1 Background

The quality of Indigenous status information in hospital admitted patient data has been a matter of longstanding concern for both the users of those data and the organisations responsible for collecting the data. In particular, concern has focused on the apparent under-identification of Indigenous patients, and on the representativeness of data that are identified as being for Indigenous people, with geographically-based variation both across and within jurisdictions. Various studies have suggested that the under-identification of Indigenous persons in hospital separations data stems from the lack of collecting or reporting of Indigenous status information using the agreed national standards.

In its *Strategic plan 2006–2008*, the NAGATSIHID identified the improvement of Indigenous identification in administrative data sets as a high priority. It was noted that variations in the quality of Indigenous identification among jurisdictions and across time affect the usefulness of the data, and may mask changes in the use of health services and/or the health status of Indigenous persons (AIHW 2006).

The quality of Indigenous information in Australian hospital separations data was most recently the subject of a multi-jurisdictional study in 1998 (AIHW: Gray 1999). Then, the 2005 AIHW report *Improving the quality of Indigenous identification in hospital separations data* (AIHW 2005a) drew together available evidence of the quality of Indigenous data and recommended that efforts be made to improve it.

The 2005 report recommended that the analysis of hospital separations data for Indigenous persons be restricted to the data for Queensland, South Australia, Western Australia, and the Northern Territory (public hospitals only). Therefore, national analyses of admitted patient data for Indigenous persons had not been available.

The report also included a recommendation that 'An audit of Indigenous identification using patient interviews or another robust methodology should be periodically conducted for public and private hospitals on a nationally coordinated basis, in order to assess data quality and generate comparable and up-to-date under-identification factors'.

In 2006, the AHMAC and the OATSIH approved funding for a further project to investigate the level of under-identification of Indigenous persons in admitted patient care data in Australian hospitals. It was considered necessary to assess whether, with efforts being made by jurisdictions to improve the quality of the data, the levels of Indigenous identification had improved since the previous assessments.

The Indigenous identification quality project was undertaken between 2006 and 2008 in selected public hospitals in all Australian states and territories.

For most states and territories, the level of under-identification was assessed through an audit in public hospitals by comparing the results of face-to-face interviews with patients to the information recorded in the administrative record (see *Chapter 2* for more information on the Indigenous identification audit).

In the Australian Capital Territory (ACT), Indigenous identification was assessed through a linkage project where records from ACT public hospital admissions data were linked with data from the ACT's Aboriginal health service (see *Chapter 2* for more information on the ACT Hospital Data Linkage project).

1.1 This report

This report presents the latest findings on the quality of Indigenous identification in hospital separations data in Australia. The structure is:

- This chapter describes the background to the Indigenous identification quality project. Previous projects that reported the under-identification of Indigenous persons in Australian hospital data are described and information on the quality of Indigenous status information reported to the National Hospital Morbidity Database (NHMD) from 2002–03 to 2006–07 is presented.
- Chapter 2 describes the Indigenous identification quality project in more detail and outlines the roles of the AIHW and the state and territory health authorities for this project.
- Chapter 3 describes the methods used, including for the calculation of the sample sizes and the criteria used to select participating hospitals and patients.
- Chapter 4 presents the results of the project and includes detail of the estimation process and Indigenous under-identification by state and territory, and by remoteness area.
- Chapter 5 provides updated recommendations for the reporting of national Indigenous hospitalisation statistics, including health expenditure reporting.
- Appendix 1 presents technical notes on the methodology and analysis.
- Appendix 2 contains documents used in the information and data collection package that was provided to hospitals taking part in the audit.

1.2 Previous projects

The following section includes detail on two previous projects: the 1998 pilot project which provided the framework for the method used in the Indigenous identification audit; and the 2005 project which led to recommendations restricting national reporting on Indigenous hospitalisation data.

The 1998 pilot project

The 1998 project *Assessing the quality of identification of Aboriginal and Torres Strait Islander people in hospital data* developed, piloted and evaluated a methodology to assess the completeness of the identification of Indigenous people in hospital separations data (AIHW: Gray 1999). This project was funded by the Australian Health Ministers' Advisory Council. The Aboriginal and Torres Strait Islander Health and Welfare Information Unit (ATSIHWIU), a joint program of the Australian Bureau of Statistics (ABS) and the AIHW, managed and coordinated the project.

Method

Under the pilot project methodology, face-to-face patient interviews were conducted in hospitals. The patient's Indigenous status information was obtained from interview, together with other demographic information including sex, date of birth, country of birth, and residential address. The interview information was then compared with the information held

in the hospital admissions record. This methodology was based on the assumption that information collected from the face-to-face interview was correct.

The project team sought to develop a methodology that would be effective in a range of settings. The sample of 12 participating hospitals was selected to cover five jurisdictions, including hospitals of varying sizes, with varying proportions of Indigenous residents in their catchment areas.

The selection of the patients for the sample was based on the principle that all patients who had been admitted and were in hospital on the interview days should be included, with the exception of patients in Intensive Care Units and patients not well enough to give their consent to the interview.

To ensure a representative sample of patients:

- the sample included same-day and overnight separations in similar proportions to that of the hospital overall
- all wards and parts of the hospital were covered in the sampling, except for areas where access was restricted for medical reasons.

The sample size of patients for each hospital was calculated by a formula which accounted for the following factors:

- the proportion of Indigenous persons estimated to have been correctly reported (in hospital records)
- the proportion of hospital separations reported for Indigenous Australians
- the required standard error for estimating the proportion of Indigenous people correctly recorded.

In addition to the sample size and sampling strategy, the ATSIHWIU also designed the interview information sheet, the training package for the interviewers, and the questionnaire used to conduct the hospital surveys.

Outcomes

Interviews were conducted in 11 hospitals. One small hospital with a low patient turnover was not able to participate. The project found that:

- The accuracy of recording patients' Indigenous status varied substantially from hospital to hospital. The proportion of patients identified as Indigenous at interview, who were also recorded as Indigenous in the hospital admission records, ranged from 55% to 100%.
- The accuracy of recording the Indigenous status of non-Indigenous patients also varied. The proportion of non-Indigenous patients at interview, who were correctly recorded as non-Indigenous in the hospital admission records, ranged from 94% to 100%.
- In general, the recording of Indigenous status for Indigenous patients showed a lower level of accuracy than other demographic items in hospital admission records. Other personal information (such as age, sex, and residential address) was also inaccurately and incompletely recorded in hospital admission records. However, the recording of these items showed a smaller variation from hospital to hospital, and was generally more accurate than the recording of Indigenous status for Indigenous patients. For example, the proportion of patients whose sex was correctly recorded ranged from 96% to 100%.

- The accuracy of recording of Indigenous status for Indigenous patients did not vary greatly according to their sex or age.
- The proportion of Indigenous people living in a hospital's catchment area appeared to have a large influence on the accuracy of hospital's recording of Indigenous status for Indigenous patients. This recording was found to be more accurate in hospitals with a high proportion of Indigenous people living in the catchment areas. However, the study also found that a hospital located in an area with a low proportion of Indigenous people living in the catchment area had an excellent level of Indigenous status recording.

The 2005 Indigenous identification project

In 2005, AHMAC provided funding for an Indigenous identification project to:

- describe what was known about the completeness of Indigenous identification in hospitals data and methods, to record it from a summary of work undertaken previously by the AIHW and others
- outline methods used by jurisdictions to improve identification, including examples of best practice and of those methods that were unsuccessful
- develop analysis guidelines to support the consistent and appropriate analysis of Indigenous status in hospital data. They could include adjustment or correction factors for under-reporting, recommendations for analysing *Not reported* responses, recommendations relating to the use of the sub-categories of Aboriginal, Torres Strait Islander and Aboriginal and Torres Strait Islander, and recommendations on the use of data for specific states and territories.

Method

The project involved:

- analysis of existing hospital data
- a review of previous studies that assessed the level of identification of Indigenous hospital data in all jurisdictions
- a survey of relevant personnel in the jurisdictions.

The survey covered topics such as data quality, collection processes in public and private hospitals, staff education and training, other data quality improvement activity and data analysis.

A technical advisory group was established to provide advice on analysis guidelines. The group comprised representatives from the AIHW, NAGATSIHID, ABS, and the health authorities of New South Wales, Queensland, Western Australia and South Australia.

Outcomes

Following this work, the AIHW published the report *Improving the quality of Indigenous identification in hospital separations data* (AIHW 2005a). The report found that, in studies based on patient interviews, the proportions of Indigenous patients found to have been correctly identified in hospital records were:

- 93% overall for the five Northern Territory public hospitals in 1997
- 85% overall for the 11 public hospitals in five jurisdictions in the 1998 pilot project

- 86% overall for 26 public hospitals in Western Australia in 2000
- 74% overall for two metropolitan public hospitals in Queensland in 2000.

In addition:

- a study of linked multiple patient episodes for Indigenous persons in New South Wales in 1997–98 found that Indigenous status had been incorrectly specified for 12% of episodes
- based on information from Indigenous hospital liaison officers, there was a net 22% undercount of separations for Indigenous persons in Victoria in 2001–02.

The 2005 report recommended that data only for Queensland, South Australia, Western Australia, and the Northern Territory (public hospitals only) should be included in national analyses of Indigenous admitted patient care. The recommendation was largely based on an agreed acceptable level of 80% Indigenous identification, with evidence for the level of identification based either on the studies noted above, or on estimates used in the AIHW's *Expenditures on health for Aboriginal and Torres Strait Islander peoples, 2001–02* (AIHW 2005b). This acceptable level was agreed for the purpose of allowing 'a reasonably precise quantification of hospital use for a majority of the Indigenous population' (AIHW 2005a).

The recommendation was endorsed in 2005 by the NAGATSIHID, the Australian Hospital Statistics Advisory Committee (AHSAC) and the Statistical Information Management Committee (SIMC).

1.3 Indications of Indigenous status data quality

The quality of Indigenous status data can be broadly assessed by examining the proportion of separations for which Indigenous status was not reported, and the Indigenous to non-Indigenous separation rate ratios. An assessment is presented below, on that basis, of the quality of Indigenous identification in hospital separations data reported to the NHMD between 2002–03 and 2006–07.

Indigenous status reporting, 2006–07

At 30 June 2006, Indigenous persons made up approximately 2.5% of the total estimated resident population of Australia (ABS estimated projections of the resident Indigenous population, low series (ABS 2008)).

Nationally in 2006–07, 3.4% of hospital separations (258,611) were for *Indigenous* persons (includes 'Aboriginal but not Torres Strait Islander', 'Torres Strait Islander but not Aboriginal' and 'Both Aboriginal and Torres Strait Islander') and 94.2% were for *Non-Indigenous* persons ('Neither Aboriginal nor Torres Strait Islander').

'Not reported' rates

The Indigenous status of the patient was *Not reported* for 2.4% of separations in 2006–07 (Table 1.1).

Both the proportion of separations for *Indigenous* persons, and the proportion for which the Indigenous status of the patient was *Not reported* varied by hospital sector. In 2006–07, 5.2% of public hospital separations were for *Indigenous* persons, and the Indigenous status of the patient was *Not reported* for 1.1% of separations. For private hospitals, 0.5% of separations

were for *Indigenous* persons and Indigenous status was *Not reported* for 4.4% of separations. The private sector thus accounted for 71.0% of all separations for which the Indigenous status of the patient was *Not reported* (Table 1.1).

Table 1.1: Hospital separations, by Indigenous status and hospital sector, states and territories, 2006–07

	NSW	VIC	Qld	WA	SA	Tas	ACT	NT	Australia
Public hospitals									
Indigenous	50,557	11,444	60,193	42,251	17,278	2,788	1,529	57,863	243,903
Non-Indigenous	1,394,539	1,296,086	710,634	408,645	362,120	91,205	73,200	27,914	4,364,343
Not reported	17,033	6,712	13,803	0	11,249	3,163	1,038	36	53,034
Total	*1,462,129*	*1,314,242*	*784,630*	*450,896*	*390,647*	*97,156*	*75,767*	*85,813*	*4,661,280*
Private hospitals									
Indigenous	1,138	480	3,855	8,294	457	n.p.	n.p.	n.p.	14,708
Non-Indigenous	797,112	755,411	654,547	280,869	225,520	n.p.	n.p.	n.p.	2,797,267
Not reported	10,126	5,526	83,612	0	3,347	n.p.	n.p.	n.p.	129,662
Total	*808,376*	*761,417*	*742,014*	*289,163*	*229,324*	*n.p.*	*n.p.*	*n.p.*	*2,941,637*
All hospitals									
Indigenous	51,695	11,924	64,048	50,545	17,735	n.p.	n.p.	n.p.	258,611
Non-Indigenous	2,161,651	2,051,497	1,365,181	689,514	587,640	n.p.	n.p.	n.p.	7,161,610
Not reported	27,159	12,238	97,415	0	14,596	n.p.	n.p.	n.p.	182,696
Total	**2,270,505**	**2,075,659**	**1,526,644**	**740,059**	**619,971**	**n.p.**	**n.p.**	**n.p.**	**7,602,917**

Notes

1. Separations for which the care type was reported as *Newborn* with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.

2. Identification of Indigenous patients was not considered to be complete and completeness varied among the jurisdictions. The *Not reported* Indigenous status was not permitted in records for public and private hospitals in Western Australia. Indigenous status was *Not reported* for all Northern Territory private hospital records.

Source: AIHW National Hospital Morbidity Database.

States and territories

There was variation in the level of non-reporting of Indigenous status among states and territories. For Western Australia, the reporting system did not allow for a *Not reported* Indigenous status and, therefore, records with an unknown Indigenous status are recorded as *Non-Indigenous*. For public hospitals, the non-reporting of Indigenous status ranged from less than 0.1% of separations in the Northern Territory to 3.3% in Tasmania. For private hospitals (excluding Tasmania, the Australian Capital Territory and the Northern Territory), non-reporting ranged from 0.7% in Victoria to 11.3% in Queensland (Table 1.1).

Remoteness areas

The non-reporting of Indigenous status also varied according to the remoteness of the hospital, both among and within jurisdictions. Non-reporting was greater for public hospitals in *Very remote* areas (1.9%) than for other areas (1.1% to 1.5%, Table 1.2). For private hospitals, non-reporting was greatest for hospitals in *Outer regional* areas (28.0%) and in *Major cities*, it ranged from 0.8% in Victoria to 12.3% in Queensland.

Table 1.2: Proportion of separations with Indigenous status *Not reported*, by remoteness area of hospital, states and territories, 2006–07

	Major cities	Inner regional	Outer regional	Remote	Very remote	Total
Public hospitals						
New South Wales	1.1	1.1	1.7	3.0	1.8	1.2
Victoria	0.6	0.3	0.3	0.0	. .	0.5
Queensland	1.6	1.7	1.7	4.6	6.2	1.8
Western Australia	0.0	0.0	0.0	0.0	0.0	0.0
South Australia	3.1	2.6	1.9	3.0	0.8	2.9
Tasmania	. .	3.0	4.2	6.7	5.6	3.3
Australian Capital Territory	1.4	. .	. .	. .	. .	1.4
Northern Territory	. .	. .	0.0	0.1	0.0	0.0
Australia	1.1	1.1	1.3	1.5	1.9	1.1
Private hospitals						
New South Wales	1.4	0.2	0.0	. .	. .	1.3
Victoria	0.8	0.2	0.0	. .	. .	0.7
Queensland	12.3	3.8	19.7	. .	. .	11.3
Western Australia	0.0	0.0	0.0	. .	0.0	0.0
South Australia	1.4	0.9	9.2	. .	. .	1.5
Tasmania	. .	n.p.	n.p.	n.p.	n.p.	n.p.
Australian Capital Territory	n.p.	. .	. .	. .	. .	n.p.
Northern Territory	. .	. .	n.p.	n.p.	n.p.	n.p.
Australia	3.5	3.9	28.0	. .	0.0	4.4
All hospitals						
New South Wales	1.3	0.9	1.7	3.0	1.8	1.2
Victoria	0.7	0.3	0.2	0.0	. .	0.6
Queensland	7.5	2.6	7.5	4.6	6.2	6.4
Western Australia	0.0	0.0	0.0	0.0	0.0	0.0
South Australia	2.4	2.4	2.2	3.0	0.8	2.4
Tasmania	. .	n.p.	n.p.	n.p.	n.p.	n.p.
Australian Capital Territory	n.p.	. .	. .	. .	. .	n.p.
Northern Territory	. .	. .	n.p.	n.p.	n.p.	n.p.
Australia	**2.1**	**1.9**	**6.3**	**1.5**	**1.7**	**2.4**

Notes

1. Separations for which the care type was reported as *Newborn* with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
2. *Not reported* Indigenous status was not permitted in records for public and private hospitals in Western Australia. Indigenous status was *Not reported* for all Northern Territory private hospital records.

Source: AIHW National Hospital Morbidity Database.

Separation rate ratios

The quality of the Indigenous status data can be broadly assessed by examining Indigenous to non-Indigenous rate ratios. The rate ratios presented in Table 1.3 compare the age-standardised rate for *Indigenous Australians* against the rate for *Other Australians* (includes separations for which the Indigenous status was *Not reported*). If the rate ratio is greater than 1, then the age-standardised rate for *Indigenous Australians* was higher than that for *Other Australians*. In view of the relatively poor health status of the Indigenous

population, rate ratios are expected to be substantially higher than 1 for all or most jurisdictions.

For public hospitals in 2006–07, the Northern Territory had the highest rate ratio (6.8) and rate ratios were relatively high for Queensland, Western Australia and South Australia (4.1, 4.3 and 4.1 respectively). New South Wales, Victoria and the Australian Capital Territory public hospitals had moderately high rate ratios (2.6, 2.5 and 2.5 respectively). Tasmania had the lowest public hospital rate ratio (1.7).

For the private sector, only Western Australia had a rate ratio of greater than 1.0. For all other states and territories, the private hospital rate ratio was less than or equal to 0.5 (that is, *Indigenous Australians* were hospitalised in the private sector at less than half the rate for *Other Australians*) (Table 1.3). Indigenous persons have lower rates of private health insurance coverage than non-Indigenous persons, and that would have an effect on their relative use of private hospitals.

As noted in the 2005 report (AIHW 2005a), caution is required when comparing state ratios because state variations in both population health and non-hospital services can have considerable effects on the rates of hospitalisation. In addition, the rate ratios for the Australian Capital Territory should be interpreted with caution due to its relatively small Indigenous population (and hence wider confidence intervals in Table 1.3).

Changes in Indigenous status reporting 2002–03 to 2006–07

A decrease in the number of records for which Indigenous status was *Not reported* may indicate that the collection of these data had improved. In addition, increases in the proportions of separations for Indigenous persons, or in the rate ratios, may reflect improvements in the quality of the data, or may indicate changes in the use of hospital services.

Separations for which Indigenous status was *Not reported*

Overall, between 2002–03 and 2006–07, the proportion of separations for which Indigenous status was *Not reported* decreased from 3.5% to 2.4%, indicating an improvement in the reporting of these data (Table 1.4).

The proportion of public hospital separations for which Indigenous status was *Not reported* increased slightly from 0.9% to 1.1% (Table 1.4). There were slight increases in non-reporting for public hospitals in New South Wales, Victoria and South Australia, and decreases for Tasmania and the Australian Capital Territory. For private hospitals, the level of non-reporting decreased markedly for Queensland between 2004–05 and 2005–06 and increased slightly for New South Wales and Victoria.

Table 1.3: Separations per 1,000 population, by Indigenous status and hospital sector, states and territories, 2006–07

	NSW	VIC	Qld	WA	SA	Tas	ACT	NT	Australia
Public hospitals									
Indigenous	528.0	624.3	756.7	876.5	929.3	320.3	460.9	1584.8	787.0
Non-Indigenous	203.6	247.8	182.4	206.1	226.4	189.6	185.1	233.0	212.9
Rate ratio	2.59	2.52	4.15	4.25	4.10	1.69	2.49	6.80	3.70
95% CI of RR	*2.57–2.62*	*2.47–2.57*	*4.12–4.18*	*4.21–4.29*	*4.04–4.17*	*1.63–1.75*	*2.37–2.61*	*6.75–6.86*	*3.68–3.71*
Private hospitals									
Indigenous	17.3	32.9	59.6	224.6	33.2	n.p.	n.p.	n.p.	59.7
Non-Indigenous	115.2	143.3	183.2	139.6	134.8	n.p.	n.p.	n.p.	139.2
Rate ratio	0.15	0.23	0.33	1.61	0.25	n.p.	n.p.	n.p.	0.43
95% CI of RR	*0.14–0.16*	*0.21–0.25*	*0.31–0.34*	*1.57–1.64*	*0.22–0.27*	*n.p.*	*n.p.*	*n.p.*	*0.42–0.44*
All hospitals									
Indigenous	545.3	657.2	816.2	1101.1	962.6	n.p.	n.p.	n.p.	846.7
Non-Indigenous	318.8	391.0	365.6	345.7	361.2	n.p.	n.p.	n.p.	352.1
Rate ratio	1.71	1.68	2.23	3.19	2.67	n.p.	n.p.	n.p.	2.40
95% CI of RR	*1.70–1.73*	*1.65–1.71*	*2.22–2.25*	*3.16–3.21*	*2.63–2.70*	*n.p.*	*n.p.*	*n.p.*	*2.40–2.41*

Notes:

1. Separations for which the care type was reported as *Newborn* with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
2. For the Australian Capital Territory, the separation rates and rate ratios are based only on residents of the Australian Capital Territory admitted to an Australian Capital Territory public hospital. For all other jurisdictions, the separation rates and rate ratios include residents of any jurisdiction admitted to hospital.
3. Identification of Indigenous patients was not considered to be complete and completeness varied among the jurisdictions. Indigenous status was *Not reported* for all Northern Territory private hospital records.
4. Rates are directly age standardised to the estimated resident population 30 June 2001.
5. The rate ratio is equal to the age-standardised separation rate for *Indigenous Australians* divided by the age-standardised separation rate for *Other Australians*.

Source: AIHW National Hospital Morbidity Database.

Separation rate ratios

Between 2002–03 and 2006–07, the overall rate ratio of *Indigenous* to *Non-Indigenous* hospital separations increased from 2.0 to 2.4 (Table 1.5). Due to the uncertainty about the quality of Indigenous identification, it is not possible to state whether this increase was due to an increased use of hospital services by Indigenous persons, or to improvements in the identification of Indigenous persons in the hospital data. However, if the rate ratios had remained low, it would not support an assumption of improvement in data quality.

From 2002–03 to 2006–07, separation rate ratios (for Indigenous to non-Indigenous persons) in most states and territories increased. The Australian Capital Territory was the only jurisdiction for which rate ratios decreased over this period for public hospitals. Overall, the rate ratio for public hospitals was relatively high and increased from 3.2 to 3.7. The rate ratio for private hospitals remained very low over this period and showed no obvious trend.

Table 1.4: Proportion of separations with Indigenous status *Not reported*, by hospital sector, states and territories, 2002–03 to 2006–07

	2002–03	2003–04	2004–05	2005–06	2006–07
Public hospitals					
New South Wales	0.6	0.7	1.4	1.3	1.2
Victoria	0.0	0.0	0.0	0.3	0.5
Queensland	1.8	1.7	1.8	1.9	1.8
Western Australia	0.0	0.0	0.0	0.0	0.0
South Australia	2.5	2.8	2.5	2.7	2.9
Tasmania	6.7	5.9	6.9	5.9	3.3
Australian Capital Territory	3.2	3.4	0.7	0.7	1.4
Northern Territory	0.3	0.0	0.1	0.0	0.0
Australia	*0.9*	*0.9*	*1.1*	*1.2*	*1.1*
Private hospitals					
New South Wales	0.1	0.1	0.5	1.1	1.3
Victoria	0.0	0.0	0.0	0.2	0.7
Queensland	22.2	24.0	23.7	9.7	11.3
Western Australia	0.0	0.0	0.0	0.0	0.0
South Australia	2.1	1.4	1.4	1.3	1.5
Tasmania	n.p.	n.p.	n.p.	n.p.	n.p.
Australian Capital Territory	n.p.	n.p.	n.p.	n.p.	n.p.
Northern Territory	n.p.	n.p.	n.p.	n.p.	n.p.
Australia	*7.6*	*7.9*	*7.4*	*4.0*	*4.4*
All hospitals					
New South Wales	0.4	0.5	1.1	1.2	1.2
Victoria	0.0	0.0	0.0	0.3	0.6
Queensland	11.2	12.2	12.3	5.7	6.4
Western Australia	0.0	0.0	0.0	0.0	0.0
South Australia	2.4	2.3	2.1	2.2	2.4
Tasmania	n.p.	n.p.	n.p.	n.p.	n.p.
Australian Capital Territory	n.p.	n.p.	n.p.	n.p.	n.p.
Northern Territory	n.p.	n.p.	n.p.	n.p.	n.p.
Australia	**3.5**	**3.6**	**3.6**	**2.3**	**2.4**

Notes

1. Separations for which the care type was reported as *Newborn* with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
2. Identification of Indigenous patients was not considered to be complete and completeness varied among the jurisdictions. The *Not reported* Indigenous status was not permitted in records for public and private hospitals in Victoria (2002–03 to 2004–05) and Western Australia (2002–03 to 2006–07). Indigenous status was *Not reported* for all Northern Territory private hospital records.

Source: AIHW National Hospital Morbidity Database.

For public hospitals between 2002–03 and 2006–07, the rate ratios were:

- very high and increasing for the Northern Territory
- relatively high and stable for Western Australia
- moderately high and increasing for New South Wales, Victoria, Queensland and South Australia
- low, but increasing for Tasmania
- relatively high and decreasing for the Australian Capital Territory (Table 1.5).

Table 1.5: Rate ratios by hospital sector, states and territories, 2002–03 to 2006–07

	2002–03	2003–04	2004–05	2005–06	2006–07
Public hospitals					
New South Wales	2.1	2.2	2.3	2.5	2.6
Victoria	2.0	2.0	2.0	2.3	2.5
Queensland	3.7	3.9	4.0	4.2	4.1
Western Australia	4.3	4.4	4.4	4.6	4.3
South Australia	3.4	3.7	3.6	3.9	4.1
Tasmania	1.0	1.0	1.1	1.5	1.7
Australian Capital Territory	4.9	4.6	3.6	2.7	2.5
Northern Territory	5.0	5.5	5.9	6.4	6.8
Australia	*3.2*	*3.3*	*3.4*	*3.6*	*3.7*
Private hospitals					
New South Wales	0.1	0.1	0.2	0.1	0.1
Victoria	0.2	0.1	0.1	0.1	0.2
Queensland	0.4	0.4	0.3	0.3	0.3
Western Australia	0.7	1.3	1.5	1.6	1.6
South Australia	0.1	0.4	0.2	0.4	0.2
Tasmania	n.p.	n.p.	n.p.	n.p.	n.p.
Australian Capital Territory	n.p.	n.p.	n.p.	n.p.	n.p.
Northern Territory	n.p.	n.p.	n.p.	n.p.	n.p.
Australia	*0.3*	*0.4*	*0.4*	*0.5*	*0.4*
All hospitals					
New South Wales	1.4	1.5	1.5	1.6	1.7
Victoria	1.3	1.3	1.3	1.5	1.7
Queensland	2.1	2.2	2.2	2.2	2.2
Western Australia	2.7	2.9	3.1	3.2	3.2
South Australia	2.2	2.5	2.4	2.6	2.7
Tasmania	n.p.	n.p.	n.p.	n.p.	n.p.
Australian Capital Territory	n.p.	n.p.	n.p.	n.p.	n.p.
Northern Territory	n.p.	n.p.	n.p.	n.p.	n.p.
Australia	**2.0**	**2.2**	**2.2**	**2.4**	**2.4**

Notes

1. Separations for which the care type was reported as *Newborn* with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
2. Identification of Indigenous patients was not considered to be complete and completeness varied among the jurisdictions. The *Not reported* Indigenous status was not permitted in records for public and private hospitals in Victoria (2002–03 to 2004–05) and Western Australia (2002–03 to 2006–07). Indigenous status was *Not reported* for all Northern Territory private hospital records.
3. The rate ratio is equal to the age-standardised separation rate for *Indigenous Australians* divided by the age-standardised separation rate for *Other Australians*.

Source: AIHW National Hospital Morbidity Database.

For private hospitals, the rate ratios were very low and fairly stable for all states except Western Australia, where they increased from less than 1.0 in 2002–03 to 1.6 in 2006–07.

2 The Indigenous identification quality project

2.1 Introduction

In recent years, states and territories have made efforts to improve the accuracy of Indigenous identification in the health system through ongoing education of the health workforce and in liaison with Indigenous people.

In addition, the analysis of Indigenous status data quality (presented in *Chapter 1*) indicated some improvement in the level of Indigenous identification since the 2005 AIHW report. As a result, a reassessment of the level of Indigenous under-identification across the states and territories was considered necessary.

The purpose of the Indigenous identification quality project was to design and undertake an audit of Indigenous identification covering public and private hospitals. It was planned that the audit would allow:

- estimation of the current level of Indigenous under-identification
- recommendation of the states and territories, with data of an agreed sufficiently acceptable quality, to be included in national analyses of Indigenous hospital separations data
- estimation of correction factors for states and territories, to be used in future *Expenditures on health for Aboriginal and Torres Strait Islander people* reports
- states and territories to monitor changes in the reporting of Indigenous status, following the implementation of specific strategies to improve Indigenous identification.

As noted in *Chapter 1*, the Indigenous identification quality project was undertaken in all states and territories between 2006 and 2008. The project comprised two distinct components:

- the Indigenous identification audit in New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania and the Northern Territory
- the ACT Hospital Data Linkage project in the Australian Capital Territory.

2.2 The Indigenous identification audit

Project organisation

The AIHW and state and territory health authorities from New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania and the Northern Territory worked in collaboration on the Indigenous identification quality project.

The AIHW contributed by obtaining national ethics approval for the project, designing the survey (see *Appendix 2*), calculating the sample size, coordinating the survey, and collating and evaluating the data.

The state and territory health authorities were responsible for obtaining state/territory ethics approval for the project (where applicable), conducting the hospital patient interviews, matching interview results to the hospital admission records, and collating and forwarding the information to the AIHW.

Ethics approval

Research activities undertaken by the AIHW are required to meet ethical standards in maintaining the privacy and confidentiality of information about individual persons. As the project involved direct interviews and the collection of potentially identifiable patient information, the project team at the AIHW sought and obtained approval from the AIHW Ethics Committee during the early stages of the project.

For this project, the AIHW prepared patient information packages to be provided to the patients selected for the survey. These explained the objectives, importance and contents of the interview. The information package also explained that the interview would only proceed if the patient's consent had been obtained. During the interview, the patient was asked about his/her patient record number, sex, Indigenous status, date of birth, country of birth, and usual residential address.

At the completion of all interviews within a hospital, the patients' responses to the interview questions were compared to the information on the hospital's admission record system and a summary report for each hospital was sent to the AIHW.

The reports received by the AIHW included only limited identifiable information such as the patient's year of birth, the postcode of usual residence and the Indigenous status stated at interview. This information allowed future analysis to determine whether the accuracy of the reporting of Indigenous status was affected by the age of the patient, or the distance between the patient's residence and the treating hospital. Hospitals were permitted to encrypt or substitute patient record numbers in their reports to the AIHW to further ensure patient confidentiality.

The requirement for ethics approval varied among the states and territories due to different privacy legislations in different jurisdictions. For the majority of the states and territories, ethics approval was not necessary because the information collected in the hospital audit was already collected by the hospitals. However, some states and territories were required by legislation to obtain ethics approval before collecting the patient data for this study.

2.3 ACT Hospital Data Linkage Project

Project organisation

The AIHW, ACT Health and the ACT Aboriginal health services worked in collaboration on the ACT Hospital Data Linkage Project.

ACT Health and the ACT Aboriginal health services provided identified administrative records for the 2002–03 collection year for use in the linkage project.

The AIHW performed name-based linkage of the two data sets, evaluated the linked data and produced a report on the findings.

Ethics approval

As the data from both of the Aboriginal health services and the ACT public hospital admission records contained identifying information (that is, the patient's name, date of birth, sex and address), ethics approval was obtained for this project from both the AIHW Ethics Committee and the ACT Health and Community Care Ethics Committee. The data were obtained and analysed in accordance with the eleven Information Privacy Principles (IPPs) as set out in the Privacy ACT 1988 (ComLaw 2009).

3 Method

3.1 Introduction

The methods used in the Indigenous identification quality project, were largely based on the pilot study of Indigenous data quality conducted in 1998 (AIHW: Gray 1999).

The 2005 report recommended that the quality of Indigenous identification should be assessed in both public and private hospitals. However, it was decided to limit this project to assess the quality of Indigenous identification in public hospitals only.

For most states and territories, the level of Indigenous identification was assessed by auditing administrative records. For the Australian Capital Territory, a linkage project was used to assess Indigenous identification.

3.2 The Indigenous identification audit

Method

For New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania and the Northern Territory, the audit of Indigenous identification in hospital separations data was undertaken by interviewing a sample of admitted patients in hospitals about their Indigenous status, and comparing the patients' responses with the Indigenous status information recorded on the hospital admission records. The audit was limited to public hospitals due to the difficulty in coordinating timely ethics approval for the project in private hospitals.

Admitted patient data provided for the period February to April 2005 were used to calculate the total numbers of patients expected during the anticipated audit period between February and April 2007.

Following some administrative delays the audit commenced in March 2007, and the results were forwarded to the AIHW as each state completed their project. Between June and October 2007, 8,852 interviews had been conducted in 66 hospitals in six states. The results of the comparison of interview responses to the admission records were completed between:

- March and June 2007 for New South Wales, Queensland and Tasmania
- March and August 2007 for South Australia
- March and September 2007 for Western Australia
- April and October 2007 for Victoria.

The Northern Territory completed the hospital survey in February 2008, and returned the results of 788 interviews in five hospitals.

Sampling strategy

The sampling strategy considered the total population of interest, the Indigenous population of interest, the required sample size and the selection of representative hospitals and patients.

Total population

For this project, the population of interest was all separations for admitted patients in Australian public hospitals during the collection year. It should be noted that the number of separations is a count of episodes, not people, since a person may have more than one admitted patient episode in a financial year. The population was estimated using the number of hospital separations reported for Australian public hospitals in 2004–05 (the most recent published data available at the start of the project). This estimate was disaggregated by jurisdiction, Indigenous status and the remoteness area of the hospital. Due to increased public hospital activity between 2004–05 and 2006–07, this may have underestimated the population of interest.

Indigenous proportion

Based on the number of hospital separations reported for Indigenous patients in Australian public hospitals in 2004–05, the Indigenous proportion was estimated as 5.0% of Australian public hospital separations.

Calculation of sample size

The survey design incorporated stratification by both the state or territory of hospitalisation and the remoteness of the hospital. The design allowed assessment of the level of Indigenous identification both within and across jurisdictions. It also allowed assessment within and across remoteness areas. However, the sample size was insufficient to allow assessment of the quality of Indigenous identification by remoteness areas within jurisdictions.

The formula to determine the required sample sizes by state, hospital and remoteness area is included in *Appendix 1*.

Overall sample size

The sample size for all Australian public hospitals was calculated as Z=439 (Table 3.1), using the formula in *Appendix 1*, where:

- the proportion of separations for Indigenous patients correctly identified was assumed to be 82%, using the under-identification estimates as reported in *Expenditures on health for Aboriginal and Torres Strait Islander peoples, 2001–02* (AIHW 2005b)
- the population of interest was all separations for admitted patients in Australian public hospitals, and the Indigenous proportion was the proportion of separations reported for Indigenous persons in 2004–05
- the relative standard error was 0.10

Alternatively, if the Australian population was considered as the population of interest, then the Indigenous proportion would be estimated at 2.4% of the Australian population, giving a larger sample size of 929 (Table 3.1).

Table 3.1: Sample size calculation by remoteness areas, based on Australian population 30 June 2006, and separations for admitted patients, 2004–05

	Population-based Indigenous proportion				Separation-based Indigenous proportion			
Remoteness area	Estimated separations correctly recorded for Indigenous persons (%)	Proportion population Indigenous (%)	Relative standard error	Sample size	Estimated separations correctly recorded for Indigenous persons (%)	Proportion separations that were for Indigenous persons (%)	Relative standard error	Sample size
Major cities	66	1.1	0.10	4,807	66	1.6	0.10	3,315
Inner regional	66	2.3	0.10	2,238	66	3.1	0.10	1,641
Outer regional	66	5.3	0.10	975	66	12.2	0.10	423
Remote and Very remote	94	24.2	0.10	26	94	50.0	0.10	13
Total		*2.36*		*8,047*		*5.00*		*5,392*
Australia	**82**	**2.36**	**0.10**	**929**	**82**	**5.00**	**0.10**	**439**

Note: An under-identification factor of 82% was used for the Australian total, using the under-identification estimates reported in *Expenditures on health for Aboriginal and Torres Strait Islander peoples, 2001–02* (AIHW 2005b).

Allocation of sample size by remoteness area

Using the proportions correctly identified by remoteness area from the 1998 pilot project, the proportion of Indigenous patients correctly identified as Indigenous was estimated as 66% for *Major cities*, *Inner regional* and *Outer regional* areas. For *Remote* and *Very remote* areas, the proportion of Indigenous patients correctly identified was estimated as 94%.

Using the admitted patient-based Indigenous proportion, the required sample sizes by remoteness area ranged from 3,315 interviews for *Major cities* to 13 interviews for *Remote* and *Very remote* areas (Table 3.1). To produce statistically robust estimates for each remoteness area, the required sample size for all Australian public hospitals combined was 5,392. Alternatively, using the estimated resident Australian population and Indigenous proportion, the required sample size was 8,047 (Table 3.1).

Allocation of sample size by state/territory

The sample size required for each of the states initially participating (New South Wales, Western Australia, South Australia, Queensland and Tasmania) was also calculated using the formula in *Appendix 1*. The proportions of Indigenous patients correctly identified as Indigenous were estimated largely using the state-based results from previous audits (see Table 3.2). The proportions of admitted patient separations identified for Indigenous persons were estimated using the data reported for state and territory public hospitals in 2004–05.

The sample sizes for states and territories with low proportions of admitted patient separations identified for Indigenous persons, were relatively larger than for states and territories with larger proportions.

The relative standard error (RSE) was set to 0.10 to allow a manageable sample size. However, the RSE was set to 0.20 for some jurisdictions, as the required sample size using an RSE of 0.10 would not have been achievable due to time and workforce constraints.

To produce statistically robust estimates by state and territory, the required sample size for all Australian public hospitals was 3,250.

Using the admitted patient based population, the total sample size for Australia was determined as the larger of the sum of sample sizes by remoteness area categories (5,392 in Table 3.1) and the sum of sample sizes for the states and territories (3,250 in Table 3.2). Using the Australian population as the population of interest, a larger sample size of 8,047 was required (Table 3.1).

Table 3.2: Sample size calculation by jurisdiction, based on separations for admitted patients, 2004–05

	Separation-based Indigenous proportion			
State/territory	**Estimated separations correctly recorded for Indigenous persons (%)**	**Proportion separations that were for Indigenous persons (%)**	**Relative standard error**	**Sample size**
New South Wales[(a)]	77	3.12	0.1	957
Victoria[(b)]	80	0.78	0.2	800
Queensland[(c)]	83	7.65	0.1	268
Western Australia[(d)]	94	10.07	0.1	63
South Australia[(e)]	95	3.91	0.1	135
Tasmania[(f)]	70	2.16	0.2	496
Australian Capital Territory[(g)]	70	2.04	0.2	524
Northern Territory[(e)]	95	66.33	0.1	8
Total		*5.00*		*3,250*
Australia[(h)]	**82**	**5.00**	**0.1**	**439**

*Note*s

(a) New South Wales was estimated to have an under-identification factor of 30% based on the findings of a data linkage study (AIHW 2005a).

(b) Victoria was estimated to have an under-identification factor of 25% based on data assessment and a data linkage study (AIHW 2005a).

(c) Queensland was estimated to have an under-identification factor of 20% based on patient interviews and small area assessment (AIHW 2005a).

(d) Western Australia was estimated to have an under-identification factor of 6% based on a data linking exercise and patient interviews (AIHW 2005a).

(e) South Australia and the Northern Territory were estimated to have 0% under-identification (AIHW 2005a). A value of 95% was used for the purpose of estimating a sample size for the survey.

(f) An under-identification factor has not been determined for Tasmania. (AIHW 2005a). A value of 70% was used for the purpose of estimating a sample size for the survey.

(g) The Australian Capital Territory was estimated to have an under-identification factor of 30% based on patient interviews (AIHW 2005a).

(h) An under-identification factor of 82% was used for the Australian total (AIHW 2005b).

Each state and territory was then allocated a proportion of the total sample size, based on the number of Indigenous people living in that state compared to the total number of Indigenous people residing in the participating states. Therefore, New South Wales was allocated 35% of the maximum sample size required for Australia (2,869 interviews), and Tasmania was allocated 7% (581 interviews) (Table 3.3).

Victoria and the Northern Territory agreed to participate in the study after the initial total sample size had been determined. The sample sizes for these two jurisdictions was determined as proportionate to the number of Indigenous people living in them compared to the total number of Indigenous people living in the seven participating jurisdictions. Sample sizes of 1,100 and 800 were allocated to Victoria and the Northern Territory, respectively.

Table 3.3: Final allocation of sample size by state, based on the proportion of Indigenous population resident in the original participating states and territories

	Proportion of Indigenous population (%) 5 jurisdictions	Proportion of Indigenous population (%) 7 jurisdictions	Sample size using separations for admitted patients	Sample size using total resident population	Final allocation
Australia (sum of remoteness areas)			*5,392*	*8,047*	
New South Wales	35%	29%	1,887	2,816	2,869
Queensland	34%	28%	1,833	2,736	2,850
Western Australia	17%	15%	917	1,368	1,401
South Australia	7%	6%	377	563	601
Tasmania	7%	4%	377	563	581
Total for 5 participating jurisdictions					
	100%	**81%**	**5,392**	**8,047**	**8,302**
Victoria	. .	6%	. .	. .	1,100
Northern Territory	. .	12%	. .	. .	800
Total for 7 participating jurisdictions					
		100%			**10,202**

Note: Percentages do not add to 100% due to rounding.

Allocation of sample size for remoteness area categories within each state and territory

The sample sizes for remoteness areas within each jurisdiction were allocated according to the proportion of the jurisdiction's population residing in each area. The sample size estimated for participating states and territories by remoteness area, and the final number of interviews achieved, is presented in *Appendix 1* (see Table A1.2).

The differences between the assigned sample sizes and number of interviews achieved were relatively small for South Australia, Tasmania, Victoria and for most of the remoteness area categories in Queensland. Difficulties experienced in conducting the audit in some remote hospitals resulted in greater variance between the assigned sample sizes and the achieved number of interviews for Western Australia and Queensland. However, adequate sample sizes were achieved for all states and territories (combined), based on the required sample size calculated using the population figures based on separations for admitted patients.

Selection of hospitals

Due to the time constraints in conducting the audit, and to minimise the burden on any one hospital, the selection of participating hospitals was based on their ability to provide sufficient observations and interviews for the audit during the three-month period between February and April 2007.

Hospitals were considered suitable candidates for the audit if they had sufficient patient throughput (both Indigenous and non-Indigenous) to achieve the required sample size within the three-month audit period. In addition, hospitals with at least 50 Indigenous patients during the corresponding period in 2004–05 were given preference to ensure sufficient Indigenous participation in the audit. Therefore, the sample predominantly included either large hospitals or hospitals that had reported high proportions of Indigenous patients during 2004–05.

For the *Remote* and *Very remote* areas (which typically have smaller hospitals), the state and territory health authorities were asked to select suitable hospitals to take part in the audit.

The selection of hospitals is discussed further in *Appendix 1*. The numbers of hospitals on the candidate list provided by the AIHW, and the number of hospitals that conducted interviews, are presented by jurisdiction (see Table A1.2).

Selection of patients

Any patient who had been admitted to the hospital at the time of the audit could be included in the sample. This included same-day patients who are admitted and separated on the same day.

In order to achieve a complete and representative sample for the hospital under study, hospitals were asked to interview a combination of same-day and overnight patients, similar to the hospital's usual same-day/overnight mix. The hospital was also asked to sample all wards (except intensive care units).

Hospitals were asked to interview patients only once, regardless of the number of times they were admitted during the audit period. Therefore, each interview represented an individual.

Patients who were not considered for inclusion in the sample included:

- patients considered by the person in charge of the ward to be too unwell or not competent to give informed consent to be part of the study
- people in intensive care units.

The informed consent of the patient was required before the interview could proceed. Patients aged less than 18 years were considered eligible to take part in an interview provided that a parent or guardian provided consent. The AIHW provided information packages for distribution to the patients during the interview period to inform them of the importance of the project and to encourage participation (see *Appendix 2*).

Completeness and correction factors

Completeness (C) and correction factors (CF) were estimated for each of the audited hospitals with Indigenous patients identified in the interview, using the following formulas:

$C = A/(A+B)$ and

$CF = (A+B)/(A+D)$, where:

- A was the number of patients identified as Indigenous in both interview and hospital records
- B was the number of patients identified as Indigenous at interview but non-Indigenous in hospital records
- D was the number of patients identified as non-Indigenous at interview but Indigenous in hospital records.

Weighted completeness and correction factors were produced at four levels:

- within hospital
- within remoteness area (within each state or territory) (region)
- within state or territory

- within remoteness area, nationally.

See *Appendix 1* for more information.

Weighting

As the study was based on a sample of patients within selected hospitals, there was some potential for bias due to the over- or under-representation of hospitals or remoteness areas in the total sample. Weightings were applied to the estimates of completeness to adjust for over- or under-represented hospitals or remoteness areas.

See *Appendix 1* for more information.

Confidence intervals

Confidence intervals were calculated around the weighted completeness proportions using the Normal approximation method for New South Wales, Queensland, Western Australia and the Northern Territory. For Victoria, South Australia and Tasmania, confidence intervals were calculated using Wilson's score interval to accommodate the small sample size of Indigenous patients at interview in those states and territories.

See *Appendix 1* for more information.

3.3 ACT Hospital Data Linkage Project

In the Australian Capital Territory, Indigenous identification was assessed through the name-based linking of records from ACT public hospital admissions data for 2002–03 with data from the ACT's Aboriginal health service.

The ACT Hospital Data Linkage Project was conducted in 2006 using data for the 2002–03 collection period.

Method

The project method was based on the assumption that Indigenous patients always reported their true Indigenous status to the Aboriginal health service. The patients' Indigenous status data from the Aboriginal health service were then compared to Indigenous status as recorded in the public hospital admissions data.

Selection of patients

To identify the same patient in the two data sources, four data elements were used:

- date of birth (day, month and year of birth)
- name (both forename and surname)
- sex
- address.

Where a complete match of all four data elements was achieved between pairs of records from the two sources of data, it was considered highly likely that the same patient had appeared in both of the data sources.

Record pairs with minor mismatches on some of the data elements were also considered to be potential matches. These minor mismatches may have been caused by typographic errors, recording mistakes, or a change of address. For pairs of patient records which did not achieve exact matching on date of birth, names and sex, some judgment was used to select the patient record pairs for the final list. At the end of the selection process, the final list contained 463 highly likely pairs of patient records from the two data sources.

4 Results

Sections 4.1 presents the raw results of the studies. Section 4.2 presents the estimated Indigenous identification levels, based on weighted data, and Section 4.3 presents the estimated correction factors, which can be used to estimate the 'true' number of Indigenous separations. Section 4.3 also presents information on how the quality of Indigenous identification has changed over time.

4.1 Study results

The Indigenous identification audit

There were 9,640 completed patient interviews in the seven states and territories that participated in the Indigenous identification audit.

Adequate sample sizes were obtained for all states and territories, and for all remoteness areas, nationally. The number of completed interviews for each remoteness area exceeded the required sample sizes specified in Table 3.1, and for each state or territory they exceeded the required sample sizes given in Table 3.2.

Overall, without adjusting for over- or under-represented hospitals or remoteness areas, Indigenous status was correctly recorded in the participating hospitals' admission records for 93% of Indigenous patients (1,285 of 1,380) and 98% of non-Indigenous patients (8,126 of 8,254) (Table 4.1).

Audit results by state and territory

The results of the audit by state and territory are presented in Table 4.1.

The accuracy of the identification of Indigenous persons in the admissions records of participating hospitals ranged from 98% in Western Australia and the Northern Territory to 45% in Tasmania. There was little variation in the accuracy of identifying non-Indigenous persons, ranging from 96% in South Australia to almost 100% in New South Wales.

For New South Wales:

- 93% of Indigenous persons and 100% of non-Indigenous persons were correctly identified in the admission record
- 1% of patients had a *Not reported* Indigenous status in the admission record.

For Victoria:

- 84% of Indigenous persons (21 of 25) and 99% of non-Indigenous persons were correctly identified in the admission record
- Nearly 2% of patients had a *Not reported* Indigenous status in the admission record.

For Queensland:

- 88% of Indigenous persons and 98% of non-Indigenous persons were correctly identified in the admission record
- 2% of patients had a *Not reported* Indigenous status in the admission record.

Table 4.1: Results of the Indigenous identification audit, by state and territory

At interview	Indigenous in hospital record	Non-Indigenous in hospital record	Not stated in hospital record	Total	Correctly recorded (%)	Correction factor (unweighted)
New South Wales						
Indigenous	192	0	15	207	93	1.08
Non-Indigenous	0	2,649	12	2,661	100	1.00
Not stated	0	0	2	2	. .	
Total	192	2,649	29	2,870	99	
Victoria						
Indigenous	21	3	1	25	84	1.19
Non-Indigenous	0	1,045	15	1,060	99	1.01
Not stated	0	0	0	0	. .	
Total	21	1,048	16	1,085	98	
Queensland						
Indigenous	356	44	3	403	88	1.11
Non-Indigenous	7	2,281	48	2,336	98	1.00
Not stated	0	1	0	1	. .	
Total	363	2,326	51	2,740	96	
Western Australia						
Indigenous	237	2	2	241	98	1.01
Non-Indigenous	1	719	5	725	99	1.01
Not stated	0	0	0	0	. .	
Total	238	721	7	966	99	
South Australia						
Indigenous	42	3	0	45	93	1.07
Non-Indigenous	0	546	19	565	96	1.03
Not stated	0	0	0	0	. .	
Total	42	549	19	610	96	
Tasmania						
Indigenous	9	11	0	20	45	2.00
Non-Indigenous	1	544	16	561	97	1.01
Not stated	0	0	0	0	. .	
Total	10	555	16	581	95	
Northern Territory						
Indigenous	428	11	0	439	98	1.01
Non-Indigenous	2	342	2	346	99	0.98
Not stated	3	0	0	3	. .	
Total	433	353	2	788	98	
Total						
Indigenous	1,285	74	21	1,380	93	1.06
Non-Indigenous	11	8,126	117	8,254	98	1.01
Not stated	3	1	2	6	. .	
Total	1,299	8,201	140	9,640	98	

Note: Data for one hospital in Victoria were adjusted to reflect results for that hospital from the 1998 survey, as described in *Appendix 1*.

For Western Australia:

- 98% of Indigenous persons and 99% of non-Indigenous persons were correctly identified in the admission record
- 1% of patients had a *Not reported* Indigenous status in the admission record.

For South Australia:

- 93% of Indigenous persons and 96% of non-Indigenous persons were correctly identified in the admission record
- 3% of patients had a *Not reported* Indigenous status in the admission record.

For Tasmania:

- 45% of Indigenous persons (9 of 20) and 97% of non-Indigenous persons were correctly identified in the admission record
- 3% of patients had a *Not reported* Indigenous status in the admission record

For the Northern Territory:

- 98% of Indigenous persons and 99% of non-Indigenous persons were correctly identified in the admission record
- Less than 1% of patients had a *Not reported* Indigenous status in the admission record.

Table 4.1 also presents raw (unweighted) correction factors for each of the participating states and territories. The 'true' number of records for Indigenous persons in the participating hospitals can be calculated by multiplying the number of Indigenous persons identified in the admission record by the unweighted correction factors. For example, for Western Australia, a correction factor of 1.01 suggests that the 'true' number of records for Indigenous persons in the participating hospitals was about 1% higher than indicated in the hospital admission records and, for Victoria, a correction factor of 1.19 suggests that the 'true' number of records for Indigenous persons was about 19% higher than indicated.

Audit results by remoteness area

The accuracy of the identification of Indigenous persons in the admissions records decreased with decreasing remoteness, with (unadjusted) completeness for the participating hospitals ranging from 97% in *Remote* and *Very remote* areas to 78% in *Major cities*. On the other hand, there was little variation in the accuracy of identifying non-Indigenous persons by remoteness area, ranging from 98% in *Outer regional* areas to 99% in other areas (Table 4.2). Table 4.2 also presents raw (unweighted) correction factors for each remoteness area. For example, for *Major cities*, a correction factor of 1.24 suggests that the 'true' number of records for Indigenous persons in the participating hospitals was about 24% higher than indicated in the hospital admission records.

Table 4.2: Results of the Indigenous identification audit, by remoteness area

At interview	Indigenous in hospital record	Non-Indigenous in hospital record	Not stated in hospital record	Total	Correctly recorded (%)	Correction factor (unweighted)
Major cities						
Indigenous	120	25	9	154	78	1.24
Non-Indigenous	4	4,094	47	4,145	99	1.01
Not stated	0	1	1	2	. .	
Total	124	4,120	57	4,301	98	
Inner regional						
Indigenous	176	13	7	196	90	1.11
Non-Indigenous	1	1,979	30	2,010	99	1.01
Not stated	0	0	1	1	. .	
Total	177	1,992	38	2,207	98	
Outer regional						
Indigenous	307	21	2	330	93	1.05
Non-Indigenous	6	1,556	34	1,596	98	1.01
Not stated	1	0	0	1	. .	
Total	314	1,577	36	1,927	97	
Remote and Very remote						
Indigenous	682	15	3	700	97	1.02
Non-Indigenous	0	497	6	503	99	0.98
Not stated	2	0	0	2	. .	
Total	684	512	9	1,205	98	
Total						
Indigenous	1,285	74	21	1,380	93	1.06
Non-Indigenous	11	8,126	117	8,254	98	1.01
Not stated	3	1	2	6	. .	
Total	1,299	8,201	140	9,640	98	

Note: Includes data for New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania and the Northern Territory.

ACT Hospital Data Linkage Project

For data extracted from the Aboriginal health service records, the Indigenous status could be recorded as 'Aboriginal', 'Torres Strait Islander', or 'Both Aboriginal and Torres Strait Islander'. For ACT public hospitals, the patients' Indigenous status could be recorded as 'Aboriginal', 'Torres Strait Islander', 'Both Aboriginal and Torres Strait Islander', or 'Non-Indigenous'.

The results of the ACT Hospital Data Linkage Project are presented in Table 4.3. Of the 463 patients recorded as Indigenous in the Aboriginal health service records, 272 were recorded as Indigenous on the ACT public hospital admissions record, and 191 were recorded (incorrectly) as Non-Indigenous.

Table 4.3: Number of matches for patients' Indigenous status between the ACT Aboriginal health service data and ACT public hospitals admissions records, 2002–03

Indigenous status on Aboriginal health service record	Indigenous status on hospital record					
	Aboriginal	Torres Strait Islander	Both Aboriginal and Torres Strait Islander	Total Indigenous	Non-Indigenous	Total
Aboriginal	239	3	24	266	183	449
Torres Strait Islander	1	1	1	3	4	7
Both Aboriginal and Torres Strait Islander	0	1	2	3	4	7
Total Indigenous	240	5	27	272	191	463

Note: Data based on the ACT Hospital Data Linkage Project which compared data from the 2002–03 collection period.

For the Australian Capital Territory:

- 59% of Indigenous persons (272 of 463) were correctly identified in the admission record
- the proportion of non-Indigenous persons correctly identified in the admission record was not assessed.

4.2 Estimated Indigenous identification levels in hospital admissions data

This section presents estimates of Indigenous identification levels for each state and territory and by remoteness areas. The raw results from the audit were adjusted for the representativeness of the surveyed hospitals, and 95% confidence intervals calculated.

Indigenous identification audit

The results of the Indigenous identification audit may have been biased if Indigenous patients were either over- or under-represented due to the sampling strategy (see *Appendix 1*).

To account for any potential bias, the AIHW applied weightings to the data for each hospital and each remoteness area audited. The weightings were based on the observed number of Indigenous separations in the audit compared to the expected number of Indigenous separations in each hospital, remoteness area, state or territory. These weightings were applied to the raw estimates of completeness to produce adjusted estimates of completeness (Table 4.4). In some cases, minor modifications to the method were used to produce the estimates by state and territory. These modifications are detailed in *Appendix 1*.

Generally, the adjusted estimates of completeness were lower than the unadjusted estimates. This indicated that the audit was conducted in hospitals that had higher proportions of admissions for Indigenous persons than the proportion for the state or territory overall. For Tasmania, the weighted completeness figures were higher than those calculated from the raw audit data.

ACT Hospital Data Linkage project

The results of the ACT Hospital Data Linkage project were not adjusted, therefore weighted completeness factors are not presented in Table 4.4.

Overall

Overall, after adjusting the audit results for over- or under-represented hospitals or remoteness areas, 89% of Indigenous patients were estimated to be identified correctly in hospital admission records (Table 4.4).

There was some variation in the estimated completeness of Indigenous identification by both state and territory and remoteness area.

Indigenous identification by state and territory

The weighted completeness factors for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory indicate that the levels of Indigenous identification in their hospital admissions data were acceptable for the purposes of data analysis, being 80% or higher. Levels of weighted completeness (percentage of separations for Indigenous persons correctly identified) ranged from 84% in Victoria to 97% in Western Australia. Hence, levels of under-identification ranged from 3% in Western Australia to 16% in Victoria.

Table 4.4: Estimates of completeness and correction factors from the Indigenous identification audit project (2007 and 2008 data) and the ACT Hospital Data Linkage project (2002–03 data), by state and territory

State	Completeness	Weighted[(a)] Completeness	95% confidence interval[(b)]
New South Wales	93%	88%	84%–93%
Victoria[(c)]	84%	84%	75%–100%
Queensland	88%	86%	82%–89%
Western Australia	98%	97%	95%–99%
South Australia	93%	87%	80%–100%
Tasmania[(d)]	45%	48%	34%–82%
Australian Capital Territory[(e)]	59%	n.a.	n.a.
Northern Territory	98%	96%	95%–98%
Total[(f)]	93%	89%	87%–91%

Notes

(a) The weighted completeness percentages presented in the table were estimated using a weighting system and therefore will be different to the crude proportion of patients identified as Indigenous in both the interview and hospital admission records.

(b) The 95% confidence intervals were calculated using the Normal approximation method, except for Victoria, South Australia and Tasmania. For those three states, they were calculated using Wilson's score interval to accommodate the small number of Indigenous patients at interview.

(c) Estimated results for Victoria were based on an alternative method as detailed in the text.

(d) Estimates for Tasmania were based on audit results from *Inner regional* and *Outer regional* hospitals only.

(e) Estimates for the Australian Capital Territory were based on the ACT Hospital Data Linkage project which used data from the 2002–03 collection period.

(f) The total excludes data for the Australian Capital Territory.

Tasmania's audit results indicated that the level of Indigenous identification was not acceptable for reporting purposes (45% unadjusted and 48% adjusted). However, the width of the confidence interval (34% to 82%) indicated that a larger sample would be necessary to produce a reliable estimate.

Indigenous identification by remoteness area

For all remoteness areas, the level of Indigenous identification (not less than 80%) was considered acceptable for analysis purposes (Table 4.5). The weighted completeness factors ranged from 80% for *Major cities* to 97% in *Remote* and *Very remote* areas. The weighted completeness factors for *Outer regional*, *Remote* and *Very remote* areas suggest a relatively low level of under-identification.

Table 4.5: Adjusted estimates of completeness and adjusted correction factors, by remoteness areas, audit results[(a)]

Remoteness area	Completeness	Weighted[(b)] Completeness	95% confidence interval[(c)]
Major cities	78%	80%	73%–86%
Inner regional	90%	87%	82%–91%
Outer regional	93%	94%	91%–96%
Remote and Very remote	97%	97%	96%–98%
Audit total	93%	89%	87%–91%

Notes

(a) Includes data for 2007 for New South Wales, Victoria, Queensland, Western Australia, South Australia and Tasmania and for 2008 for the Northern Territory.

(b) The weighted completeness percentages presented in the table were estimated using a weighting system and therefore will be different to the crude proportion of Indigenous patients identified in both the interview and hospital admission records.

(c) The 95% confidence intervals were calculated using the Normal approximation method.

4.3 Discussion

This section presents the conclusions of the studies and how Indigenous identification has changed since the 2005 report. It also presents estimated correction factors that can be applied to the data to estimate true numbers of separations for Indigenous patients.

States and territories

Following the release of the 2005 report (AIHW 2005a), the analysis of hospital separations data for Indigenous persons had been restricted to the data for states and territories, with an acceptable level of Indigenous identification, agreed to be 80% or greater. The report found that the following states and territories had acceptable data: Queensland, South Australia, Western Australia and the Northern Territory (public hospitals only).

Using the 80% identification standard, the results of this project indicate that New South Wales and Victoria also had acceptable levels of Indigenous identification in public hospital admitted patient data. The project found that 88% and 84% of Indigenous persons were correctly identified in New South Wales and Victorian public hospitals data respectively (Table 4.4).

Using the audit results for New South Wales, Victoria, Queensland, Western Australia, South Australia and Northern Territory only, and after adjusting for over- or under-represented hospitals or remoteness areas, 90% of Indigenous patients were estimated to be identified correctly in hospital admission records for the six states and territories (Table 4.6).

Changes over time

The results of this project were compared to the most recent previous studies (Table 4.6). However, it should be noted that the previous studies differed in methodologies and in coverage.

This project indicated that levels of Indigenous identification had increased since the 2005 report for New South Wales, Victoria, Queensland, Western Australia and the Northern Territory. For South Australia, the estimated level of Indigenous identification had decreased from 95% to 87%, but was still regarded as acceptable.

For Tasmania, the audit indicated low levels of identification. However, it should be noted that this was based on a relatively small sample of Indigenous patients. A previous assessment of Indigenous identification was not available for Tasmania.

Table 4.6: Comparison of adjusted estimates of Indigenous identification from previous surveys and the 2007/2008 Indigenous identification quality project, by state and territory

Region	Previous estimate	Date of previous survey study	Indigenous identification project 2007/2008
State/territory			
New South Wales[(a)]	77%	1997–98	88%
Victoria[(b)]	80%	1994–98	84%
Queensland[(c)]	83%	2000	86%
Western Australia[(d)]	94%	2001	97%
South Australia[(e)]	95–100%	2001–02	87%
Tasmania[(f)]	. .	. .	48%
Australian Capital Territory[(g)]	70%	2001–02	59% (2002–03 data)
Northern Territory[(e)]	95–100%	1999	96%
Australia[(h)]	**82%**	**2001–02**	**89%**
Australia excluding ACT and Tasmania	**. .**	**. .**	**90%**

Notes

(a) New South Wales was estimated to have an under-identification factor of 30%, based on the findings of a data linkage study using 1997–98 data (AIHW 2005a).

(b) Victoria was estimated to have an under-identification factor of 25% for 1994–98, based on data assessment and a data linkage study (AIHW 2005a).

(c) Queensland was estimated to have an under-identification factor of 20%, based on patient interviews and small area assessment, 2000 (AIHW 2005a).

(d) Western Australia was estimated to have an under-identification factor of 6%, based on a data linking exercise and patient interviews, 2001 (AIHW 2005a).

(e) South Australia (2001–02) and the Northern Territory (1999) were estimated to have 0% under-identification (AIHW 2005a). A value of 95% was used for the purpose of estimating a sample size for the audit.

(f) An under-identification factor had not been determined for Tasmania (AIHW 2005a). A value of 70% was used for the purpose of estimating a sample size for the audit.

(g) The Australian Capital Territory was estimated to have an under-identification factor of 30% based on patient interviews in 2001–02 (AIHW 2005a). Estimates for the current study were based on the ACT Hospital Data Linkage project which used data from 2002–03.

(h) An under-identification factor of 82% was used for the Australian total for 2001–02 (AIHW 2005b). The estimate for the 2007/2008 data excludes Tasmania and the Australian Capital Territory.

For the Australian Capital Territory, the data linkage project results indicated that the levels of Indigenous identification were lower than found in previous assessments (Table 4.6). However, it should be noted that the linkage project was performed using data from 2002–03, and therefore these results may not reflect the current situation.

Between 2002–03 and 2006–07, the Indigenous to non-Indigenous separation rate ratios for public hospitals were relatively high and increasing for New South Wales and Victoria (Table 1.5). This may indicate that the levels of Indigenous identification in New South Wales and Victoria had improved gradually as a result of education and changes in practices. For Victoria, there had been an increase in the rate ratio in 2005–06. Both states advised that the levels of Indigenous identification had shown consistent improvement, and that an acceptable level of identification was likely to have been achieved during the 2004–05 collection period.

Therefore, it is recommended that New South Wales and Victorian data from 2004–05 onwards should be included in national analyses of Indigenous hospitalisations.

Remoteness areas

The 2005 report (AIHW 2005a) advised that, in general, analyses of separations for Indigenous persons by remoteness areas should not be undertaken, as variation in identification by remoteness could bias the results.

As the recommendation for analyses by state and territory exclude the data for Tasmania and the Australian Capital Territory, estimates of weighted completeness by remoteness area have been prepared excluding those jurisdictions. With the exclusion, levels of Indigenous identification by remoteness areas increased from 87% to 90% in *Inner regional* areas, and increased slightly for *Outer regional* areas. Overall, then, the results of the project indicate that all remoteness areas had achieved acceptable levels of Indigenous identification, ranging from 80% in *Major cities* to 97% in *Remote* and *Very remote* areas (Table 4.7). Hence, it is acceptable to undertake analyses of separations for Indigenous patients by remoteness for those jurisdictions. However, the variation in completeness by remoteness area (particularly for *Major cities* in comparison to other areas) should continue to be taken into consideration in interpretation of the data.

Table 4.7: Adjusted estimates of completeness and adjusted correction factors, by remoteness area, for New South Wales, Victoria, Queensland, Western Australia, South Australia and Northern Territory

Remoteness area	Completeness	Weighted[(a)] Completeness	95% confidence interval
Major cities	78%	80%	73%–86%
Inner regional	92%	90%	86%–94%
Outer regional	95%	94%	92%–97%
Remote and Very remote	97%	97%	96%–98%
Total[(b)]	94%	90%	88%–91%

Notes

(a) The weighted completeness percentages presented in the table were estimated using a weighting system and therefore will be different to the crude proportion of Indigenous patients identified as in both the interview and hospital admission records.

(b) Includes 2007 data for New South Wales, Victoria, Queensland, Western Australia and South Australia, and 2008 data for the Northern Territory.

Changes over time

For remoteness areas, previous estimates of Indigenous identification were obtained from the 1998 pilot project. Improvements in identification were apparent for all areas, in particular for *Major cities*, *Inner regional* and *Outer regional* areas (Table 4.8).

Table 4.8: Comparison of adjusted estimates of Indigenous identification from previous surveys and the Indigenous identification quality project, by remoteness areas

Region	Previous estimate	Date of previous survey data	Indigenous identification project 2007/2008 (excluding ACT and Tasmania)
Remoteness areas[(a)]			
Major cities	66%	1998	80%
Inner regional	66%	1998	90%
Outer regional	66%	1998	94%
Remote and Very remote	94%	1998	97%
Australia[(b)]	**82%**	**2001–02**	**90%**

Notes

(a) For remoteness areas, the proportions correctly identified in previous surveys were sourced from the 1998 pilot project.

(b) An under-identification factor of 82% was used for the Australian total (AIHW 2005b).

Estimated correction factors

Table 4.9 presents weighted correction factors for each state and territory, and for remoteness areas. These correction factors can be used to estimate the 'true' number of records for Indigenous persons, by multiplying the number of Indigenous persons identified in admission records by the weighted correction factors. For example, for Australia, the correction factor of 1.12 suggests that the 'true' number of records for Indigenous persons was about 12% higher than indicated in the hospital admission records.

Caution should be exercised in the use of the correction factors, and especially in applying them to particular categories of hospital separations (for example, separations for particular procedures or particular age groups). This is because they have been (generally) estimated based on all separations and their applicability to subsets of separations is unknown.

States and territories

Estimated correction factors for each state and territory, based on the weighted completeness results, are presented in Table 4.9. They ranged from 1.03 for Western Australia to 2.00 for Tasmania.

The estimated correction factors for New South Wales, Victoria, Queensland, South Australia, Western Australia and the Australian Capital Territory were adopted for use in *Expenditures on health for Aboriginal and Torres Strait Islander people 2004–05* (AIHW 2008). No correction factor was applied for the Northern Territory, as it had not completed the audit at the time of the report. However, previous surveys had found that the level of Indigenous identification in hospital separations data in the Northern Territory was very high.

The audit conducted in Tasmania resulted in a very small sample of Indigenous patients and the relative standard error was fairly large (20%). Therefore, both the raw results and the

adjusted estimates were not considered to be reliable, and the estimated correction factor for Tasmania was not applied in the above report (AIHW 2008).

Remoteness areas

The weighted correction factors for each remoteness area are presented in Table 4.9, excluding the data for Tasmania. They ranged from 1.03 for *Remote* and *Very remote* areas to 1.25 for *Major cities*.

Table 4.9: Estimated correction factors by state and territory, and remoteness areas

State	Correction factor	Remoteness area	Correction factor (excludes ACT and Tasmania)
New South Wales	1.13	**Major cities**	1.25
Victoria	1.20	**Inner regional**	1.11
Queensland	1.13	**Outer regional**	1.06
Western Australia	1.03	**Remote and Very remote**	1.03
South Australia	1.15	**Total**	**1.12**
Tasmania[(a)]	2.00		
Australian Capital Territory	1.70		
Northern Territory	1.02		
Total[(b)]	**1.12**		

Notes

(a) The raw results, adjusted estimates and the estimated correction factor for Tasmania were not considered to be reliable.

(b) Excludes Tasmania and the Australian Capital Territory.

5 Recommendations

5.1 Amendments to the analysis guidelines

Based on the results of the audit the following amendments have been made to the analysis guidelines:

- *That New South Wales and Victoria hospitalisations for Indigenous people (both public and private hospitals) be included in comparative analyses in national reporting, commencing with the data collected in 2004–05.*
- *That analysis of separations for Indigenous people by remoteness area of either the patient's usual residence or the hospital's location should be undertaken, based only on data for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory (public hospitals only) in aggregate.*

It is recommended that analyses based on data for these six states and territories should be accompanied by caveats about:

- limitations imposed by jurisdictional differences in data quality
- the data not necessarily being representative of the jurisdictions excluded
- the possible contribution of changes in ascertainment of Indigenous status to changes in hospitalisation rates for Indigenous people.

The recommendation to include New South Wales admitted patient data from 2004–05 in the national reporting of Indigenous hospitalisations was sent to the Statistical Information Management Committee (SIMC) in July 2007 and to the National Advisory Group on Aboriginal and Torres Strait Islander Health Information and Data (NAGATSIHID), and the Australian Hospital Statistics Advisory Committee (AHSAC) in August 2007. Following endorsement by those committees, the recommendation was also endorsed by the National Health Information Management Principal Committee (NHIMPC).

The recommendation to include Victorian admitted patient data from 2004–05 in the national reporting of Indigenous hospitalisations was sent to the SIMC and NAGATSIHID in October 2007. Following endorsement by those committees, the recommendation was also endorsed by the NHIMPC.

The recommendation that Indigenous status information for hospitals in only New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory (public hospitals only) should be used for analytical purposes, for individual jurisdictions or in aggregate, was endorsed by the National Health Information Standards and Statistics Committee (NHISSC) in June 2009.

The recommendation to include aggregate data only for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory (public hospitals only) in analyses of separations for Indigenous people by remoteness area, of either the patient's usual residence or the hospital's location, was also endorsed by the NHISSC in June 2009. In addition, the NHISSC also endorsed the use of data in all states and territories to undertake analyses by:

- *the state or territory of the patient's area of usual residence, for patients usually resident in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory, for individual jurisdictions or in aggregate*
- *the remoteness area of the patient's area of usual residence, for patients usually resident in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory, in aggregate.*

5.2 Summary of data analysis guidelines and recommendations

This section presents an updated summary of the data analysis guidelines and recommendations for improving Indigenous identification in separations data, that were originally presented in *Improving the quality of Indigenous identification in hospital separations data* (AIHW 2005a).

Following the results of the Indigenous identification audit and endorsement by national committees, data analysis guidelines 5, 6 and 7 have been updated to include New South Wales and Victoria, and to reflect that analysis can also be undertaken by the state or territory of residence for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory.

Data analysis guideline 14 has been updated to reflect that analysis by remoteness areas is acceptable for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory, in aggregate, by either the state or territory of hospitalisation or the state or territory of residence.

Data analysis guidelines 9, 10, 12 and 13 have not been changed. Changes to the guidelines are indicated in *italics*.

Data analysis guidelines

Use of factors to adjust for under-identification of separations for Indigenous patients

1. In the absence of an up-to-date and robust set of factors based on a uniform methodology for all jurisdictions, factors should not be used to adjust for under-identification in the analysis of Indigenous status information in hospital separations data.

2. Use of under-identification factors as currently available is, however, acceptable for analyses for which adjustment is a necessary component—for example, in the estimation of health expenditures for Indigenous people.

Treatment of separations for which Indigenous status is unreported

3. The 'Not stated/inadequately described' separations should be amalgamated with the separations for non-Indigenous people in all analyses of Indigenous status information in hospital separations data.

4. Any reporting of separations for which Indigenous status is 'Not stated/inadequately described' should be accompanied by a warning that this category is not accommodated in the data systems of certain jurisdictions.

Use of state and territory data

5. *When using Indigenous status information for analytical purposes, the data for only New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory (public hospitals only) should be used, individually or in aggregate.*

It is also acceptable to use data from hospitals in all states and territories to undertake analyses by the state or territory of the patient's area of usual residence, for patients usually resident in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory, for individual jurisdictions or in aggregate.

6. *Analyses based on data for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory (public hospitals only) in aggregate should be accompanied by caveats about limitations imposed by jurisdictional differences in data quality, and about the data not necessarily being representative of the jurisdictions excluded.*

7. *Caution should be exercised in time series analysis of data for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory (individually or in aggregate) and caveats should include the possible contribution to changes in hospitalisation rates for Indigenous people of changes in ascertainment of Indigenous status for Indigenous patients.*

Use of private hospital data

8. In the case of Indigenous status information in relation to public and private hospitals, data should be analysed for the combined public and private sectors or the public sector alone. Data for the private sector alone should not be used.

Use of data for the Indigenous subcategories

9. Use of data reported for the 'Aboriginal but not Torres Strait Islander origin' subcategory is recommended for Queensland, Western Australia, South Australia and the Northern Territory, individually or in aggregate.

10. Use of data reported for the 'Torres Strait Islander but not Aboriginal origin' subcategory is recommended for Queensland and (with caution) for Queensland, Western Australia, South Australia and the Northern Territory in aggregate.

11. Separate use of data reported for the 'Both Aboriginal and Torres Strait Islander origin' subcategory is not recommended.

12. Use of the combined subcategories 'Torres Strait Islander but not Aboriginal origin' and 'Both Aboriginal and Torres Strait Islander origin' is recommended for Queensland and (with caution) for Queensland, Western Australia, South Australia and the Northern Territory in aggregate.

13. Use of the combined subcategories 'Aboriginal but not Torres Strait Islander origin' and 'Both Aboriginal and Torres Strait Islander origin' is recommended for Queensland, Western Australia, South Australia and the Northern Territory, individually or in aggregate.

Regional analysis of separations data

14. *Analysis of data by remoteness area of the hospital's location can be undertaken for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory, in aggregate.*

It is also acceptable to use data from hospitals in all states and territories to undertake analysis by the remoteness area of the patient's area of usual residence, for patients usually resident in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory, in aggregate.

Analyses based on remoteness area should be accompanied by caveats about limitations imposed by jurisdictional differences in data quality, and about the data not necessarily being representative of the jurisdictions that are not included.

Use of age standardisation and population data

15. Indirect age standardisation is recommended for comparing the separation rate for a single Indigenous population of interest with the rate for a single not-reported-as-Indigenous comparison group.

16. For comparing separation rates for Indigenous and not-reported-as-Indigenous populations across multiple jurisdictions, time periods or other groupings, direct age standardisation should be used whenever populations are large enough to provide reliable results.

17. When deriving age-standardised Indigenous separation rates, age groups should be amalgamated where greater than an age determined by analysis of the data in question, as necessary, to ensure that all age groups have sufficient numbers for reliable results.

18. When deriving separation rates for Indigenous populations, the official ABS population estimates or projections should be used without adjustment for possible under-identification in those data.

19. Reporting of Indigenous separation rates based on the ABS population projections should indicate whether the high or low projection series was used. The low series is recommended.

Summary of recommendations for improving Indigenous identification in separations data

For more information, refer to *Improving the quality of Indigenous identification in hospital separations data* (AIHW 2005a).

Data collection processes

1. [High priority] Procedures should be established in all hospitals to ensure ascertainment of Indigenous status for every patient at every admission.

2. [High priority] Indigenous status information should be ascertained for patients being admitted at all public and private hospitals, using the standard Indigenous identification question formulated by the ABS, as set out in the *National health data dictionary*.

3. [High priority] The data recording systems of all hospitals and health authorities should classify Indigenous status using the standard in the *National health data dictionary*. In particular:

(a) With the exception of forms for patients to complete, a 'Not stated/inadequately described' category should always be provided.

(b) Responses of 'Not stated/inadequately described' should be permitted in separations records hospitals forward to health authorities.

(c) Data recording systems should not include arrangements whereby the category 'Not stated/inadequately described' (or no category selected at all) defaults either manually or automatically to the 'Neither Aboriginal nor Torres Strait Islander origin' category.

4. Procedures and training should be introduced to ensure that data collection staff ascertain the Indigenous status of all babies born at the hospital and other patients aged less than 1 year. These arrangements should take into consideration the Indigenous status of both the mother and the father, as necessary.

5. A protocol should be established to specifically exclude non-Australian Indigenous patients from identification as Aboriginal or Torres Strait Islander.

Training of data collection staff

6. [High priority] Comprehensive training in data collection and data quality should be provided to all staff involved in the collection of patient information at all public and private hospitals. It should be provided on an as-needs basis to all new staff and as periodic refresher training to established staff.

7. [High priority] The training should include the asking about and recording of Indigenous status, and it should accord with the standard package developed by the ABS. It should be directed towards a specific set of outcomes for hospital staff.

8. [High priority] The training efforts of both public and private hospitals should be supported by provision of centralised training of trainers, a policy and procedures manual, and a question and answer guide.

9. At all hospitals the adequacy of training should be periodically assessed by means of direct evaluation of training outcomes and audits of Indigenous identification.

10. Training of data collection staff should be augmented by their direct participation in the conduct and evaluation of hospital-based data quality audits.

Organisational policies and practices

11. [High priority] Health authorities should give consideration to the carrying out of a thorough review of state-wide procedures for the collection, recording and verification of Indigenous status information as the basis for planning action to improve Indigenous status data quality.

12. Mechanisms should be established to increase hospital administrators' commitment to improved Indigenous status data quality—for example, by incorporating requirements in service agreements and identifying sources of funding to be directed at the adoption of improved arrangements in private hospitals.

13. Hospital administrators should be encouraged to accompany improved data collection practices with sound arrangements for system oversight and the employment of Indigenous hospital liaison officers.

14. Consideration should be given to instituting a scheme for public recognition of best practice in ascertaining the Indigenous status of hospital patients.

15. An assessment should be made of the potential role of public education in relation to asking about the Indigenous status of hospital patients.

Data monitoring and audit

16. [High priority] Each jurisdiction should introduce arrangements for regular monitoring of Indigenous status information in separation records, as a basis for providing continuing feedback on data quality at the hospital level and evaluating changes in data quality stemming from the adoption of new data collection practices.

17. An audit of Indigenous identification using patient interviews or another robust methodology should be periodically conducted for public and private hospitals on a nationally coordinated basis, in order to assess data quality and generate comparable and up-to-date under-identification factors.