

Appendix 1: Technical notes

Technical notes on tables in this report

If not otherwise indicated, data elements were defined according to the 1996–97 definitions in the *National Health Data Dictionary* (NHDC 1996) (summarised in the Glossary).

Unless otherwise specified,

- the Department of Veterans' Affairs hospital in New South Wales and the public psychiatric hospitals are included in the public hospital (public sector) category; and
- private free-standing day hospital facilities are included in the private hospital (private sector) category.

Data presented by State or Territory refer to the State or Territory of the hospital, not to the State or Territory of the usual residence of the patient. The exceptions are Tables 5.8, 5.9 and 5.10, in which the State or Territory of usual residence of the patient is reported against the State or Territory of hospitalisation. Data presented in Table 8.1 are also presented by State or Territory of usual residence.

Except as noted, where totals are provided in the tables, they include data only for those States and Territories for which data were available, as indicated in the tables. The exceptions include some tables for private hospitals in Chapters 7, 8 and 10 in which data are not published for Tasmania and the Australian Capital Territory. Although available, these data were not published, for confidentiality reasons.

Throughout the publication, percentages may not add up to 100.0 due to rounding. Percentages printed as 0.0 may denote less than 0.05%.

Patient days

Patient days provide information on the length of stay of patients and are defined in the *National Health Data Dictionary* (NHDC 1996) as 'the total number of days or part days of stay for all patients who were admitted for an episode of care and who underwent separation during the reporting period'. For overnight stay patients, the day that the patient is admitted is counted as a patient day, while the day that the patient is separated is not counted as a patient day. Same day patients are allocated a length of stay of one day.

This definition means that not all patient days reported will have occurred in the reporting period (that is, 1 July 1996 to 30 June 1997) and, therefore, cannot be used to calculate accurate occupancy rates. It is expected, however, that in acute hospitals, patient days for patients who separated in 1996–97, but were admitted in 1995–96 would be counterbalanced by the patient days for patients in hospital on 30 June 1997 who will separate in the following reporting period, and for whom data will be reported in the data collection for the 1996–97. Because of the more variable lengths of stay in long-stay establishments (such as public psychiatric hospitals), the numbers of separations and patient days can be a less accurate measure of the activity of these establishments.

Discrepancies in reporting of separations and patient days

The scope of the National Hospital Morbidity and the National Public Hospital Establishments Databases are described in Chapter 1. Both databases report separations and patient days. These data are collected at the patient level for the National Hospital Morbidity Database and at an aggregate level for individual hospitals for the National Public Hospital Establishments Database. However, even after excluding separations and patient days from private hospitals from the National Hospital Morbidity Database, there are discrepancies between the two databases in the reporting of these variables. This is borne out by comparing Table 4.2 with Tables 4.3 and 4.4.

A variety of factors have been found to contribute to these differences. New South Wales has reported that a number of the public hospitals reported to the National Public Hospital Establishments Database have attached nursing homes. These nursing homes are separately identified and have not been reported to the National Hospital Morbidity Database, as nursing homes are not included in its scope. However, in the National Public Hospital Establishments Database, the separations and patient days are reported with the 'parent' hospital because the expenditure and staffing of these units cannot be separated from that of the 'parent' hospital.

In Queensland, discrepancies between the Databases have occurred primarily in the recording of patient days as a result of a computer system limitation. Specifically, patient days are recorded by the computer system when an episode of care record is entered on the database. However, the maximum number of patient days recorded is 9,999. In 1996–97, eight patients had 9,999 patient days recorded. At least five of these actually had lengths of stay that were well in excess of 9,999 days. Therefore, the number of patient days reported to the National Public Hospital Establishments Database was underestimated and, for Queensland, data provided to the National Hospital Morbidity Database should be accepted as more accurate. This problem will be overcome with the 1997–98 collection.

Other States and Territories have not been able to explain the differences, although potential problems with the recording and reporting of leave days may explain much of the discrepancies between data (particularly patient days) reported to the two databases. Patients who do not require treatment over a weekend or other short period may leave the hospital temporarily with the approval of the hospital or treating medical practitioners. Where there is a decision that the patient will return to the same hospital within a short time to resume treatment, this absence is defined as leave. The admitted patient is separated if leave exceeds seven days.

Data provided to the National Public Hospital Establishments Database and the National Hospital Morbidity Database should exclude leave days. In the past, however, a number of States have reported some problems in reporting patient leave days (and therefore accurately reporting patient days). In some cases, this has just occurred for some types of hospitals (for example, public psychiatric hospitals).

Population rates

Crude population rates and age group specific rates in Chapters 4 and 6 were calculated using Australian Bureau of Statistics' population estimates for 31 December 1996 (Appendix 2). For Figure 6.7, estimates for the Indigenous population for 30 June 1996 were used for age group specific rates for the Indigenous population.

Age-standardised rates were calculated using the direct standardisation method and 5 year age groups. The total Australian population for 30 June 1991 was used as the population for

which expected rates were calculated. For the observed rates, the population estimates for 31 December 1996 were used for Tables 4.1, 4.2 and 8.1. For Tables 6.5 and 6.6, the observed rates were calculated using population estimates for the Indigenous population and for the population for selected countries of birth for 30 June 1996, respectively (Appendix 2). Rates in Table 8.1 were standardised by sex as well as by age.

Appendix 2: Population estimates

Table A1: Estimated resident population by age group and sex, States and Territories, 31 December 1996

Sex	Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia ^(a)
Females	0	42,505	29,704	22,854	12,086	9,293	3,127	2,180	1,761	123,535
	1-4	171,810	123,604	95,078	49,474	38,095	13,284	8,651	6,946	507,070
	5-14	427,408	309,178	241,319	130,041	98,003	34,978	22,122	15,327	1,278,703
	15-24	433,119	323,608	248,955	129,309	98,585	32,419	26,318	14,932	1,307,392
	25-34	483,987	365,595	261,519	139,446	109,229	34,153	26,051	17,735	1,438,027
	35-44	478,545	353,839	257,373	141,426	113,602	36,868	25,539	14,409	1,421,873
	45-54	389,619	288,899	211,904	110,404	95,678	29,832	21,229	9,604	1,157,303
	55-64	268,994	198,282	134,725	70,376	65,792	20,943	10,561	4,000	773,726
	65-74	243,001	176,653	113,833	56,343	62,763	18,380	7,489	1,883	680,366
	75 and over	203,662	149,434	94,805	46,945	55,156	16,001	5,350	1,011	572,380
	Total	3,142,650	2,318,796	1,682,365	885,850	746,196	239,985	155,490	87,608	9,260,375
Males	0	45,025	31,295	24,201	12,843	9,781	3,339	2,197	1,868	130,579
	1-4	180,712	130,174	100,674	52,366	40,137	14,112	8,928	7,375	534,599
	5-14	448,066	323,833	254,621	137,188	103,446	36,394	23,063	16,505	1,343,448
	15-24	448,727	334,851	259,116	136,526	103,106	33,378	26,996	16,512	1,359,432
	25-34	483,204	359,228	262,208	142,841	111,141	33,048	25,588	19,029	1,436,618
	35-44	478,367	348,710	257,106	142,039	112,568	36,196	24,287	15,988	1,415,554
	45-54	401,632	289,789	221,620	117,614	95,616	30,427	21,217	11,824	1,189,974
	55-64	270,796	197,180	141,042	72,579	64,602	20,786	10,874	5,445	783,389
	65-74	217,329	156,732	106,380	52,751	55,998	16,592	6,628	2,297	614,728
	75 and over	124,365	90,663	62,114	29,335	33,611	9,815	3,246	833	353,999
	Total	3,098,223	2,262,455	1,689,082	896,082	730,006	234,087	153,024	97,676	9,162,320
Persons	0	87,530	60,999	47,055	24,929	19,074	6,466	4,377	3,629	254,114
	1-4	352,522	253,778	195,752	101,840	78,232	27,396	17,579	14,321	1,041,669
	5-14	875,474	633,011	495,940	267,229	201,449	71,372	45,185	31,832	2,622,151
	15-24	881,846	658,459	508,071	265,835	201,691	65,797	53,314	31,444	2,666,824
	25-34	967,191	724,823	523,727	282,287	220,370	67,201	51,639	36,764	2,874,645
	35-44	956,912	702,549	514,479	283,465	226,170	73,064	49,826	30,397	2,837,427
	45-54	791,251	578,688	433,524	228,018	191,294	60,259	42,446	21,428	2,347,277
	55-64	539,790	395,462	275,767	142,955	130,394	41,729	21,435	9,445	1,557,115
	65-74	460,330	333,385	220,213	109,094	118,761	34,972	14,117	4,180	1,295,094
	75 and over	328,027	240,097	156,919	76,280	88,767	25,816	8,596	1,844	926,379
	Total	6,240,873	4,581,251	3,371,447	1,781,932	1,476,202	474,072	308,514	185,284	18,422,695

(a) Includes Other Territories.

Source: Australian Bureau of Statistics unpublished data.

Table A2: Estimated resident Aboriginal and Torres Strait Islander population by age group and sex, States and Territories, 30 June 1996

Sex	Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia ^(a)
Females	0	1,691	332	1,608	774	313	215	42	682	5,658
	1-4	6,482	1,269	6,130	2,956	1,203	799	157	2,655	21,660
	5-14	13,765	2,713	13,173	7,292	2,799	2,012	388	6,186	48,347
	15-24	10,218	2,089	10,299	5,368	2,140	1,553	341	5,437	37,461
	25-34	9,233	1,947	8,808	4,936	1,995	1,178	289	4,445	32,845
	35-44	6,685	1,409	6,153	3,336	1,315	993	196	2,998	23,099
	45-54	3,968	812	3,640	1,820	730	511	91	1,780	13,363
	55-64	2,191	454	1,926	1,029	410	252	17	1,083	7,364
	65-74	1,084	277	1,044	603	207	129	11	506	3,863
	75 and over	505	147	511	297	129	60	4	268	1,921
	Total	55,822	11,449	53,292	28,411	11,241	7,702	1,536	26,040	195,581
Males	0	1,720	346	1,642	811	321	227	50	738	5,857
	1-4	6,595	1,309	6,269	3,108	1,221	832	191	2,873	22,406
	5-14	14,498	2,766	13,738	7,452	2,835	2,133	380	6,635	50,461
	15-24	10,243	2,040	10,165	5,411	2,033	1,456	319	5,495	37,190
	25-34	8,097	1,804	7,982	4,543	1,840	1,097	258	4,218	29,855
	35-44	5,973	1,353	5,569	3,108	1,275	925	203	2,761	21,181
	45-54	3,850	837	3,279	1,722	702	579	88	1,630	12,695
	55-64	2,015	399	1,671	912	334	252	25	874	6,489
	65-74	818	202	824	485	165	88	6	395	2,983
	75 and over	294	93	386	242	84	31	2	217	1,351
	Total	54,103	11,149	51,525	27,794	10,810	7,620	1,522	25,836	190,468
Persons	0	3,411	678	3,250	1,585	634	442	92	1,420	11,515
	1-4	13,077	2,578	12,399	6,064	2,424	1,631	348	5,528	44,066
	5-14	28,263	5,479	26,911	14,744	5,634	4,145	768	12,821	98,808
	15-24	20,461	4,129	20,464	10,779	4,173	3,009	660	10,932	74,651
	25-34	17,330	3,751	16,790	9,479	3,835	2,275	547	8,663	62,700
	35-44	12,658	2,762	11,722	6,444	2,590	1,918	399	5,759	44,280
	45-54	7,818	1,649	6,919	3,542	1,432	1,090	179	3,410	26,058
	55-64	4,206	853	3,597	1,941	744	504	42	1,957	13,853
	65-74	1,902	479	1,868	1,088	372	217	17	901	6,846
	75 and over	799	240	897	539	213	91	6	485	3,272
	Total	109,925	22,598	104,817	56,205	22,051	15,322	3,058	51,876	386,049

(a) Includes Other Territories.

Source: Australian Bureau of Statistics 1996.

Table A3: Estimated resident population by country/region of birth, 30 June 1996

Country/region of birth	Population	Country/region of birth	Population
Australia	14,052,061	Myanmar	11,272
New Zealand	315,054	Indonesia	47,736
Papua New Guinea	26,375	Cambodia	23,851
Fiji	40,487	Malaysia & Brunei	85,021
Oceania (other)	27,990	Philippines	102,675
Oceania (total)	14,461,967	Singapore	31,393
		Vietnam	164,164
United Kingdom & Northern Ire&	1,220,013	Thailand	20,620
Greece	141,750	China	121,145
Italy	259,125	Hong Kong & Macau	79,224
Malta	55,628	Japan	25,656
Former Yugoslavia	193,775	Korea	32,628
Former USSR & Baltic States	54,116	India	84,770
Hungary	27,249	Sri Lanka	51,960
Poland	70,891	Asia (other)	55,390
Romania	13,294	Asia (total)	937,505
Austria	22,664		
France	17,037	Canada	27,426
Germany	120,753	United States of America	54,296
Netherlands	95,339	North America (other)	409
Europe & the former USSR (other)	124,290	North America (total)	82,131
Europe & the former USSR (total)	2,415,924		
		Argentina	11,752
Lebanon	77,293	Chile	26,217
Turkey	31,904	The Caribbean	3,843
Iran	33,545	Central & South America (other)	41,146
Egypt	37,639	South America, Central America &	
Middle East & North Africa (other)	31,473	The Caribbean (total)	82,958
Middle East & North Africa (total)	211,854		
		Mauritius	18,833
		South Africa	61,371
		Africa excluding North Africa (other)	38,171
		Africa excluding North Africa (total)	118,375
		Overseas (total)	4,258,653
		Total	18,310,714

Source: Australian Bureau of Statistics 1998.

Appendix 3: Cost per casemix-adjusted separation methodology

The methodology used to calculate the cost per casemix-adjusted separation for the current report replicates the method used to report this indicator in previous years (National Health Ministers Benchmarking Working Group (NHMBWG) 1996, Steering Committee for the Review of Commonwealth/State Service Provision (SCRCSSP) 1997 and NHMBWG 1998 (in print). The indicator is calculated as:

$$\frac{\text{Recurrent expenditure} \times \text{IFRAC}}{\text{Total separations} \times \text{Average case weight}}$$

where IFRAC (inpatient fraction) is the estimated proportion of total hospital costs related to admitted patients and average cost weight is a single number representing the relative costliness of cases for a particular provider (or a group of providers, for example teaching hospitals). Calculation of the average cost weight concept is described below.

Recurrent expenditure for this indicator is defined by NHDD items E8–E18 and E20.

Total separations are defined by NHDD item A1. In short, a separation is counted when a patient completes an episode of hospital care, whereas an admission is counted when a patient commences an episode of care.

As there is inconsistency between States in the recording of depreciation, it has been excluded from this analysis. It is anticipated that as accrual accounting becomes universally adopted by health authorities, comparable data on depreciation will become available and it will be included in analyses such as this.

Scope

In general the scope of the Establishment data collection is limited to public hospitals providing services under the Medicare agreements. For the purposes of improving the comparability of data across jurisdictions and increasing the accuracy of the analysis, the scope for this table has been restricted to selected public acute hospitals. As can be seen from the table, the number of separations excluded from the analysis is only 2.5% of the total number of separations for the nation. Hospitals excluded from the analysis include psychiatric, rehabilitation, dental, mothercraft, day surgery and some small rural hospitals.

There have been changes made to which hospitals were included in the analyses. In particular the introduction of networks and multi campus operations in some States has caused the inclusion of some data that was previously excluded from the analyses done by NHMBWG and for SCRCSSP. This was unavoidable as no financial data was available below the network level.

Determining costs for admitted patients

Ideally, costs for acute admitted patients only would be used for this indicator. There are two dimensions to this scope: *admitted* patients and *acute* admitted patients.

On the first dimension, it is necessary to exclude costs not directly associated with admitted patient care, notably non-inpatient (outpatient) costs. To determine the costs associated with admitted patients, an inpatient fraction (IFRAC) is used. The IFRAC is an expression of the ratio of inpatient costs to total hospital costs. The IFRAC is generally estimated at a hospital level from the results of surveys.

$$\text{IFRAC} = \frac{\text{Inpatient cost}}{\text{Total cost}}$$

For hospitals where the IFRAC was not available or clearly inconsistent with the data, the inpatient costs are estimated by Health and Allied Services Advisory Council (HASAC) ratio (see Cooper-Stanbury, Solon & Cook 1994. The HASAC IFRAC is worked out using the following formula:

$$\text{IFRAC}_H = \frac{\text{PDs}}{\text{PDs} + \left(\frac{\text{NIOOS}}{\text{Ratio}} \right)}$$

Where NIOOS = Non-Inpatient Occasions Of Service

PDs = Patient Days

IFRAC_H = the IFRAC calculated and

Ratio = the ratio of non-admitted patient cost to admitted patient cost per service

The ratio used in this report equates the cost of 5.753 non-admitted patient services to the cost of one admitted patient bed day.

Unbundling teaching and research costs from the total costs are not directly covered by this equation. The component of costs that relate to teaching are not directly estimated by this HASAC calculation. In effect they would be allocated to inpatients and outpatients according to the proportion calculated by the HASAC IFRAC. For the most part research costs are omitted from the scope of the collection as they are most frequently controlled by institutions legally (if not physically) separated from the hospital.

A brief analysis of hospitals where IFRACs were supplied shows that the ratio of non-admitted patient cost to admitted patient cost per service varies considerably between hospitals and jurisdictions. There are two explanations for this, either the casemix is different between the hospitals or the occasions of service are not being counted consistently across hospitals or across jurisdictions. For example, a hospital that performed outpatient pathology for a number of other hospitals may have a very different ratio of admitted patient cost to non-admitted patient costs from a hospital that performed many outpatient magnetic resonance imaging scans.

The HASAC method is used in this report to estimate IFRACs for one hospital in New South Wales, 14 in Queensland, 9 in South Australia and all hospitals in the Northern Territory and in the Australian Capital Territory. In New South Wales, Queensland and South Australia the HASAC IFRAC was usually only used on small rural hospitals. It also seems apparent from inspection of the data that some hospitals may use the HASAC method to estimate their IFRAC for reporting purposes.

Ideally, different IFRACs would be used for different cost categories. In the absence of comprehensive sets of IFRACs, a single hospital-wide IFRAC was applied to all cost

categories. In the case of visiting medical officer (VMO) payments (a component of medical costs), there has been much discussion about the appropriate IFRAC to apply. In earlier versions of this table, the IFRAC has both been applied to VMO payments (NHMBWG 1996, SCRCSSP 1997) and assumed to be 100% for VMO payments, as it was assumed that all VMO services related to admitted patients only (NHMBWG 1998). It was noted that this assumption may not hold for all jurisdictions, as VMOs may run outpatient clinics. On liaising with the States it was decided by all States individually that by applying the IFRAC to the VMO expenditure the best reflection of hospital practice in their State would be achieved.

Patients other than acute patients

It was not possible to isolate the costs of acute admitted patients from all admitted patient costs. Because costs are being estimated per separation and not per bed day most of the non-acute admitted patients (including rehabilitation and long-stay nursing home type patients) will have higher costs per separation, as these patients typically have longer lengths of stay, even though their daily costs are lower. These patients make up less than 5% of total admitted patient episodes and account for approximately 5% of total recurrent expenditure. Many of these records were excluded from the analysis by the restrictions in scope.

There is also variation in the application of the episode of care and type of episode of care between States. Some jurisdictions do not identify sub-acute occasions of service (see table 5.11). This is also shown in the application of statistical discharges and rates of transfers (see table 5.13). See NHDD item *P21 Type of episode of care* for more detail. In States where there is a clear delineation in funding arrangements between acute and sub-acute services, the split between acute and other types of patients will probably be different from where this is done purely on a statistical basis.

Unqualified neonates have traditionally been costed as a component of the mother's cost weight. The cost weight of the mother reflects the costs of the mother and the unqualified neonate. As a result, the inclusion of unqualified neonates in the count of casemix-adjusted separations would double count the combined cost weight of the mother and baby combination.

The NHMBWG determined at its last meeting that the ideal method for analysing the cost data would be to count unqualified neonates separately from their mothers, with their own cost weight. Given the cost weights for deliveries are not large, it is likely that if the cost weight for unqualified neonates is separated from the cost weight of the mother, they would be very low. It was argued that unqualified neonates are valid occasions of service and their costs should be reflected by the analysis in as accurate a manner as possible. Unfortunately there is no fully developed methodology for including unqualified neonates separately from their mothers, given that separate cost weights for unqualified neonates are not available.

If the neonates were included in the total separations line in the cost per casemix-adjusted separation calculation, the total average cost would decrease in all States by the following amounts:

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Decrease if unqualified neonates included (\$)	121	96	112	110	90	118	140	95	108
Decrease %	4.7	4.1	4.7	4.0	3.9	4.4	3.8	3.0	4.3

While the number of live births registered is collected on a different basis from hospital statistics, it serves as a useful basis for comparison of how neonatal data is being handled in each State. In 1995, 97.7% of births were in hospitals, 0.3% of births were immediately prior to admission to a hospital, 1.6% of births were in birthing centres (usually attached to hospitals) and only 0.3% of births were home births (Day et al 1997).

Comparison of hospital based neonatal data with registered births, all hospitals, States and Territories, 1996-97

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Live births registered ^(p)	86,519	62,123	46,895	24,840	18,945	6,204	4,802	3,627	253,995
MDC15 or age < 35 days including unqualified neonates	93,991	54,886	53,805	25,959	18,485	6,629	5,250	2,535	261,540
Ratio to births	1.09	0.88	1.15	1.05	0.98	1.07	1.09	0.70	1.03
MDC 15 or age<35 days Qualified neonates only	22,001	16,617	12,600	5,454	5,172	2,088	3,047	1,067	68,046
Ratio to births	0.25	0.27	0.27	0.22	0.27	0.34	0.63	0.29	0.27
Birthdate = admission date	86,532	47,855	45,904	23,648	14,427	5,807	4,888	2,107	231,168
Ratio to births	1.00	0.77	0.98	0.95	0.76	0.94	1.02	0.58	0.91

(p) preliminary ABS 3101.0

As can be seen from the above table, some States have a higher ratio of separation to registered births than other States. This is due to differences in the way neonatal separations are counted with respect to qualification. See NHDD item *P21 Type of episode of care* for more detail. There are also other recording differences between the States. In particular Victoria and South Australia supply very little private hospital data for unqualified neonates and the Northern Territory does not supply private hospital data (see table 5.11).

For qualified neonates, the ratio of separations to registered births is also higher in some States than in others. There are only three States that are more than 10% different from the national average in the ratio of qualified neonates to registered births.

There are other problems with the consistency of data being collected for unqualified neonates across Australia. For example the Patient accommodation eligibility status (NHDD item P16) is routinely recorded as *4 -Entitled other patient* in some States and in other States the Patient accommodation eligibility status of the mother is used for the baby. For this reason, data for unqualified neonates are not able to be used in the calculation of the public patient bed day proportion.

Adjusting for casemix

Casemix refers to the numbers of each type of patient category a hospital treats. Hospitals collect data that allow admitted patient episodes to be classified using the Australian National-Diagnosis Related Groups (AN-DRG) casemix classification system. This system groups episodes of similar clinical condition and resource use into some 500 categories or AN-DRGs. Using casemix data, it is possible to model the total costs against the casemix, producing a set of 'cost weights'. The set of cost weights is a relative value scale for all AN-DRGs, calculated so that the average cost weight across all episodes used to produce the set of weights is 1.00. Once a set of cost weights has been produced, it is possible to determine the average cost weight for a hospital or group of hospitals. The average cost weight is calculated as follows:

$$\text{Average cost weight} = \frac{\sum_{i=1}^n (CW_i \times \text{Separations}_i)}{\text{Total no. of separations}}$$

where i represents each of n AN-DRGs (the five versions of the classification system released to date have different numbers of AN-DRGs), and CW is the cost weight for the i th AN-DRG.

The average cost weight is useful because it represents in a single number the overall complexity of cases treated by a hospital. If the national cost weights are used in the calculation of an average cost weight, then the resultant weight is an indicator of the relative costliness of the hospital's casemix with respect to the national average. For example, a hospital with an average cost weight of 1.08 has an 8% more costly casemix than the national average (by design equal to 1.00).

The average cost weight is used in this report to adjust for differences in the relative costliness of all patients treated in a hospital compared with another hospital or group. The value for a group of hospitals is multiplied by the total number of separations for that group to produce the number of casemix-adjusted separations. The term '*cost per casemix-adjusted separation*' derives from this use of the number of separations adjusted by relative costliness. Hospital morbidity data provided to the National Hospital Morbidity Database were used to estimate average cost weights for the groups of hospitals reported in the current review. Version 3.1 of the classification system was used to allocate patient episodes to AN-DRGs. Cost weights were supplied by the Department of Health and Family Services, Classification and Payments Branch from the 1996–97 National Costing Study.

Estimating total medical costs

For the medical labour costs category, data are readily available only for public patients, as private patients are charged directly by their doctor for medical services. Private patients are those patients who are treated by a doctor of their choice (as opposed to a hospital-nominated doctor) or choose to be accommodated in a single room. Charges for such private medical services are reimbursed up to 100% of the Medicare schedule fee for the service through a combination of Medicare and private health fund rebates, and are not included in the recurrent expenditure figures. Although Medicare data on in-hospital services are available, they are not sufficiently detailed to allow the allocation of costs to the groups of hospitals reported. The method used estimates total medical costs, calculated as sum of

salary/sessional and VMO payments divided by public patient proportion. This is an estimate of the medical costs for all patients, including private, compensable and ineligible.

Other data inconsistencies

There remain a number of other inconsistencies in the data both at the item level and at the total level. For example

- Some States and hospitals reported their payroll tax as part of the relevant salary cost centre, while others reported their payroll tax as a component in other recurrent costs. Veterans Affairs, Victorian and South Australian public hospitals are payroll tax exempt.
- Interest payments are not reported at the hospital level in some States (see table 3.2).
- When VMOs are paid at sessional rates they can be paid through payroll systems or accounts. As a result they may be classified as sessional staff or VMOs in different States, blurring distinctions between the Salaried/Sessional Medical Staff and VMO categories.

Appendix 4: ICD-9-CM codes for sentinel procedures

Procedure	ICD-9-CM codes
Appendicectomy	47.0
Angioplasty	36.01, 36.02, 36.05, 36.06, 36.07
Caesarean section	74.0, 74.1, 74.2, 74.4, 74.99
Cholecystectomy	51.2
Coronary artery bypass graft	36.1
Endoscopies	
Oesophagus	42.23, 42.24
Stomach	44.13, 44.14
Small intestine	45.13, 45.14, 45.16
Colon	45.23–45.25
Hip replacement	81.51, 81.52, 81.53
Hysterectomy	68.3–68.8
Lens insertion	13.7
Tonsillectomy ± adenoidectomy	28.2, 28.3

Source: National Coding Centre (NCC) 1996. The Australian version of the International Classification of Diseases, 9th revision, clinical modification (ICD-9-CM), University of Sydney, Sydney.

Appendix 5: Related publications

Australian Hospital Statistics, 1996–97 is complemented by other recent national publications that have also released hospital statistics:

- Previous years' data in the National Hospital Morbidity Database and the National Public Hospital Establishments Database were summarised in *Australian Hospital Statistics 1995–96* (AIHW 1997a) and *Australian Hospital Statistics 1993–95: An Overview* (AIHW 1997c).
- Establishment-level data on the resources and activities of private hospitals are compiled and published annually by the Australian Bureau of Statistics. Data for 1996–97 are presented in *Private Hospitals, Australia 1996–97* (ABS 1998).
- Analysis of hospital activity based on the AN-DRG classifications were released in Australian Casemix Report on Hospital Activity series for 1991–92 to 1995–96 (Department of Health and Family Services 1993, 1994, 1995, 1996, 1997).
- The *First National Report on Health Sector Performance Indicators* reported national hospital data against a range of indicators of hospital performance (National Health Ministers' Benchmarking Working Group 1996).
- Hospital performance indicator data have been released also in the *Report on Government Service Provision 1997* (Steering Committee for the Review of Commonwealth/State Service Provision 1997) and the *Report on Government Services 1998* (Steering Committee for the Review of Commonwealth/State Service Provision 1998).
- The *National Mental Health Report 1996* provides details on hospital psychiatric services for 1996 (Commonwealth of Australia 1998).
- Statistics on the hospital-based pharmaceutical, nursing and medical workforces are respectively included in *Pharmacy labour force 1994*, *Nursing labour force 1993 and 1994* and *Medical labour force 1995* (AIHW 1996b, 1997d, 1998a).

Glossary

For further information on the terms used in this report, refer to the definitions in use in 1996–97 in the *National Health Data Dictionary* Version 5.0.

<i>Acute</i>	Having a short and relatively severe course.
<i>Acute hospitals</i>	<p>Establishments which provide at least minimal medical, surgical or obstetric services for in-patient treatment and/or care, and which provide round-the-clock comprehensive qualified nursing service as well as other necessary professional services. They must be licensed by the State health department, or controlled by government departments. Most of the patients have acute conditions or temporary ailments and the average stay per admission is relatively short.</p> <p>Public acute hospitals are funded by the State health authority and include both recognised and non-recognised hospitals. Recognised hospitals are those nominated by States and Territories and accepted by the Commonwealth and appear in schedules to each State/Territory Medicare agreement (schedule B in the current Medicare agreements).</p>
<i>Additional diagnoses</i>	Diagnoses or conditions that affect a person's care in terms of requiring therapeutic treatment, clinical evaluation, diagnostic procedure, extended length of hospital stay or increased nursing care and/or monitoring. Additional diagnoses include co-morbid conditions (co-existing conditions) and/or complications (conditions that arose during the episode of care).
<i>Administrative and clerical staff</i>	Staff engaged in administrative and clerical duties. Civil engineers and computing staff are included in this category. Medical staff and nursing staff, diagnostic and health professionals and any domestic staff primarily or partly engaged in administrative and clerical duties are excluded.
<i>Administrative expenditure</i>	All expenditure incurred by establishments (but not central administrations) of a management expenses/administrative support nature such as any rates and taxes, printing, telephone, stationery and insurance expenses (including workers' compensation).
<i>Admitted patient</i>	A patient who undergoes a hospital's formal admission process.
<i>Admitted patient cost proportion</i>	The ratio of admitted patient costs to total hospital costs, also known as the inpatient fraction or IFRAC.
<i>Australian National Diagnosis Related Groups (AN-DRGs)</i>	An Australian system of Diagnosis Related Groups (DRGs). DRGs are a means of classifying hospital patients to provide a common basis for comparing factors such as cost-effectiveness and quality of care across hospitals. Each AN-DRG represents a class of patients with similar clinical conditions requiring similar hospital services.

<i>Available beds</i>	Beds immediately available for use by admitted patients as required.
<i>Average length of stay</i>	The average number of patient days for admitted patient episodes. Patients admitted and separated on the same day are allocated a length of stay of 1 day.
<i>Boarder</i>	A person who is receiving food and/or accommodation but for whom the hospital does not accept responsibility for treatment and/or care. A boarder is not admitted to the hospital, although a hospital may register a boarder. All babies born in hospital are excluded.
<i>Compensable patients</i>	Those patients entitled to, or who have been paid, compensation, damages, or other benefits in respect of the injury, illness or disease for which they have received care or treatment. More information is contained in the <i>National Health Data Dictionary</i> Version 5.0.
<i>Cost weights</i>	Cost weights represent the costliness of an AN-DRG relative to all other AN-DRGs such that the average cost weight for all separations is 1.00. A separation for an AN-DRG with a cost weight of 5.0 therefore, on average, costs ten times as much as a separation with a cost weight of 0.5. There are separate cost weights for AN-DRGs in the public and private sectors, reflecting the differences in the range of costs in the different sectors. The cost weights used in this report are 1996–97 national cost weights for AN-DRG v3.1 (Department of Health and Family Services, unpublished).
<i>Department of Veterans' Affairs hospitals</i>	Hospitals operated by the Commonwealth Department of Veterans' Affairs to provide hospital treatment for eligible veterans and their dependants at Commonwealth expense. Department of Veterans' Affairs hospitals are recorded as public sector hospitals for data reporting purposes.
<i>Diagnostic and health professionals</i>	Qualified staff (other than qualified medical and nursing staff) engaged in duties of a diagnostic, professional or technical nature (but also including diagnostic and health professionals whose duties are primarily or partly of an administrative nature). This category includes all allied health professionals and laboratory technicians but excludes civil engineers and computing staff.
<i>Domestic and other staff</i>	Staff engaged in the provision of food and cleaning services. They include domestic staff, such as food services managers, primarily engaged in administrative duties. This category also includes all staff not elsewhere included (primarily maintenance staff, tradespersons and gardening staff).
<i>Domestic services expenditure</i>	The costs of all domestic services including electricity, other fuel and power, domestic services for staff, accommodation and kitchen expenses but not including salaries and wages, food costs or equipment replacement and repair costs.
<i>Drug supplies expenditure</i>	The cost of all drugs including the cost of containers.
<i>Edit-DRGs</i>	Seven AN-DRGs to which separations are grouped if their records contain clinically inconsistent or invalid information.

<i>Eligible Department of Veterans' Affairs patient</i>	An eligible person whose charges for this hospital admission are met by the Department of Veterans' Affairs (DVA). These data are as supplied by the States and Territories and the eligibility to receive hospital treatment as a DVA patient may not necessarily have been confirmed by the Department.
<i>Eligible other patient</i>	An eligible person who does not meet the criteria to be an eligible public, private or Department of Veterans' Affairs patient. This category includes compensable patients, patients with Australian Defence Force personnel entitlements and common law cases.
<i>Eligible person</i>	Under Medicare, an eligible person means a person who resides in Australia and whose stay in Australia is not subject to any limitation as to time imposed by law. Except where they are covered by reciprocal health care agreements, foreign diplomats, their families and persons visiting Australia are excluded.
<i>Eligible private patient</i>	An eligible person who, <ul style="list-style-type: none"> • on admission to a public hospital or soon after, elects to be a private patient treated by a medical practitioner of his or her choice, or elects to occupy a bed in a single room. Such a private patient is responsible for meeting certain hospital charges as well as the professional charges raised by any treating medical or dental practitioner, or • chooses to be admitted to a private hospital. Such a private patient is responsible for meeting all hospital charges as well as the professional charges raised by any treating medical or dental practitioner.
<i>Eligible public patient</i>	An eligible person who, on admission to a public hospital or soon after, elects to be a public patient, or an eligible public patient whose treatment is contracted to a private hospital. A public patient is entitled to receive care and treatment without charge.
<i>Enrolled nurses</i>	Second-level nurses who are enrolled in all States except Victoria where they are registered by the State registration board to practise in this capacity. Includes general enrolled nurses and specialist enrolled nurses (e.g. mothercraft nurses in some States).
<i>External cause</i>	Environmental event, circumstance and/or condition as the cause of injury, poisoning and/or other adverse effect.
<i>Food supplies expenditure</i>	The cost of all food and beverages but not including kitchen expenses such as utensils, cleaning materials, cutlery and crockery.
<i>Full time equivalent staff</i>	Full time equivalent units are on-job hours worked and hours of paid leave (sick, recreation, long service, workers' compensation) by/for a staff member (or contract employee where applicable) divided by the number of hours normally worked by a full time staff member when on the job (or contract employee where applicable) under the relevant award or agreement.

<i>HASAC</i>	For hospitals where the IFRAC was not available or clearly inconsistent with the data, the inpatient costs are estimated by Health and Allied Services Advisory Council (HASAC) ratio (see Appendix 3).
<i>Hospital insurance</i>	Insurance in the categories of registered insurance (hospital insurance with a health insurance fund registered under the <i>National Health Act 1953</i> (Commonwealth)), or general insurance (hospital insurance with a general insurance company under a guaranteed renewable policy providing benefits similar to those available under registered insurance). Patients covered by insurance for benefits of ancillary services only are excluded.
<i>IFRAC</i>	The ratio of admitted patient costs to total hospital costs.
<i>Indigenous status</i>	Indigenous status of the person according to the following definition: <p style="padding-left: 40px;">An Aboriginal or Torres Strait Islander is a person of Aboriginal or Torres Strait Islander descent who identifies as an Aboriginal or Torres Strait Islander and is accepted as such by the community with which he or she is associated.</p> <p>Note that in the <i>National Health Data Dictionary</i> Version 5.0 this data item was titled Aboriginality.</p>
<i>Ineligible patient</i>	A patient who is not eligible under Medicare.
<i>Interest payments</i>	Payments made by or on behalf of the establishment in respect of borrowings (e.g. interest on bank overdraft) provided the establishment is permitted to borrow.
<i>Length of stay</i>	The length of stay of a patient is calculated by subtracting the date the patient is admitted from the date of separation. All leave days, including the day the patient went on leave, are excluded. A same day patient is allocated a length of stay of 1 day.
<i>Major Diagnostic Categories (MDCs)</i>	A high level of groupings of patients used in the AN-DRG classification.
<i>Medical and surgical supplies expenditure</i>	The cost of all consumables of a medical or surgical nature (excluding drug supplies) but not including expenditure on equipment repairs.
<i>Non-admitted patient occasion of service</i>	Occurs when a patient attends a functional unit of the hospital for the purpose of receiving some form of service, but is not admitted. A visit for administrative purposes is not an occasion of service.
<i>Non-admitted patients</i>	Patients who receive care from a recognised non-admitted patient service/clinic of a hospital.
<i>Not published</i>	Not available for separate publication but included in the totals where applicable.
<i>Other personal care staff</i>	This category includes attendants, assistants or home assistants, home companions, family aides, ward helpers, wards persons, orderlies, ward assistants and nursing assistants, engaged primarily in the provision of personal care to patients or residents, who are not formally qualified or undergoing training in nursing or allied health professions.

<i>Other recurrent expenditure</i>	Recurrent expenditure not included elsewhere in any of the recurrent expenditure categories.
<i>Other revenue</i>	All other revenue received by the establishment that is not included under patient revenue or recoveries (but not including revenue payments received from State or Territory Governments). This would include revenue such as investment income from temporarily surplus funds and income from charities, bequests and accommodation provided to visitors.
<i>Patient days</i>	The number of full or partial days' stay for patients who were admitted for an episode of care and who underwent separation during the reporting period. A patient who is admitted and separated on the same day is allocated 1 patient day.
<i>Patient revenue</i>	Revenue received by, and due to, an establishment in respect of individual patient liability for accommodation and other establishment charges.
<i>Patient transport</i>	The direct cost of transporting patients excluding salaries and wages of transport staff.
<i>Payments to visiting medical officers</i>	All payments made to visiting medical officers for medical services provided to hospital (public patients) on a sessionally paid or fee-for-service basis.
<i>Place of occurrence of external cause</i>	The place where the external cause of injury, poisoning or violence occurred.
<i>Pre-MDC</i>	Ten AN-DRGs to which separations are grouped, regardless of their principal diagnoses, if they involved procedures that are particularly resource intensive (transplants, tracheostomies or extracorporeal membrane oxygenation without cardiac surgery).
<i>Principal diagnosis</i>	The diagnosis established after study to be chiefly responsible for occasioning the patient's episode of care in hospital.
<i>Principal procedure</i>	The most significant procedure that was performed for treatment of the principal diagnosis. If no procedure is performed for treatment of the principal diagnosis, other procedures can be reported as the principal procedure. In order, these are a procedure performed for treatment of an additional diagnosis, a diagnostic/exploratory procedure related to the principal diagnosis or a diagnostic/exploratory procedure related to an additional diagnosis.
<i>Private hospital</i>	Privately owned and operated institution, catering for patients who are treated by a doctor of their own choice. Patients are charged fees for accommodation and other services provided by the hospital and relevant medical and paramedical practitioners. Acute and psychiatric hospitals are included.
<i>Psychiatric hospitals</i>	Institutions which provide treatment and care for patients with psychiatric, mental or behavioural disorders.

<i>Recoveries</i>	<p>All revenue received that is in the nature of a recovery of expenditure incurred. This would include:</p> <ul style="list-style-type: none"> • income received from the use of hospital facilities by salaried medical officers exercising their rights of private practice and by private practitioners treating private patients in hospital; and • other recoveries such as those relating to inter-hospital services where the revenue relates to a range of different costs and cannot be clearly offset against any particular cost.
<i>Recurrent expenditure</i>	Expenditure which recurs continually or frequently (e.g. salaries). It may be contrasted with capital expenditure, such as the cost of hospital buildings and diagnostic equipment, for which expenditure is made infrequently.
<i>Region</i>	<ul style="list-style-type: none"> • Capital cities statistical division • Other metropolitan centres urban centres with a population greater than or equal to 100,000 • Large rural centres (index of remoteness < 10.5): urban centres with a population between 25,000 and 99,000 • Small rural centres (index of remoteness < 10.5): urban centres with a population between 10,000 and 24,999 • Other rural areas (index of remoteness < 10.5): urban centres with a population less than 10,000 • Remote centres (index of remoteness > 10.5): urban centres with a population greater than 4,999 • Other remote areas (index of remoteness > 10.5): urban centres with a population less than 5,000. <p>For more information see <i>Rural, Remote and Metropolitan Areas Classification, 1991 Census edition</i> (DPIE & DSHS 1994).</p>
<i>Registered nurses</i>	Nurses with at least a 3-year training certificate and nurses holding postgraduate qualifications. Registered nurses must be registered with a State or Territory registration board.
<i>Repairs and maintenance expenditure</i>	The costs incurred in maintaining, repairing, replacing and providing additional equipment, maintaining and renovating building and minor additional works.
<i>Salaried medical officers</i>	Medical officers engaged by the hospital on a full time or part-time salaried basis.
<i>Same day patients</i>	Same day patients are admitted patients who are admitted and separate on the same date.
<i>Sentinel procedures</i>	Sentinel procedures are common surgical operations provided for serious health conditions in acute care hospitals. Sentinel procedures are often elective or discretionary, that is, alternative non-surgical treatments are available.

<i>Separation</i>	The term used to refer to the episode of care, which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). 'Separation' also means the process by which an admitted patient completes an episode of care by being discharged, dying, transferring to another hospital or changing type of care.
<i>Specialised service</i>	A facility or unit dedicated to the treatment or care of patients with particular conditions or characteristics.
<i>Student nurses</i>	Nurses employed by the establishment currently studying in years 1 to 3 of a 3-year certificate course. This includes any person commencing or undertaking a 3-year course of training leading to registration as a nurse by the State or Territory registration board. This includes full time general student nurses and specialist student nurses, such as mental deficiency nurses, but excludes practising nurses enrolled in post-basic training courses.
<i>Superannuation payments</i>	Contributions paid or (for an emerging cost scheme) that should be paid (as determined by an actuary) on behalf of establishment employees either by the establishment or a central administration such as a State health authority, to a superannuation fund providing retirement and related benefits to establishment employees.
<i>Trainee/pupil nurses</i>	Nurses that are commencing or undertaking a 1-year course of training leading to registration as an enrolled nurse on the State/Territory registration board (includes all trainee nurses).
<i>Type of admitted patient episode</i>	A classification of admitted patient episodes into broad groups based on principal diagnosis, principal procedure or status as a nursing home type or rehabilitation patient.
<i>Type of episode of care</i>	A phase of treatment for an admitted patient, categorised as acute care, rehabilitation care, palliative care, non-acute care, unqualified neonate or other. The total hospital stay of the patient may be made up of one or more episodes of care.
<i>Type of non-admitted patient occasion of service</i>	A broad classification of services provided to non-admitted patients. See Item A9 in the <i>National Health Data Dictionary</i> Version 5.0 for further details.
<i>Unqualified neonate</i>	A baby who is aged 9 days old or less that meets one of the following criteria: <ul style="list-style-type: none"> • is a single live birth or the first live born infant of a multiple birth, whose mother is currently an admitted patient; • is not admitted to an intensive care facility in a hospital, being a facility approved by the Commonwealth Minister for the purpose of the provision of special care.
<i>Visiting medical officer</i>	A medical practitioner appointed by the hospital board to provide medical services for hospital (public) patients on an honorary, sessionally paid, or fee-for-service basis.

References

- Australian Bureau of Statistics (ABS) 1996. Experimental projections, Aboriginal and Torres Strait Islander population, June 1991 to June 1996. Canberra: ABS Catalogue No. 3230.0.
- Australian Bureau of Statistics (ABS) 1997. Private hospitals, Australia 1995–1996. Canberra: ABS Catalogue No. 4390.0.
- Australian Bureau of Statistics (ABS) 1998. Migration Australia, 1996–1997. Canberra: ABS Catalogue No. 3412.0.
- Australian Council on Healthcare Standards (ACHS) 1998. Annual report 1996–97. Sydney: ACHS
- Australian Institute of Health and Welfare(AIHW) 1996a. Australia's health 1996: the fifth biennial health report of the Australian Institute of Health and Welfare. Canberra: AIHW.
- Australian Institute of Health and Welfare(AIHW) 1996b. Pharmacy labour force 1994. Canberra: AIHW (National Health Labour Force Bulletin no. 8).
- Australian Institute of Health and Welfare(AIHW) 1997a. Australian hospital statistics, 1995–96: Canberra: AGPS (Health Services Series no. 10).
- Australian Institute of Health and Welfare(AIHW) 1997b. Australian hospital statistics, 1993–95: an overview. Canberra: AGPS (Health Services Series no. 9).
- Australian Institute of Health and Welfare(AIHW) 1997d. Nursing labour force 1993 and 1994. Canberra: AIHW (National Health Labour Force Bulletin no. 9).
- Australian Institute of Health and Welfare(AIHW) 1998a. Medical labour force 1996. Canberra: AIHW (National Health Labour Force Bulletin no. 13) (in press).
- Australian Institute of Health and Welfare(AIHW) 1998b. Health Expenditure Bulletin no. 14. Canberra: AIHW (in press).
- Australian Institute of Health and Welfare(AIHW) 1998c. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. Canberra: AIHW.
- Australian Institute of Health and Welfare and Commonwealth Department of Health and Family Services 1997. First report on national health priority areas 1996. Canberra: AGPS.
- Commonwealth Department of Health and Family Services and 3M Health Information Systems 1996. Australian National Diagnosis Related Groups definitions manual version 3.1. Wallingford: 3M Health Information Systems.
- Commonwealth Grants Commission (CGC) 1997: Report on general revenue grant relativities 1997 update. Canberra: AGPS
- Commonwealth of Australia (CofA) 1998. National Mental Health Report 1996. Canberra: Department of Health and Family Services.
- Commonwealth of Australia (CofA) unpublished. Cost weights for AN-DRG Version 3, 1996–97 (Revised).
- Day P, Lancaster P & Huang J 1997. Australia's mothers and babies 1995. Perinatal Statistics Series no. 6. Sydney: AIHW National Perinatal Statistics Unit.
- Department of Health and Family Services 1997. Australian casemix report on hospital activity, 1995–96. Canberra: AGPS.

Department of Primary Industries and Energy(DPIE) and Department of Human Services and Health(DHSH) 1994. Rural, remote and metropolitan areas classification, 1991 Census edition. Canberra: AGPS.

Duckett SJ & Jackson TJ 1998. Do the elderly cost more? Casemix funding for elderly patients in acute patient settings. *Nursing Older People: Issues and Innovations*. MacLennan and Petty.

Gillett S & O'Connor-Cox D 1996. Exceptional case policy and paying for long stay patients in acute hospitals. Eighth Casemix Conference in Australia, Conference Proceedings. Canberra: Commonwealth Department of Human Services and Health.

Harvey R & Mathers C 1988. Hospital utilisation and costs study. Canberra: Commonwealth of Australia.

National Coding Centre 1996. The Australian version of the International Classification of Diseases, 9th revision, clinical modification (ICD-9-CM). Sydney: University of Sydney.

National Health Data Committee 1996. National health data dictionary version 5.0. Canberra: AGPS.

National Health Ministers' Benchmarking Working Group(NHMBWG) 1996. First national report on health sector performance indicators: public hospitals– the state of play. Canberra: Australian Institute of Health and Welfare.

National Health Ministers' Benchmarking Working Group(NHMBWG) 1998. Second national report on health sector performance indicators. Canberra: Department of Health and Family Services. (in press)

Organisation for Economic Co-operation and Development (OECD) 1997. OECD health data 97: a software for the comparative analysis of 29 health systems. Paris: OECD.

Steering Committee for the Review of Commonwealth/State Service Provision (SCRCSSP) 1997. Report on government service provision Volume 1. Melbourne: Industry Commission.

Steering Committee for the Review of Commonwealth/State Service Provision (SCRCSSP) 1998. Report on government services Volume 1. Melbourne: Industry Commission.