

# 4 Hospital admissions and expenditure for Aboriginal and Torres Strait Islander patients

Hospital expenditure is a major portion (38%) of total health services expenditure, so estimating hospital expenditure is crucial in estimating total expenditure. It is an area where the data are more easily reconciled than in any other major area of Aboriginal and Torres Strait Islander health services, but there are also inadequacies in the data and it must be interpreted with care.

## Estimating the under-identification of Aboriginality in hospital records

Under-identification in service records is the largest single issue in the estimation of Aboriginal and Torres Strait Islander health expenditures. As pointed out in the 1995–96 report, estimating the magnitude of under-identification is complicated by dependence on a combination of self-identification and community acceptance, which may be highly variable according to context. In some environments it is not safe to identify oneself as Indigenous. However, some benchmark is needed and self-identification in the Census is commonly taken as the base.

Admitted patient hospital treatment is the only health service in which the Indigenous status of patients is, in principle, collected routinely. In the first report, hospitalisation represented about 40% of all the estimated expenditures for and by Aboriginal and Torres Strait Islander people and a much higher proportion (nearly 53%) of expenditures by State and Territory Governments. Although some limited surveys have been conducted in other services, admitted patient usage data are the base for many of the States' estimates for non-admitted patient use, and in some jurisdictions for community health services as well. The methodology in the first report was to allocate expenditures according to the proportion of cost-weighted separations reported for Aboriginal and Torres Strait Islander people, adjusted for the estimated level of under-identification in each jurisdiction, and with costs adjusted for length of stay. A similar methodology has been used in this report although some of the adjustments for relative treatment costs are more sophisticated.

### The 1995–96 results

The 1995–96 report used a mixture of State authority estimates, anecdotal evidence and a test of 'reasonableness' to estimate the likely understatement of Aboriginal and Torres Strait Islander use of acute-care institutions. Although it was unlikely to be completely satisfactory, it was assumed that for the Northern Territory and Western

Australia coverage was complete. There was likely to be under- and over-identification in these States, so it was assumed that these errors balanced and that the reported proportions were the best estimates of the true proportions.

The estimate for under-identification in New South Wales (33%) was supported by work done by the State Health Department, although the figure finally adopted was a little higher than the State's preferred one. There was no comprehensive evidence in the other States, although some limited surveys of individual institutions had been done, and Queensland had applied some local indicators drawn from them. Use in the Australian Capital Territory was clearly under-reported considerably. Because there was almost no reporting of Aboriginal and Torres Strait Islander use in Tasmania, its figures were constructed from the data for other States. The national average under-identification factor, weighted for Aboriginal and Torres Strait Islander hospital use, was 17%, which implied an expansion of 20% in the reported usage figures nationally. This under-identification factor was critical to many of the estimates of State and Territory government expenditures on Aboriginal and Torres Strait Islander people. It was also applied to the results of the sample surveys of Medicare and Pharmaceutical Benefits Scheme (PBS) use and therefore to some Commonwealth expenditures as well.

For public acute-care institutions, Table 4.1 shows the reported separation rates per 1,000 population for Aboriginal and Torres Strait Islander and non-Indigenous people, and the ratios of Aboriginal and Torres Strait Islander to non-Indigenous use finally adopted. (In all the usage tables, no figures are shown for Tasmania or the Australian Capital Territory because of large reporting errors. Outlays in these jurisdictions have been estimated in another way.)

**Table 4.1: Separation rates per 1,000 population, public acute-care institutions, Indigenous status by State, 1995-96**

Indigenous status	NSW	Vic	Qld	WA	SA	NT
<b>Base rates</b>						
Indigenous	231	238	348	481	427	492
Other	201	191	186	180	214	158
<b>Estimated under-identification (%)</b>	33	25	15	—	10	—
<b>Ratio: Indigenous/other</b>						
Base	1.15	1.25	1.87	2.67	2.00	3.10
Adjusted	1.73	1.67	2.38	2.67	2.23	3.10

The adjusted ratios were consistent with the demography of the various States and Territories. They were also consistent with the expectation that Aboriginal and Torres Strait Islander health status would be lowest, and reliance on public hospital admission would be highest, where the proportion of the Aboriginal and Torres Strait Islander population living in remote areas was greatest. However, it was clear that, even after adjustment, use in New South Wales and Victoria differed significantly from the other jurisdictions.

## Reported results, 1998–99

Table 4.2 shows the reported separation rates per 1,000 population for Aboriginal and Torres Strait Islander and non-Indigenous people in each jurisdiction in 1998–99, distinguishing between same-day admissions (of which repeated admissions for renal dialysis are an important component in some jurisdictions) and overnight admissions. Percentage changes over 1995–96 are also shown. As can be seen:

- (a) In every State and Territory except South Australia the ratio of reported Aboriginal and Torres Strait Islander to non-Indigenous separation rates increased. The South Australian figure barely changed.
- (b) For both the Aboriginal and Torres Strait Islander and non-Indigenous populations, all of the increase was in same-day admissions. Except for Aboriginal and Torres Strait Islander patients in Queensland, all overnight admission rates fell.
- (c) The differences widened between New South Wales and Victoria on the one hand and Queensland, Western Australia and the Northern Territory on the other. South Australian rates remained higher than in the two largest States but the difference did not increase.
- (d) Reported increases in the northern and western States were substantial.

**Table 4.2: Reported separation rates per 1,000 population, public acute-care institutions, Indigenous status by State, 1998–99**

Indigenous status	NSW	Vic	Qld	WA	SA	NT	Aust
<b>Base rates</b>							
<b>Indigenous</b>							
Same day	82	112	181	206	200	336	166
Overnight	164	147	237	361	269	265	225
<b>Total</b>	<b>246</b>	<b>259</b>	<b>418</b>	<b>567</b>	<b>469</b>	<b>601</b>	<b>391</b>
<b>Other</b>							
Same day	81	100	89	84	106	70	90
Overnight	117	107	109	97	128	95	111
<b>Total</b>	<b>199</b>	<b>208</b>	<b>198</b>	<b>181</b>	<b>233</b>	<b>165</b>	<b>201</b>
<b>Ratio: Indigenous/other</b>	<b>1.24</b>	<b>1.25</b>	<b>2.11</b>	<b>3.13</b>	<b>2.01</b>	<b>3.65</b>	<b>1.94</b>
<b>Percentage increase: 1998–99 / 1995–96</b>							
<b>Indigenous</b>							
Same day	26	44	50	75	30	46	47
Overnight	–1	–8	4	–1	–2	1	1
<b>Total</b>	<b>7</b>	<b>9</b>	<b>20</b>	<b>18</b>	<b>10</b>	<b>22</b>	<b>16</b>
<b>Other</b>							
Same day	7	21	20	18	23	13	17
Overnight	–6	0	–3	–11	—	–2	–4
<b>Total</b>	<b>–1</b>	<b>9</b>	<b>6</b>	<b>—</b>	<b>9</b>	<b>4</b>	<b>4</b>

Note: Australian total includes estimates for Tasmania and the Australian Capital Territory.

Adjustment for previously estimated under-identification would of course reduce the inter-State differences in ratios of Aboriginal and Torres Strait Islander to non-Indigenous use. However, it would not change the rates of growth. At face value, hospitalisation for Aboriginal and Torres Strait Islander people rose much more than for the non-Indigenous population, though not as rapidly in cost-weighted terms. But it is not immediately clear how much of the apparent change was 'real' and how much the result of better identification. If our 1995–96 assumption of complete enumeration in the Northern Territory and Western Australia was correct, their changes would stand but there are a number of possibilities in other States and Territories. The New South Wales submission, in particular, reported significant efforts to improve public hospital identification in recent years. If that succeeded, there may have been no increase in use at all (or even a decrease) in Aboriginal and Torres Strait Islander admitted patient usage in that State. It is therefore important to review our estimation of reporting accuracy in the light of any additional evidence over the last two years.

## **Application of under-identification estimates to the final results**

The final estimates of under-identification have taken into account the studies documented in Appendix 5 and other evidence, in deciding whether any changes in the previously determined proportions should be made. For each jurisdiction, the results were as follows:

### **New South Wales**

The New South Wales submission divided estimated under-identification into two parts, namely the 13% estimated from multiple admissions of Aboriginal and Torres Strait Islander people and an additional component (implicitly for initial identification) of between 15% and 25%. The New South Wales preferred figure was 20%. Taken together, the two factors would imply an expansion of about 36% in the reported number of unweighted separations, or about 27% under-identification. However, in cost-weighted terms, it was closer to 30% because under-identification appeared to be greater for the more expensive metropolitan admissions.

We have assumed a 30% under-identification. It implies some improvement in identification since 1995–96—about 3%—which is consistent with advice from the New South Wales Health Department.

### **Victoria**

There were no directly supporting data for the estimate of 25% under-identification in 1995–96. It was a judgment based on the reported usage rates relative to other States and Territories, the factors likely to influence them and some conformity with the more supported estimate for New South Wales. The figure was somewhat higher than the Victorian authorities then contemplated.

The additional information since then is from the Koori Health Unit survey (Appendix 5). This survey is likely to have somewhat overstated the errors in

reported usage figures; however, their direction may be valid. If the survey levels of under- and over-reporting were accepted the result would be:

- a net over-identification of about 15%, based on the recording of multiple admissions over time; and
- a possible under-identification of about 34% in initial identification, based on the proportion of mis-recorded 'definite' and 'probable' Aboriginal and Torres Strait Islander hospital admissions in the same study.

The net effect would be an increase of 28% in the reported figures, equivalent to under-identification of about 22%.

This is useful additional information. However, the uncertainties surrounding it are such that no change in the previous estimate of 25% net under-identification has been made. It is of the right order of magnitude and, with only 0.5% of its resident population identifying as Aboriginal, the usage data for Victoria may be so subject to recording error that any apparent differences may not be real. The same must apply to any reported changes since 1995–96, but since only 6% of all Aboriginal and Torres Strait Islander people live in the State it has little effect on any national figures.

### **Queensland**

The Queensland submission suggested under-identification of 32% (the same as submitted in 1995–96) based on some surveys of individual hospitals in recent years. However, these were largely from hospitals in the south-east corner, where the proportion of Aboriginal and Torres Strait Islander patients is low. Less information was available for more distant areas. Data from the Department's Epidemiological Unit show that in 1998–99 about 20% of all Aboriginal and Torres Strait Islander separations was for people living in Aboriginal communities or in remote areas with less than 5% of their population recorded as Aboriginal but where identification was believed to be complete. That is consistent with the ABS & AIHW (AHMAC, AIHW & ABS 1999) result where identification averaged around 94% in areas where a 'high' proportion of the population were Aboriginal and Torres Strait Islander, compared with only 66% where the proportion was low. About 35% of Queensland's Aboriginal and Torres Strait Islander population lives in the regions of Mount Isa, Cooktown, Cairns and the Torres Strait area. If the ABS results applied to them, the combined data suggest a State-wide identification of between 75% and 80% in 1998–99.

The 1995–96 estimate of under-identification in Queensland was 15%. That was almost certainly too low and we have increased it to 20% for the current calculations. The resulting estimates of utilisation are certainly high but the rates are broadly comparable with those in Western Australia and the Northern Territory.

### **Western Australia and the Northern Territory**

These were the 'gold standard' jurisdictions in the first report, in so far as their identification was assumed to be as complete as possible. The ABS & AIHW study (AHMAC, AIHW & ABS 1999) suggested that under-identification in three Northern

Territory hospitals might have been about 3% but that is still a very high level of accuracy.

There might have been some differences in the way same day admissions were defined. All of the States and Territories reported large increases in same day admission rates but growth in Western Australia was very rapid indeed—75% per person over three years was a 21% increase per person per year with only a modest reduction (1%) in overnight admission rates.

Western Australia has confirmed the high accuracy of its identification through a data-linking exercise which showed accuracy of Aboriginal identification of 94% in 1994–95 and 1995–96, and 95% in 1996–97. An under-identification factor of 6% has been applied in 1998–99 in line with this study.

### **South Australia**

The 10% under-identification estimate used in the 1995–96 survey has been retained. There is no new evidence, other than the ABS & AIHW study (AHMAC, AIHW & ABS 1999) in which nearly half of the sampled hospitals were South Australian and which suggested under-identification of about this magnitude.

### **Tasmania**

Recording errors in Tasmania are so large that no under-identification factor could be applied. Instead a survey of outpatient clinic usage was used to allocate admitted patient expenditure.

### **Australian Capital Territory**

The under-identification factor found for the two main Australian Capital Territory hospitals in the ABS & AIHW hospital identification study (AHMAC, AIHW & ABS 1999) was applied to the Australian Capital Territory data.

### **Application**

Table 4.3 shows overall separation rates per 1,000 population in 1998–99, before and after adjustment for estimated under-identification, and the ratios of Aboriginal and Torres Strait Islander to non-Indigenous hospital use derived from them. The data are not cost-weighted.

**Table 4.3: Separation rates for Aboriginal and Torres Strait Islander people and non-Indigenous people per 1,000 population, public acute-care institutions, by State, 1998–99**

Separation type	NSW	Vic	Qld	WA	SA	NT	Aust
<b>Reported</b>							
Indigenous	246	259	418	567	469	601	391
Other	199	208	198	181	233	165	201
<b>Est. under-identification (%)</b>	<b>30</b>	<b>25</b>	<b>20</b>	<b>6</b>	<b>10</b>	<b>—</b>	<b>16</b>
<b>Adjusted</b>							
Indigenous	352	346	522	603	521	600	463
Other	197	207	194	180	232	165	199
<b>Ratio: Indigenous/other</b>	<b>1.79</b>	<b>1.67</b>	<b>2.69</b>	<b>3.35</b>	<b>2.24</b>	<b>3.64</b>	<b>2.32</b>

(a) Australia includes estimates for Aboriginal and Torres Strait Islander patients in the Australian Capital Territory and Tasmania.

Note: The separations where Indigenous status was not reported have been allocated between 'Indigenous' and 'Other' in the proportion of the identified separations.

As in the 1995–96 report, adjustment for under-identification narrows the inter-State differences but only marginally alters the relative position of New South Wales and Victoria.

Table 4.4 shows the change in hospital separations between 1995–96 and 1998–99 with the numbers in all years adjusted for under-identification. There is a higher rate of increase for Aboriginal and Torres Strait Islander separations than for non-Indigenous separations for all States and Territories. Particularly significant is the increase of almost 30% in Aboriginal and Torres Strait Islander separations in Queensland, Western Australia and the Northern Territory.

Note: The 30% increase for Queensland assumes an under-identification factor in 1995–96 of 20%, not the factor of 15% assumed in the 1995–96 report. If the 1995–96 factor had been used, the increase in Aboriginal and Torres Strait Islander separations would have been 37%—from 42,466 to 58,343.

**Table 4.4: Separations for Aboriginal and Torres Strait Islander people and non-Indigenous people, adjusted for under-identification, public acute-care institutions, by State, 1995–96 and 1998–99**

	NSW	Vic	Qld	WA	SA	NT	Aust <sup>(a)</sup>
<b>Aboriginal and Torres Strait Islander people</b>							
1995–96	37,419	7,099	45,121	26,758	10,360	25,257	154,562
1998–99	40,663	8,155	58,343	35,501	12,074	32,509	188,031
% change	8.7	14.9	29.3	29.3	16.5	28.7	21.7
<b>Non-Indigenous people</b>							
1995–96	1,203,525	859,772	586,867	305,988	309,077	20,752	3,412,244
1998–99	1,222,498	960,838	648,884	318,940	340,051	22,376	3,651,384
% change	1.6	11.8	10.6	4.2	10.0	7.8	7.0

(a) Australia includes derived estimates for Aboriginal and Torres Strait Islander patients in the Australian Capital Territory and Tasmania.

## Summary

Nationally, the estimated under-identification factor for 1998–99 has hardly changed from that for 1995–96. The rate for New South Wales has fallen by about 3% but the original estimate for Queensland was almost certainly too low and it has been increased by 5%. A Western Australian under-identification factor of 6% has been applied in 1998–99, whereas no factor was applied in 1995–96. None of the other State under-identification estimates have been changed; however, they are all approximations only and the additional information obtained since 1996, summarised in Appendix 5, has confirmed some aspects and thrown doubt on others. The ABS & AIHW survey (AHMAC, AIHW & ABS 1999) has established a reliable methodology for assessing accuracy and confirmed earlier estimates for the Northern Territory and South Australia. This information has been used, together with the broad assumptions we made in relation to likely identification levels in areas where the proportion of Aboriginal and Torres Strait Islander people in the population varied markedly.

The survey implied a level of recording accuracy which the Victorian and New South Wales studies suggested could not be assumed in the larger States where Aboriginal and Torres Strait Islander patients are relatively rare and both under-reporting and over-reporting are possible. The general assumption of automatic under-identification in the reported figures could therefore be wrong. At this point of time the estimated under-identification factors are as good as can be devised. However, sufficient uncertainty surrounds them to make interpretation of all but the largest changes of hospital use over time extremely hazardous.

## Overview of hospital costing

There are a number of factors driving differences in admitted patient expenditures between Aboriginal and Torres Strait Islander people and non-Indigenous people. The high hospital admission rate of Aboriginal and Torres Strait Islander people is well documented. Studies outlined in Appendix 5 and discussed earlier in this chapter provide evidence that Aboriginal and Torres Strait Islander people are under-identified in hospital separations. The average diagnosis-related group (DRG) cost weight of Aboriginal and Torres Strait Islander patients is lower due to higher numbers of low-cost DRGs such as dialysis and lower numbers of high-cost surgical DRGs. There is also evidence to suggest that, within DRGs, Aboriginal and Torres Strait Islander patients have higher costs per episode due to more complications, which lead to longer lengths of stay. It is also probable that Aboriginal and Torres Strait Islander patients have higher costs per day due to more additional diagnoses.

The geographic distribution of Aboriginal and Torres Strait Islander people means that the cost structure of the hospitals used by them is different from the cost structure of the hospitals used by non-Indigenous people. Aboriginal and Torres Strait Islander people are more likely to use remote high-cost hospitals than non-Indigenous people. They are also more likely to use some lower-cost hospitals such as small non-remote rural hospitals and remote Queensland hospitals.



## Utilisation and cost weights

Aboriginal and Torres Strait Islander people use more hospital separations per head of population than non-Indigenous people do, with the differential varying between jurisdictions. (See Table 6.7 of *Australian Hospital Statistics 1998–99* (AIHW 2000a) and Table 4.2 in this chapter.)

The average cost weight of these separations is lower for Aboriginal and Torres Strait Islander people. This overall pattern is fairly consistent across Australia (Table 4.5). However, South Australia shows a higher average cost weight (0.97) for Aboriginal and Torres Strait Islander people than other States. This is due to a number of Northern Territory patients with high cost weights being treated in South Australian public hospitals. South Australian Aboriginal and Torres Strait Islander patients treated in South Australia have a cost weight of 0.83. In contrast, the Northern Territory patients comprise 18% of the cost-weighted separations in South Australian public hospitals and have an average cost weight of 2.7. (We have used the national public cost weights in this table to give a consistent measure across jurisdictions and sectors.)

**Table 4.5: Average national public hospital cost weight, acute separations by sector and jurisdiction, 1998–99**

Sector	Aboriginality	NSW	Vic	Qld	WA	SA	NT	Aust <sup>(a)</sup>
Private	Indigenous	0.72	0.91	0.70	0.59	0.88	..	0.73
	Non-Indigenous	0.89	0.93	0.93	0.89	0.98	..	0.92
	<i>Total</i>	<i>0.88</i>	<i>0.93</i>	<i>0.92</i>	<i>0.89</i>	<i>0.98</i>	<i>..</i>	<i>0.91</i>
Public	Indigenous	0.84	0.89	0.83	0.83	0.97	0.70	0.82
	Non-Indigenous	1.03	1.00	0.99	0.97	1.00	0.90	1.00
	<i>Total</i>	<i>1.03</i>	<i>1.00</i>	<i>0.98</i>	<i>0.96</i>	<i>1.00</i>	<i>0.78</i>	<i>1.00</i>
Total	Indigenous	0.83	0.89	0.83	0.82	0.97	0.70	0.82
	Non-Indigenous	0.99	0.98	0.97	0.94	0.99	0.90	0.98
	<b>Total</b>	<b>0.98</b>	<b>0.97</b>	<b>0.96</b>	<b>0.93</b>	<b>0.99</b>	<b>0.78</b>	<b>0.97</b>

(a) Australia includes the Australian Capital Territory and Tasmania.

Source: Hospital morbidity database.

## Average length of stay and complexity

At the total level, the average length of hospital stay for Aboriginal and Torres Strait Islander people is longer than for non-Indigenous people within the same DRGs. This leads to the cost per casemix-adjusted separation estimate for Aboriginal and Torres Strait Islander people being higher when using the Institute's length of stay adjustment (Appendix 5). There are a number of factors behind these differences including hospital/regional variations and levels of complexity.

The variation in the average length of stay by Australian Refined-DRG (ARDRG) may also be due to structural and other factors. For example, in Table 4.6 the average length of stay for DRG O60D *Normal vaginal delivery* shows variation in average length of stay between jurisdictions and between Aboriginal and Torres Strait

Islander and non-Indigenous people within jurisdictions. Part of the reasons for these variations may include differences in clinical practice and post discharge support structures, in particular the availability of home midwifery and mothercraft hospitals.

**Table 4.6: Average length of stay for AR-DRG O60D Normal vaginal delivery for public hospitals by jurisdiction, 1998–99**

	NSW	Vic	Qld	WA	SA	NT	Aust
Indigenous	3.0	2.8	2.8	3.2	2.5	4.4	3.1
Non-Indigenous	3.1	3.2	2.7	3.2	3.1	3.4	3.1
Difference	-0.1	-0.4	0.1	0.0	-0.6	1.0	0.0

## Regional differences

To understand the variations introduced by the differences between hospitals it is useful to relate the Aboriginal and Torres Strait Islander population distribution to the peer group information in Appendix Table A11.2 of *Australian Hospital Statistics 1998–99* (AIHW 2000a). A high proportion of Aboriginal and Torres Strait Islander people live in areas where the hospitals are relatively high-cost, such as the Northern Territory and other remote parts of Australia. However, there are counteracting factors. Some other parts of Australia, where there are high proportions of Aboriginal and Torres Strait Islander people, have hospitals which are lower-cost than the rest of Australia, with the most extreme example being the remote hospitals in Queensland. These hospitals report very low costs per separation. This may be due to a number of factors such as the patients being more like overnight outpatients rather than ordinary hospital admitted patients.

Rural hospitals in particular treat higher numbers of Aboriginal and Torres Strait Islander patients. In New South Wales and Queensland, these hospitals have a lower average cost per casemix-adjusted separation than most of the metropolitan hospitals, particularly the teaching hospitals.

## The combined effect on the jurisdictions

Applying a length of stay adjustment to the cost estimates has minimal effect in New South Wales, Victoria, Queensland and Western Australia (columns 4 and 7 of Table 4.7). It increases the relative size of the cost per casemix-adjusted separation for South Australia and the Northern Territory.

Scaling the expenditure by the total admitted patient expenditure within the hospitals in the State has a somewhat different effect (columns 5 and 8 of Table 4.7). This occurs because hospitals treating higher proportions of Aboriginal and Torres Strait Islander persons are less expensive in New South Wales and Queensland. In Western Australia, the reverse is true, with hospitals treating higher proportions of Aboriginal and Torres Strait Islander persons being more expensive than the average.

**Table 4.7: Relative State-based weight adjustment of cost per casemix-adjusted separation for public hospitals 1998–99**

State	Indigenous status	Cost per casemix-adjusted separation (using State-based weights) (\$)			Costs relative to State total		
		DRG weight only estimate	DRG weights with length of stay adjustment	Scaling to the hospital expenditure	DRG weight only estimate	DRG weights with length of stay adjustment	Scaling to the hospital expenditure
NSW	Indigenous	2,517	2,562	2,571	1.00	0.99	0.96
	Non-Indigenous	2,519	2,584	2,688	1.00	1.00	1.00
	Total	2,519	2,584	2,686	1.00	1.00	1.00
Vic	Indigenous	2,317	2,279	2,309	1.00	0.98	0.98
	Non-Indigenous	2,319	2,329	2,345	1.00	1.00	1.00
	Total	2,319	2,329	2,345	1.00	1.00	1.00
Qld	Indigenous	2,275	2,302	2,192	1.00	1.01	0.94
	Non-Indigenous	2,282	2,288	2,341	1.00	1.00	1.00
	Total	2,281	2,287	2,335	1.00	1.00	1.00
WA	Indigenous	2,415	2,389	2,867	1.00	0.98	1.05
	Non-Indigenous	2,416	2,436	2,725	1.00	1.00	1.00
	Total	2,416	2,432	2,736	1.00	1.00	1.00
SA	Indigenous	2,266	2,453	2,637	1.00	1.09	1.13
	Non-Indigenous	2,262	2,250	2,329	1.00	1.00	1.00
	Total	2,262	2,254	2,337	1.00	1.00	1.00
NT	Indigenous	2,404	2,901	3,454	1.00	1.06	1.06
	Non-Indigenous	2,410	2,556	3,062	1.00	0.93	0.94
	Total	2,407	2,737	3,268	1.00	1.00	1.00
Australia	<b>Indigenous</b>	<b>2,375</b>	<b>2,484</b>	<b>2,676</b>	<b>0.99</b>	<b>1.03</b>	<b>1.06</b>
	<b>Non-Indigenous</b>	<b>2,389</b>	<b>2,419</b>	<b>2,515</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>
	<b>Total</b>	<b>2,387</b>	<b>2,419</b>	<b>2,516</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>

*Notes*

1. All results from the AIHW hospital morbidity costing model.
2. Australia includes estimates for the Australian Capital Territory and Tasmania.

The Australian effect can be seen as a combination of differences between the jurisdictions. The higher costs for all patients in Western Australia and the Northern Territory, combined with high proportions of the total Aboriginal and Torres Strait Islander population, increase the differentials across Australia between Aboriginal and Torres Strait Islander patients and non-Indigenous patients. Overall costs per separation within DRGs for Aboriginal and Torres Strait Islander patients are 6% higher than for non-Indigenous patients. But New South Wales costs per separation for Aboriginal and Torres Strait Islander patients are 4% lower and Queensland costs are 6% lower, whereas Western Australia, South Australia and Northern Territory costs per separation for Aboriginal and Torres Strait Islander patients are respectively 5%, 13% and 6% higher.

## Higher cost intensity per bed day

Health workers have long argued that there are higher costs involved in treating Aboriginal and Torres Strait Islander people in the same DRG because of greater comorbidities. Several State health authorities pay extra per casemix-weighted Indigenous separation to hospitals to allow for these claimed extra costs. However, there has been a lack of solid evidence supporting this proposition.

The National Aboriginal and Torres Strait Islander Casemix Study (Brewerton & Associates 1997) measured costs of Aboriginal and Torres Strait Islander and non-Indigenous patients in 10 hospitals in Northern Territory, Western Australia, northern Queensland and South Australia. It showed, after adjustment for casemix, a 5% higher cost for Aboriginal and Torres Strait Islander patients but this difference was not statistically significant.

Recently, modelling work using data from the New South Wales Trendstar hospitals has shown that, after adjustment for casemix, Aboriginal and Torres Strait Islander patients cost 9.4–9.5% more per separation. Of that higher cost, 2.4 to 2.6% was shown to be due to longer length of stay. The hospitals in the study are mostly larger hospitals and mostly metropolitan, so do not represent the costs of many of the smaller rural and base hospitals in New South Wales. However, it is a solid study which supports the anecdotal evidence that has come from various health workers. Therefore it seemed reasonable to make some adjustment for higher cost intensity for Aboriginal and Torres Strait Islander patients. The Institute hospital morbidity cost model already makes allowance for the higher costs that arise for Aboriginal and Torres Strait Islander patients due to longer length of stay. The New South Wales study shows there is a higher cost, not related to length of stay, of  $1.094/1.025 = 1.07$ , i.e. a 7% higher cost intensity per bed day.

It was decided, therefore, to apply a 5% cost loading to Aboriginal and Torres Strait Islander separations. This adds \$18 million to the admitted patient expenditure estimates.

## Summary

This chapter has used more detailed State morbidity data than the first report in making admitted patient expenditure estimates. This has changed the cost relativities for the different States. For example, this report allows for the impact of the relatively lower-cost New South Wales and Queensland hospitals which treat many Aboriginal and Torres Strait Islander patients, and allows for the higher costs for South Australia because many Aboriginal and Torres Strait Islander patients are treated many hundreds of kilometres from home and many of the high-cost Northern Territory patients are treated in South Australian hospitals. Consequently the rate of growth of public hospital expenditure for Aboriginal and Torres Strait Islander patients from 1995–96 to 1998–99 varies from State to State. In some cases the variation was due to difference in the growth of patients treated, in other cases due to the change in the costing methodology.

The most significant change in methodology is an allowance of 5% for greater costs for Aboriginal and Torres Strait Islander patients due to greater cost intensity per day. This adds \$18 million, and brings the admitted patient expenditure estimates up to \$453 million.

These admitted patient expenditures are estimates based on modelling techniques, rather than patient costing data. When more hospitals supply patient costing data, the estimates for admitted patient expenditure will be improved.