25.5 |  6.0 |  27.3 |  13.7 |  5.6 |  2.9 |  1.0 |  13.4 |  95.3 |
|  35–39 years |  19.7 |  4.5 |  19.5 |  10.0 |  3.9 |  2.2 |  0.7 |  9.2 |  69.8 |
|  40–44 years |  11.3 |  2.6 |  10.8 |  5.8 |  2.2 |  1.4 |  0.4 |  4.9 |  39.4 |
|  45–54 years |  10.6 |  2.3 |  9.4 |  5.2 |  2.0 |  1.4 |  0.3 |  4.1 |  35.4 |
|  55+ years |  2.9 |  0.6 |  2.4 |  1.3 |  0.5 |  0.3 |  0.1 |  1.1 |  9.3 |
|  **Total** |  **169** |  **39** |  **168** |  **89** |  **35** |  **22** |  **6** |  **79** |  **611** |
| Non-Indigenous people |  |  |  |  |  |  |  |  |  |
|  17/18–20 years |  323.3 |  257.1 |  207.7 |  102.8 |  74.9 |  22.2 |  18.9 |  6.9 |  |
|  20–24 years |  1 665.3 |  1 345.9 |  1 033.9 |  528.1 |  387.0 |  105.8 |  104.9 |  41.9 |  5 212.8 |
|  25–29 years |  1 629.4 |  1 273.6 |  967.6 |  488.1 |  339.6 |  92.5 |  98.0 |  45.2 |  4 934.0 |
|  30–34 years |  1 294.0 |  999.8 |  762.0 |  383.9 |  265.7 |  75.0 |  69.6 |  36.0 |  3 886.0 |
|  35–39 years |  966.7 |  770.5 |  591.5 |  303.0 |  214.0 |  63.2 |  50.5 |  25.9 |  2 985.3 |
|  40–44 years |  632.5 |  495.5 |  387.0 |  201.9 |  147.1 |  43.2 |  31.8 |  16.5 |  1 955.6 |
|  45–54 years |  727.8 |  553.3 |  439.9 |  228.2 |  173.0 |  54.7 |  36.3 |  18.8 |  2 232.0 |
|  55+ years |  402.5 |  301.6 |  231.6 |  114.0 |  101.4 |  31.7 |  16.5 |  6.0 |  1 205.2 |
|  **Total** |  **7 642** |  **5 997** |  **4 621** |  **2 350** |  **1 703** |  **488** |  **427** |  **197** |  **23 516** |

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| Table 4 (continued) |
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| Variable | NSW (c) | Vic | Qld | WA | SA | Tas | ACT (c) | NT | Aust |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Step 3: C/*∑ *pi\*Ri*** |
| Aboriginal and Torres Strait Islander people |  11.9 |  6.1 |  8.7 |  17.8 |  11.8 |  3.2 |  3.7 |  9.1 |  10.6 |
| Non-Indigenous people |  1.0 |  0.7 |  0.9 |  0.9 |  0.8 |  1.0 |  0.4 |  0.8 | 0.8 |
| ***Step 4: Result step 3\*R*** |
| **Age standardised rate** |  |  |  |  |  |  |  |  |  |
| **Aboriginal and Torres Strait Islander people** |  **1 815.6** |  **935.8** |  **1 304.2** |  **2 728.4** |  **1 809.3** |  **496.8** |  **563.2** |  **1 398.1** |  **1 630.4** |
| **Non-Indigenous people** |  **145.7** |  **100.4** |  **131.8** |  **144.4** |  **129.8** |  **147.0** |  **57.3** |  **120.5** |  **128.2** |
| **Rate ratio (d)** |  **12.5** |  **9.3** |  **9.9** |  **18.9** |  **13.9** |  **3.4** |  **9.8** |  **11.6** |  **12.7** |

 |
| a Rates are based on the indirect standardisation method, applying age-group imprisonment rates derived from Prison Census data. b Rates are based on the daily average prisoner, periodic detainee or offender populations supplied by states and territories, calculated against adult population figures at December 2007 for people aged 17 years or over for Queensland and for people aged 18 or over for all other jurisdictions, reflecting the age at which people are remanded or sentenced to adult custody. (Source: ABS National Centre for Crime and Justice Statistics). c NSW figures exclude ACT prisoners held in NSW prisons. ACT data are presented as total prisoners. d The rate ratio is calculated by dividing the Aboriginal and Torres Strait Islander people age standardised rate by the non-Indigenous people age standardised rate. |
| *Source(s)*: 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 (Steering Committee for the Review of Government Service Provision) 2009, Report on Government Services 2009, table 8A.6. |
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### Calculating age standardised ratios

A variation of the *indirect method* is used to calculate age standardised ratios (box 7). 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.

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1. See page 2.27 in SCRGSP (2015) for the background on choice of year for the standard population and timeline for revision. [↑](#footnote-ref-2)