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Appendix 3: Technical notes

Definitions

If not otherwise indicated, data elements were defined according to the 1999–00 definitions in the *National Health Data Dictionary* Version 8.0 (summarised in the Glossary).

Unless otherwise specified:

- public acute hospitals and public psychiatric hospitals are included in the public hospital (public sector) category, and all public hospitals other than public psychiatric hospitals are included in the public acute hospital category.
- private psychiatric hospitals, private free-standing day hospital facilities and other private hospitals 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 5.7, 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 2.7 are presented by State or Territory of usual residence. The maps in Chapter 5 are also based on data on the State or Territory and Statistical Division of usual residence of the patient (see below).

Data presentation

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 are Table 2.5 and some tables for private hospitals in Chapters 7, 8 and 10. Although available, some data in these tables were not published, for confidentiality reasons. The abbreviation 'n.p.' has been used in these tables to denote this.

Throughout the publication, percentages may not add up to 100.0 due to rounding. Percentages and population rates printed as 0.0 or 0 may denote less than 0.05 or 0.5, respectively.

Population rates

Population rates presented in Chapters 2, 4, 5 and 6 are age-standardised, 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. The Australian Bureau of Statistics' population estimates for 31 December 1999 (Appendix 6) were used for the observed rates. The exceptions were Tables 6.7 and 6.8, for which the population estimates for the Aboriginal and Torres Strait Islander population (and the remainder of the population) and for the population for selected countries of birth for 30 June 1999, respectively, were used for the observed rates (Appendix 6). Rates in Table 2.7 and 6.8 were standardised by sex as well as by age.

Crude population rates in Chapters 7, 8 and 10 and age group-specific rates in Chapter 6 were calculated using Australian Bureau of Statistics' population estimates for 31 December 1999 (Appendix 6). For Figure 6.7, 30 June 1999 estimates for the Aboriginal and Torres Strait Islander population and for the remainder of the population were used for age group-specific rates for the Aboriginal and Torres Strait Islander population and others.

Newborn episodes of care and the reporting of separations for patients aged less than 10 days

The *Newborn* type of episode of care was introduced in 1998–99 to report a single episode of care for all patients aged 9 days or less at admission, regardless of their qualification status and whether they changed qualification status during their hospital stay. Thus these episodes can include qualified days only, a mixture of qualified days and unqualified days, or only unqualified days. Qualified days are considered to be the equivalent of acute care days and *Newborn* episodes with qualified days only are considered to be equivalent to *Acute care* episodes. *Newborn* episodes with no qualified days are considered to be equivalent to the previous category, *Unqualified neonate*. In this report, *Newborn* episodes with at least one qualified day have been included in all the tables reporting separations.

Three jurisdictions did not implement this *Newborn* definition in 1998–99 or 1999–00; therefore, for these States and Territories, there are no *Newborn* separations with a mixture of qualified and unqualified days reported (see Table 5.11). New South Wales, Queensland and public hospitals in South Australia and Victoria implemented the new definition in 1998–99, and the Australian Capital Territory implemented it in 1999–00. For the remaining jurisdictions, separations reported as *Acute care* separations for patients aged less than 10 days are included in the National Hospital Morbidity Database and this report as *Newborn* episodes with qualified days only. Separations reported to the Database as *Unqualified neonates* are included as *Newborn* episodes with no qualified days.

Prior to 1998–99, New South Wales, Queensland and South Australia (public hospitals) had counted separate episodes of care within a hospital stay as individual separations. With the implementation of the *Newborn* definition, they began to count each hospitalisation of a patient admitted under the age of 10 days as one separation. This change is likely to have resulted in a slight reduction in the number of separations for these States in 1998–99 and 1999–00 compared with 1997–98, and a slight increase in their average lengths of stay. Victoria had been reporting separations for these patients according to the *Newborn* definition (that is, using a single episode for these patients) prior to 1998–99 so this implementation is not likely to have markedly affected Victorian separation or average length of stay data.

In 1998–99 and 1999–00 Western Australia counted separations for patients aged 10 days or less on admission as qualified (*Acute care*) if at least one day was qualified. Tasmania and the Northern Territory continued to report a new episode of care for patients aged less than 10 days at admission with each change in qualification status. The reporting method used in Tasmania and the Northern Territory may mean that there were more separations for patients under the age of 10 days for these jurisdictions, relative to others, and that they had a lower average length of stay.

Hospital in the home care

Most States and Territories have hospital in the home programs in which admitted patients are provided with hospital care in their (permanent or temporary) place of residence as a substitute for hospital accommodation. This care has been defined in the *National Health Data Dictionary* version 10 (NHDC 2001) as occurring within an episode of care for an admitted patient, and days of hospital in the home care for each separation will be reported to the National Hospital Morbidity Database in 2001–02 data.

In 1999–00, there were no national definitions relating to hospital in the home care, and there was variation in the way in which States and Territories reported it. In Victoria, Queensland, Tasmania, the Australian Capital Territory and the Northern Territory, hospital in the home care was provided in 1999–00 as defined above, and separations including this care were included in the National Hospital Morbidity Database. In New South Wales, periods of hospital in the home care were not considered part of admitted patient episodes in 1999–00, with patients being either discharged when they physically separated from hospital or recorded as being on leave. In South Australia, hospital in the home care was defined as separate episodes of care, and reported as having *Other care* as the care type (see Chapter 5). Western Australia did not operate hospital in the home programs for admitted patients in 1999–00. This variation may have had the effect of slightly increasing the relative numbers of separations and reducing the average lengths of stay reported by South Australia, and of reducing the average lengths of stay for New South Wales compared with other States and Territories.

Private hospitals in the National Hospital Morbidity Database

The Internet tables for Appendix 5 include details of the private hospitals included in the National Hospital Morbidity Database. Data were not provided for 1999–00 for 15 free-standing day hospital facilities and one other private hospital in Victoria, all private free-standing day hospital facilities in the Australian Capital Territory, and the one private hospital in the Northern Territory. For South Australia, data were not available for three private free-standing day hospital facilities (one of which commenced operation in September 1999) and data were missing for March to June 2000, for May to June 2000 and for June 2000, respectively, for three others. For Tasmania, data were not available for one private free-standing day hospital facility and one other private hospital, and were missing for April to June 2000, December 1999 to June 2000, January and February 2000 and June 2000, respectively, for four other private hospitals.

As not all private hospital separations are included in the National Hospital Morbidity Database, the counts of private hospital separations presented in this report are likely to be underestimates of the actual counts. In 1998–99, the National Hospital Morbidity Database reported 110,941 (5.6%) fewer separations than the Australian Bureau of Statistics' Private Health Establishments Collection, which includes all private acute and psychiatric hospitals licensed by State and Territory health authorities and all private free-standing day hospital facilities approved by the Department of Health and Aged Care. However, the discrepancy may have also been affected by the use of differing definitions or different interpretations of definitions, or differences in the quality of the data provided for different purposes.

At the time of publication of this report, data for 1999–00 from the Private Health Establishments Collection were not available. When they become available, an estimate

will be made of the underenumeration of separations in the National Hospital Morbidity Database for 1999–00, by comparing it with the 1999–00 Private Health Establishments Collection data, and included with *Australian Hospital Statistics 1999–00* on the Internet.

ICD-10-AM coded data

Diagnosis, procedure and external cause data for 1999–00 were reported to the National Hospital Morbidity Database by all States and Territories except South Australia using the first edition of the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification* (ICD-10-AM) (National Centre for Classification in Health 1998).

Quality of ICD-10-AM coded data

The quality of coded diagnosis, procedure and external cause data can be assessed using coding audits in which, in general terms, selected records are independently recoded, and the resulting codes compared with the codes originally assigned for the separation. There are no national standards for this auditing, so it is not possible to use information on coding audits to make quantitative assessments of data quality on a national basis. The following information has, however, been provided by the States and Territories to provide some insight into the quality of the coded data in the National Hospital Morbidity Database.

Most States and Territories were unable to make specific comments on the quality of their 1999–00 ICD-10-AM coded data as there had been no formal audits of the data conducted, and instead provided some general comments on data quality. Several indicated that formal audits were planned for 2000–01 or 2001–02.

There was no formal statewide audit of ICD-10-AM coded data in New South Wales for 1999–00. However, there were no major quality issues in coded data detected in routine input processing and output editing of data. There are plans to introduce a formal measurement of coded data quality through a system of statewide audits for the year 2001–02. The methodology for these audits is currently being developed.

An audit of ICD-10-AM coded data in Victoria for 1999–00 indicated that the data were of high quality.

No audit was conducted in Queensland in the 1999–00 period, which was the first year in which this classification was used in Queensland. However, an audit of hospital morbidity data for separations for the 2000–01 financial year is scheduled to begin shortly, and will target several areas including coding quality.

The Health Department of Western Australia has an audit program which aims, over a period of two years, to assess different aspects of all public hospitals' records and procedures. The audit considers adherence to the admission policy, accuracy and completeness of source information and the subsequent coding of the information. When there is a change of DRG between the audited and the original data, the episode data (including the codes used) are analysed to explain the differences. The audit program has not completed sufficient checking to make a full assessment of data quality for 1999–00, which was the first year in which ICD-10-AM was used in Western Australia.

While no audits were conducted in 1999–00 (which was the first year in which ICD-10-AM was used in South Australia), an assessment of coding quality will be undertaken

during 2001–02 using the National Centre for Classification in Health’s Performance Indicators for Coding Quality (PICQ) software.

There was no formal statewide audit of ICD-10-AM coded data in Tasmania for 1999–00 which was the first year in which ICD-10-AM was used in that State. An audit of coding quality will be conducted in the 2001–02 financial year.

The Australian Capital Territory has undertaken a program of constant quality improvement in relation to admitted patient care data and during 1999–00 participated in the Performance Indicators for Quality Coding (PICQ) trial. Hospitals in the Territory also undertake regular internal coding audits and meet accreditation requirements.

A number of audits of ICD-10-AM coded data were undertaken in the Northern Territory for 1999–00. During 1999–00, Alice Springs, Katherine and Tennant Creek Hospitals carried out coding audits, which ranged in complexity. Alice Springs conducted ‘a number of in-house mini-audits’ which were based on the National Centre for Classification in Health’s Australian Coding Benchmark Audit (ACBA) tool, adjusted to the hospital’s circumstances. Katherine and Tennant Creek Hospitals pooled their efforts and coding staff to conduct one audit on allied health coding. In most instances the coding was identical or had acceptable differences. In the minority of cases, some incorrect coding was identified and became the focus of a review of coding cases of this kind. The need to improve documentation on the part of clinicians was highlighted, in particular as an ongoing educational requirement on the part of coders. It is noted with regret by Northern Territory Health Services that time constraints prevent more regular auditing.

Data mapping for South Australia

In this report, ‘mapping’ refers to the process of finding an ‘equivalent’ code between two classifications, for example, to enable national data to be presented in a single classification.

South Australia mapped the data collected using the 1st Edition of ICD-10-AM forward to codes of the 2nd edition of ICD-10-AM (National Centre for Classification in Health 2000) before providing them to the Institute. Where mapped codes could be identified (because they were invalid 1st Edition codes), the Institute mapped the South Australian data backward to 1st Edition codes so that national data could be presented in a single classification in this report. The mapped data are not completely equivalent to unmapped data, so this means that the South Australian data should be interpreted with these mappings in mind. The maps are available from the Institute if required.

The South Australian forward mapping tables were developed by selecting the most clinically appropriate code in 2nd Edition ICD-10-AM based on the description of the code in 1st Edition ICD-10-AM. The majority of diagnosis code maps were one-to-one maps, meaning that a diagnosis code in 1st Edition ICD-10-AM was mapped to one diagnosis code only in 2nd Edition ICD-10-AM. Others were many-to-one maps, where more than one diagnosis code in 1st Edition ICD-10-AM was mapped to only one diagnosis code in 2nd Edition ICD-10-AM.

Where there was a one-to-one relationship between 1st Edition and 2nd Edition diagnosis codes (and the 2nd Edition code was invalid as a 1st Edition code), the Institute reversed the South Australian forward map. Where there was a many (1st Edition) to one (2nd Edition) relationship, the 2nd Edition diagnosis code was mapped back to the most general 1st Edition diagnosis code (based on the description). In this instance specificity of the data was lost.

There were very few changes between ICD-10-AM 1st Edition and ICD-10-AM 2nd Edition for external cause codes, with changes between the two editions mainly to place of occurrence and activity codes. There were also some changes in relation to the detail recorded on the type of firearms involved in causing injury, on contact with hornets, wasps and bees, and for some transport accidents. In many of these cases the ICD-10-AM 2nd Edition provided more detailed categories than the 1st Edition, so the South Australian maps were to non-specific 2nd Edition codes. In these cases, the Institute was able to simply reverse the South Australian forward map.

There were significant changes in procedure codes between ICD-10-AM 1st Edition and ICD-10-AM 2nd Edition. As for diagnosis codes, where there was a one-to-one relationship between 1st Edition and 2nd Edition procedure codes (and the 2nd Edition code was invalid as a 1st Edition code) the Institute reversed the South Australian forward map. Similarly, if there was a many (1st Edition) to one (2nd Edition) relationship, then the 2nd Edition procedure code was mapped back to the most general 1st Edition procedure code (where there was one available). Where there was not a general procedure code available, the 2nd Edition procedure code was mapped back to the 1st Edition procedure code in the group that was most commonly reported (by the other States and Territories for 1999–00 and by New South Wales, Victoria, the Australian Capital Territory and the Northern Territory for 1998–99).

The South Australian forward maps for procedure codes included combination maps for *Allied health interventions* (blocks 2050–2140). These combinations allowed forward mapping of the type of intervention and the type of clinician. As most States and Territories provide data for generalised allied health interventions (e.g. dietetics, social work), rather than detailed information on the type of intervention (e.g. assessment, counselling), where a 2nd Edition code (providing detail on the type of intervention) was used in combination with a generalised allied health intervention code (95550-00–95550-11), the Institute deleted the 2nd Edition (type of intervention) code from the record. In some cases a 2nd Edition intervention-specific code was used in a record without a code specifying the type of clinician. In that case the 2nd Edition code was mapped to a selected 1st Edition code using the procedures outlined above.

Patient days

Patient days provide information on the length of stay of patients and are calculated as the difference between the separation date and admission date, less any leave days. Same day patients are allocated a length of stay of one day.

As the databases contain records for patients separating from hospital during the year, this definition means that not all patient days reported will have occurred in the reporting period (1 July 1999 to 30 June 2000) and, therefore, cannot be used to calculate accurate financial year-based activity estimates. It is expected, however, that in acute hospitals, patient days for patients who separated in 1999–00, but who were admitted in 1998–99, would be counterbalanced by the patient days for patients in hospital on 30 June 2000 who will separate in the following reporting period, and for whom data will be reported in the data collection for the 2000–01 year. 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.

Codes used for selected procedures

Table 2.7 presents separation rates for selected procedures. The table was originally defined as a performance indicator of the National Health Ministers' Benchmarking Working Group (NHMBWG) to provide comparative data between jurisdictions for a defined set of procedures. The procedures were chosen largely on the basis of the frequency with which they were undertaken and because they were often elective and discretionary, and there are often treatment alternatives available (NHMBWG 1998). The additional procedures in the table were included after consultation with the States and Territories.

The selected procedures were originally specified using ICD-9-CM codes. With the introduction of ICD-10-AM, they were respecified using ICD-10-AM codes (Table A3.1), as described in Appendix 6 of *Australian Hospital Statistics 1998–99*.

Table A3.1: ICD-10-AM codes for the selected procedures in Table 2.7

Procedure	ICD-10-AM codes
Appendicectomy	Block 926
Angioplasty	Blocks 669, 671, codes 35304-00, 35305-00
Caesarean section	Block 1340
Cholecystectomy	Block [965]
Coronary artery bypass graft	Blocks 672–679
Myringotomy (with insertion of tube)	Codes 41632-00, 41632-01
Knee replacement	Blocks 1518, 1519, 1523, code 49527-00
Prostatectomy	Blocks 1165, 1167, codes 37200-06, 37207-00, 37207-01, 90407-00, 36839-01, 36839-03
Arthroscopic procedures (includes arthroscopies)	Codes 48945-00, 48945-01, 48948-00, 48948-01, 48948-02, 48951-00, 48954-00, 48957-00, 48960-00, 49109-00, 49118-00, 49118-01, 49121-00, 49121-01, 49121-02, 49121-03, 49121-04, 49218-00, 49218-01, 49221-00, 49221-01, 49221-02, 49224-00, 49224-01, 49224-02, 49227-00, 49360-00, 49363-00, 49366-00, 49366-01, 49539-00, 49542-00, 49557-00, 49557-01, 49557-02, 49558-00, 49558-01, 49558-02, 49559-00, 49560-00, 49560-01, 49560-02, 49560-03, 49561-00, 49561-01, 49561-02, 49562-00, 49562-01, 49562-02, 49563-00, 49566-00, 49700-00, 49700-01, 49703-00, 49703-01, 49703-02, 49703-03, 49703-04, 50100-00, 50100-01, 50102-00, 53215-00, 53218-00, 53218-01, 53218-02, 90600-00

Data on geographical location of hospital

Data on the number of public acute and psychiatric hospitals and available beds per 1,000 population by metropolitan, rural and remote region are presented in Table 3.4.

Information on the Rural, Remote and Metropolitan Area (RRMA) of hospital is derived from data supplied by the States and Territories for the National Public Hospital Establishments Database on the geographical location of the establishment. The *National Health Data Dictionary* specifies that these data should be provided as the State or Territory and the Statistical Local Area (SLA) of the establishment. SLAs are small units within the Australian Bureau of Statistics' Australian Standard Geographical Classification (ASGC). The Rural, Remote and Metropolitan Areas Classification allocates each SLA to a category based primarily on population numbers and an index of remoteness. The classification is as follows:

- Capital cities: capital city statistical divisions

- 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.

For more information see Rural, Remote and Metropolitan Areas Classification, 1991 Census edition (DPIE & DSHS 1994).

Data on Statistical Division of usual residence

Data on the Statistical Division of usual residence of admitted patients are presented in maps in Chapter 5 (Figures 5.1 and 5.2). The data used for these maps were derived from data supplied for each separation by the States and Territories for the National Hospital Morbidity Database on the area of usual residence of the patients. The *National Health Data Dictionary* specifies that these data should be provided as the State or Territory and the SLAs of usual residence. SLAs can be aggregated to Statistical Divisions for reporting, as in the maps in this publication. The data on the State or Territory of usual residence are reported in Chapter 5 (Tables 5.7, 5.8, 5.9 and 5.10).

Although most separations included data on the State or Territory of usual residence, not all States and Territories were able to provide information on the area of usual residence in the form of an SLA code, using the 1999 edition of the ASGC. If SLA information was unavailable for a patient then postcode was requested. The Institute then mapped the supplied data to 1999 and 1996 SLAs, as far as possible. SLAs were derived from postcodes based on the probabilities that persons for whom a postcode was reported were resident in each SLA. Similarly, 1999 and 1996 SLA codes were derived from SLA codes from earlier and later editions of the ASGC on a probabilistic basis. The standardised 1996 SLA data were then aggregated to Statistical Division data for presentation in maps.

New South Wales, Victoria, the Australian Capital Territory and the Northern Territory were able to provide SLA codes for both patients usually resident in the jurisdiction and patients not usually resident in the jurisdiction. Queensland, South Australia and Tasmania provided SLA codes (or Local Government Area codes) for patients usually resident in the jurisdiction and postcodes for patients usually resident elsewhere. Western Australia provided postcodes for both patients usually resident in the jurisdiction and patients not usually resident in the jurisdiction.

The mapping process identified missing, invalid and superseded codes, but resulted in 98.2% of records being assigned SLA codes. Data for the two Statistical Divisions in the Australian Capital Territory were combined for mapping purposes because of the very small population of one of the Statistical Divisions.

Appendix 4: Cost per casemix-adjusted separation methodology

Introduction

Table 2.1 presents a measure of the average cost of providing care for an admitted patient (whether an overnight-stay patient or a same day patient), adjusted for the relative complexity of the patient’s clinical condition and of the hospital services provided. This is an important efficiency performance indicator. The cost per casemix-adjusted separation does not, however, take account of the quality of care delivered within a hospital nor the health outcomes achieved.

The methodology used to calculate the cost per casemix-adjusted separation for this report uses the method agreed by the National Health Ministers’ Benchmarking Working Group (NHMBWG 1998).

The scope of hospitals included in this benchmarking efficiency indicator has been agreed between the States and Territories, and has progressively narrowed in the last few years by excluding atypical hospitals. In 1999–00 the following types of hospitals were excluded – psychiatric, drug and alcohol services, mothercraft hospitals, hospices, rehabilitation facilities, small non-acute and multi-purpose services and ‘unpeered and other’ hospitals (defined on p. 17). These accounted for 96% of total separations and 84% of total bed days.

The methodology includes all admitted patient separations and their associated costs. It is appropriate to include the 97% of separations, which are acute in this calculation, as cost weights are available for each of the acute separations. However the 3% of separations which are not acute (Table A4.1) are also included and, as there are no cost weights for the non-acute separations, the cost weight for the acute separations is used. This means the overall cost per separation is decreased, and it is decreased by a different amount in each State according to the proportion of non-acute separations in that State. To improve this situation, every State would need to estimate the cost of acute admitted patient separations, separately from the cost of all separations. Data provided by some jurisdictions on acute separation expenditures will be published later in the year.

The Institute hopes that all jurisdictions will soon be in a position to provide data on the costs of treating acute admitted patients that are separated in a year. In addition, if the States are able to provided cost weights, e.g. AN-SNAP weights for the admitted patient episodes which are not acute, then it will be possible to publish a cost per palliative care separation, a cost per rehabilitation care separation, a cost per maintenance care separation, etc., as well as a more accurate cost per total separation.

Definitions

Cost per casemix-adjusted separation is calculated as:

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

where IFRAC (admitted patient fraction) is the estimated proportion of total hospital costs related to admitted patients and the 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 is described below.

Recurrent expenditure for this indicator is defined by the recurrent expenditure data elements in the *National Health Data Dictionary*.

Total separations excludes *Newborns* with no qualified days, and boarders, as defined in the Glossary. 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 and Territories 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 these analyses (see Table 3.7 for available data on depreciation).

The cost per casemix-adjusted separation can not be used as the sole measure of the efficiency of the different jurisdictions in providing hospital services, as some of the costs incurred are costs beyond the control of a jurisdiction. For example, the Northern Territory has high staffing and transport costs, and treats a greater proportion of Aboriginal and Torres Strait Islander patients than other jurisdictions. Because of factors such as these, cost disabilities associated with providing the same level and standard of hospital services available elsewhere in Australia are recognised by the Commonwealth Grants Commission (CGC). Cost disability refers to variables such as remoteness, high input costs and socioeconomic factors that increase the cost of providing services. Other jurisdictions suffer cost disabilities for other reasons. Factors such as these should be taken into account when making comparisons.

Further work

It has been proposed that further work should be undertaken to refine the methodology so as to enhance the usefulness of these data. This report splits the hospitals into peer groups to enable comparison at a more appropriate level (Chapter 2).

There are a number of alternatives which could improve the analysis which are being considered including:

- Calculating the casemix adjustments by estimating cost weights for patients other than Acute (using AN-SNAP cost weights for example)
- Estimating costs at other levels such as peer group (Chapter 2), program or diagnostic groupings.
- Broadening the analysis to include non-admitted patient care and other hospital outputs such as teaching, research and preventive services. If relative cost weights for each of these outputs can be calculated, then eventually there can be an indicator of overall cost per adjusted output unit for all hospital outputs. Inconsistency in definitions between jurisdictions in this area need to be overcome to enable these analyses to be undertaken.

Scope

For the purposes of improving the comparability of data across jurisdictions and increasing the accuracy of the analysis, the scope for Table 2.1 has been restricted to those hospitals, which mainly provide acute care. The hospitals excluded are: multi-purpose services; hospices; rehabilitation hospitals; mothercraft hospitals; other sub-acute hospitals (e.g. geriatric care centres providing a mix of rehabilitation and nursing home type care); small non-acute hospitals and psychiatric hospitals; and 'Unpeered and other' group. The 'Unpeered and other' group contains hospitals with fewer than 200 separations; acute metropolitan hospitals with less than 2,000 separations (mainly small specialised hospitals such as dental hospitals, pregnancy advisory centres etc); and hospitals that cannot be classified due to atypical events such as being closed, major flood or fire. The selected hospitals in Table 2.1 account for 96% of separations in public acute and psychiatric hospitals, and 84% of bed days.

The scope of public hospital establishments included in the calculation of the cost per casemix-adjusted separation figures is different from the scope of the data reported in all other tables. It is very similar to the scope for the cost per casemix adjusted separation figures in 1998-99 but different to the 1995-96 to 1997-98 data (AIHW 1997b, 1998, 1999a, 2000f, SCRCSSP 2000).

Determining costs for admitted patients

The efficiency indicator published in Table 2.1 covers the costs of all admitted patients. Ideally, costs for acute admitted patients only would be used in this indicator. At present the only cost weights available for all of Australia are the Australian Refined Diagnosis Related Groups cost weights which only apply to acute admitted patients.

To determine the costs associated with admitted patients, an admitted patient fraction (IFRAC) is used. The IFRAC is an expression of the ratio of admitted patient costs to total hospital costs. The IFRAC is generally estimated at a hospital level from the results of patient costing data, or from surveys of each department.

$$\text{IFRAC} = \frac{\text{Admitted patient cost}}{\text{Total cost}}$$

Teaching and research costs should not be included in admitted patient costs, but often parts of these costs are.

For hospitals where the IFRAC was not available or clearly inconsistent with the data, the admitted patient costs were estimated using the Health and Allied Services Advisory Council (HASAC) ratio (see AIHW: Cooper-Stanbury et al. 1994). The HASAC IFRAC is calculated using the following formula:

$$\text{IFRAC}_H = \frac{\text{Patient days}}{\text{Patient days} + \left(\frac{\text{NAPOOS}}{\text{Ratio}} \right)}$$

Where NAPOOS = Non-admitted patient occasions of service;

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. The HASAC method is used in this report to

estimate IFRACs for small hospitals only, and none of these hospitals are in the benchmarking group of hospitals in Table 2.1.

Ideally, different IFRACs would be used for different cost categories; so that categories like food and pharmaceuticals which were almost exclusively for admitted patients would have a very high IFRAC. In the absence of comprehensive sets of IFRACs, a single hospital-wide IFRAC was applied to all cost categories.

Admitted patients other than acute patients

It was not possible for all jurisdictions to isolate the costs of acute admitted patients from all admitted patient costs (as defined by the *National Health Data Dictionary* data element *Type of episode of care*). Because costs are being estimated per separation and not per patient day most of the non-acute admitted patients (including rehabilitation and non-acute 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 3% of total admitted patient episodes in the selected hospitals and account for approximately 15% of patient days in the selected hospitals (Table A4.1).

There is also variation in the application of the episodes of care and type of episode of care between States and Territories. In States or Territories where there is a clear delineation in funding arrangements between acute and non-acute services, the split between acute and other types of patients may be different from where this is done purely on a statistical basis.

Care needs to be taken when the comparison is done that allowance is made for uncertainty introduced by these episodes for which the cost weights are invalid. Table A4.1 shows that there is significant variation in the number and length of stay for the separations other than acute between jurisdictions

Adjusting for casemix

The average cost weight is used in this report to adjust for differences in the relative costliness of all acute admitted 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.

Casemix refers to the numbers and types of admitted patients a hospital treats. Hospitals collect data that allow admitted patient episodes to be classified using the Australian National Diagnosis Related Groups (AR-DRG) version 4 casemix classification system. This system groups episodes of similar clinical condition and resource use into 661 categories or AR-DRGs. The National Hospital Cost Data Collection has collected data to produce a cost weight for each AR-DRG (see Appendix 8). The set of cost weights is a relative value scale for all AR-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:

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

where i represents each of the 661 AR-DRGs and CW_i is the cost weight for the i th AR-DRG (the different versions of the classification system released to date have different numbers of AR-DRGs).

The average cost weight for a hospital 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).

Hospital morbidity data provided to the National Hospital Morbidity Database were used to estimate average cost weights for the groups of hospitals reported in this analysis. In 1998–99 Version 4.0/4.1 cost weights were supplied by the Department of Health and Aged Care, from the 1998–99 NHCDC. The 1998–99 cost weights were applied to 1999–00 hospital data as the NHCDC 1999–00 weights were not available.

The complexity of cases treated as admitted patients can differ regionally. Some jurisdictions admit patients who might be treated as non-admitted patients in other jurisdictions. Age structures are less of a concern in comparing States and Territories, and the AR-DRG adjustment is deemed to compensate for the differences in costs due to the higher proportion of older patients in some jurisdictions (Gillett & O'Connor-Cox 1996; Duckett & Jackson 1998).

The validity of comparisons of average cost weights is limited by differences in the extent to which each jurisdiction's psychiatric services are integrated into its public hospital system as service delivery changes under the National Mental Health Strategy. For example, in Victoria, almost all public psychiatric hospitals are now mainstreamed into acute hospital services and psychiatric patient data are therefore included in the acute hospital reports. Cost weights are not as useful as measures of resource requirements for acute psychiatric services because the relevant AR-DRGs are less homogeneous than for other acute services.

Estimating total medical costs

For the medical labour cost 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 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 cost of private patients is therefore estimated by assuming that a patient day of care by a medical practitioner costs the same, whether the patient is public or not. The private patient medical costs are then estimated by pro-rating the sum of salary/sessional and VMO payments according to the number of public patient days and the number of private patient days. This is equivalent to multiplying by one minus the public patient day proportion and dividing by the public patient day proportion. The underlying assumption ignores a number of factors including the propensity for junior medical staff to provide

care to private patients and for doctors with private patients to charge at higher rates than they would charge the public system under a contract for public patients.

Payroll tax

Only Tasmanian hospitals are liable for a significant proportion of payroll tax. The Institute has worked with the Department of Human Services Tasmania to remove payroll tax costs from the cost per casemix-adjusted separation table. While New South Wales hospitals are payroll tax exempt, payroll tax is paid for central office and some other support service staff. The amount is insignificant with respect to the New South Wales total. While Queensland hospitals pay payroll tax it is reimbursed and in theory should not be included in any accounts as reported to the National Public Hospital Establishments Database. In practice there is a very small amount reported due to administrative lags and other inconsistencies. No action has been taken to remove this small amount of payroll tax from Queensland or New South Wales data.

Table A4.1: Summary of all episodes of care in public acute hospitals selected for Table 2.1 Cost per casemix-adjusted separation^(a) States and Territories, 1999–00

Variable	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Total separations ('000)	1,186	977	668	346	337	72	61	58	3,705
Total patient days ('000)	4,550	3,670	2,280	1,222	1,163	297	210	195	13,588
Acute separations^(b)	1,160	948	640	341	330	71	60	57	3,607
Separations ('000)	1,160	948	640	341	330	71	60	57	3,607
Proportion of all separations	98%	97%	96%	99%	98%	98%	99%	98%	97%
Patient days ('000)	4,148	3,053	1,987	1,118	1,056	250	196	182	11,991
Proportion of all patient days	91%	83%	87%	92%	91%	84%	93%	94%	88%
Acute psychiatric care separations^(b)									
Separations ('000)	22	19	20	11	6	2	2	2	85
Proportion of all separations	2%	2%	3%	3%	2%	3%	3%	4%	2%
Patient days ('000)	205	279	180	95	66	17	14	14	871
Proportion of all patient days	4.5%	7.6%	7.9%	7.8%	5.7%	5.9%	6.6%	7.2%	6.4%
Acute non-psychiatric care separations									
Separations ('000)	1,138	929	620	331	324	69	58	55	3,523
Proportion of all separations	96%	95%	93%	96%	96%	95%	96%	95%	95%
Patient days ('000)	3,943	2,774	1,806	1,023	990	232	182	168	11,120
Proportion of all patient days	87%	76%	79%	84%	85%	78%	87%	86%	82%
Separations other than acute									
Rehabilitation separations ('000)	15.3	17.9	21.0	3.2	1.6	0.6	0.3	0.6	60.5
Proportion of all separations	1.3%	1.8%	3.1%	0.9%	0.5%	0.8%	0.5%	1.0%	1.6%
Patient days ('000)	217	315	122	80	24	14	7	5	783
Proportion of all patient days	4.8%	8.6%	5.4%	6.5%	2.0%	4.7%	3.1%	2.4%	5.8%
Palliative care separations ('000)	3.3	2.8	2.9	0.4	1.0	0.1	0.3	0.0	11.0
Proportion of all separations	0.3%	0.3%	0.4%	0.1%	0.3%	0.2%	0.6%	0.1%	0.3%
Patient days ('000)	33	37	24	5	12	1	5	1	119
Proportion of all patient days	0.7%	1.0%	1.1%	0.4%	1.1%	0.5%	2.6%	0.3%	0.9%
Non-acute separations ('000)	4.5	8.2	3.9	1.1	0.4	0.4	0.1	0.4	18.9
Proportion of all separations	0.4%	0.8%	0.6%	0.3%	0.1%	0.6%	0.1%	0.6%	0.5%
Patient days ('000)	142	265	145	19	52	30	2	7	663
Proportion of all patient days	3.1%	7.2%	6.4%	1.6%	4.4%	10.2%	1.1%	3.6%	4.9%
Other separations ('000)	3.7	0.0	0.3	0.0	3.6	0.1	0.0	0.0	7.7
Proportion of all separations	0.3%	0.0%	0.0%	0.0%	1.1%	0.2%	0.0%	0.0%	0.2%
Patient days ('000)	11	0	2	0	19	2	0	0	34
Proportion of all patient days	0.2%	0.0%	0.1%	0.0%	1.7%	0.5%	0.0%	0.0%	0.2%
Psychiatric care separations^(c)									
Separations ('000)	24	19	21	11	6	2	2	2	87
Proportion of all separations	2%	2%	3%	3%	2%	3%	3%	4%	2%
Patient days ('000)	220	279	188	99	69	17	14	15	901
Proportion of all patient days	5%	8%	8%	8%	6%	6%	7%	8%	7%
Total separations other than acute									
Separations ('000)	26.8	28.8	28.1	4.8	6.6	1.2	0.8	1.0	98.0
Proportion of all separations	2.3%	2.9%	4.2%	1.4%	2.0%	1.7%	1.2%	1.7%	2.6%
Patient days	402.2	617.4	293.5	103.7	106.9	47.3	14.3	12.3	1,597.5
Proportion of all patient days	8.8%	16.8%	12.9%	8.5%	9.2%	15.9%	6.8%	6.3%	11.8%

(a) From the National Hospital Morbidity Database, including same day separations and newborns with qualified days.

(b) Includes acute and unspecified separations and newborn episodes of care with qualified days.

(c) Patients with total days of psychiatric care equal to the total length of stay.

Appendix 5: Hospitals contributing to this report

Tables accompanying this report on the Internet at <http://www.aihw.gov.au/publications/hse/ahs99-00/index.html> list the public hospitals that contributed to the National Public Hospital Establishments Database for 1999-00 and the public and private hospitals that contributed to the National Hospital Morbidity Database for 1999-00.

Table A5.1 lists the public hospitals included in one or both databases, with information on their average available bed numbers, their peer group (see Chapter 2) and the Statistical Local Area and RRMA category of their location. Those that were not included in the National Hospital Morbidity Database are annotated as such, as are hospitals not included in the cost per casemix-adjusted separation analysis presented in Chapter 2.

Table A5.2 lists the private hospitals that contributed to the National Hospital Morbidity Database, and whether each was a private free-standing day hospital facility.

Appendix 6: Population estimates

Table A6.1: Estimated resident population by age group and sex, States and Territories, 31 December 1999

Sex	Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia ^(a)
Females	0	43,264	28,651	22,486	12,096	8,839	2,957	2,027	1,628	121,965
	1-4	168,738	119,681	94,958	49,403	36,743	12,161	8,303	6,784	496,863
	5-14	431,469	313,687	247,764	131,731	97,034	33,430	21,386	15,931	1,292,782
	15-24	434,787	326,675	251,527	134,708	97,777	31,675	24,455	14,817	1,316,589
	25-34	488,087	369,131	266,088	141,207	104,665	31,921	25,392	18,097	1,444,851
	35-44	493,915	365,483	271,874	146,752	114,594	36,338	24,991	15,130	1,469,384
	45-54	423,850	316,409	236,115	124,826	103,520	32,167	22,750	10,921	1,270,729
	55-64	290,076	213,405	153,206	78,089	70,848	22,379	12,168	4,802	845,048
	65-74	237,930	175,584	115,357	57,955	60,765	18,206	7,709	2,032	675,560
	75-84	165,931	120,553	78,447	37,512	44,522	12,950	5,016	861	465,799
85 and over	58,824	44,475	28,018	14,487	16,543	4,574	1,495	285	168,707	
	<i>Total</i>	<i>3,236,871</i>	<i>2,393,734</i>	<i>1,765,840</i>	<i>928,766</i>	<i>755,850</i>	<i>238,758</i>	<i>155,692</i>	<i>91,288</i>	<i>9,568,277</i>
Males	0	45,419	30,570	23,571	12,755	9,165	3,107	2,125	1,778	128,507
	1-4	177,480	126,938	99,624	52,477	38,512	12,820	8,584	7,247	523,778
	5-14	453,351	329,193	261,273	139,001	102,394	35,039	22,132	17,167	1,359,890
	15-24	453,177	340,024	262,827	142,055	102,616	32,685	27,126	16,680	1,377,410
	25-34	486,452	366,761	267,008	146,215	107,615	30,406	24,893	20,012	1,449,665
	35-44	496,907	360,732	268,847	148,400	113,399	35,292	23,801	16,844	1,464,512
	45-54	432,779	313,307	243,148	130,373	102,233	32,188	22,413	13,071	1,289,793
	55-64	294,895	213,140	160,710	81,969	69,654	22,454	12,393	6,573	861,903
	65-74	217,565	159,117	109,683	54,729	55,401	16,818	7,083	2,490	622,911
	75-84	116,369	83,397	58,087	27,128	31,088	8,845	3,416	760	329,106
85 and over	25,416	19,972	13,398	6,544	7,237	2,000	653	200	75,423	
	<i>Total</i>	<i>3,199,810</i>	<i>2,343,151</i>	<i>1,768,176</i>	<i>941,646</i>	<i>739,314</i>	<i>231,654</i>	<i>154,619</i>	<i>102,822</i>	<i>9,482,898</i>
Persons	0	88,683	59,221	46,057	24,851	18,004	6,064	4,152	3,406	250,472
	1-4	346,218	246,619	194,582	101,880	75,255	24,981	16,887	14,031	1,020,641
	5-14	884,820	642,880	509,037	270,732	199,428	68,469	43,518	33,098	2,652,672
	15-24	887,964	666,699	514,354	276,763	200,393	64,360	51,581	31,497	2,693,999
	25-34	974,539	735,892	533,096	287,422	212,280	62,327	50,285	38,109	2,894,516
	35-44	990,822	726,215	540,721	295,152	227,993	71,630	48,792	31,974	2,933,896
	45-54	856,629	629,716	479,263	255,199	205,753	64,355	45,163	23,992	2,560,522
	55-64	584,971	426,545	313,916	160,058	140,502	44,833	24,561	11,375	1,706,951
	65-74	455,495	334,701	225,040	112,684	116,166	35,024	14,792	4,522	1,298,471
	75-84	282,300	203,950	136,534	64,640	75,610	21,795	8,432	1,621	794,905
85 and over	84,240	64,447	41,416	21,031	23,780	6,574	2,148	485	244,130	
Total		6,436,681	4,736,885	3,534,016	1,870,412	1,495,164	470,412	310,311	194,110	19,051,175

(a) Includes Other Territories.

Source: Australian Bureau of Statistics unpublished data.

Table A6.2: Projected Aboriginal and Torres Strait Islander population by age group and sex, States and Territories, 30 June 1999

Sex	Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia^(a)
Females	0	1,653	325	1,605	764	308	219	46	688	5,609
	1-4	6,545	1,309	6,394	3,001	1,241	850	172	2,677	22,191
	5-14	14,694	2,856	14,308	7,565	2,919	1,948	404	6,223	50,935
	15-24	10,797	2,097	10,846	5,677	2,302	1,710	353	5,568	39,365
	25-34	9,574	2,018	9,565	5,087	2,120	1,207	333	4,815	34,738
	35-44	7,339	1,577	6,840	3,806	1,477	1,078	253	3,289	25,671
	45-54	4,519	867	4,256	2,141	836	605	117	2,064	15,418
	55-64	2,366	449	2,076	1,048	463	280	30	1,122	7,837
	65-74	1,154	281	1,104	626	234	128	13	554	4,097
	75 and over	527	154	536	297	108	75	5	245	1,951
	<i>Total</i>	<i>59,168</i>	<i>11,933</i>	<i>57,530</i>	<i>30,012</i>	<i>12,008</i>	<i>8,100</i>	<i>1,726</i>	<i>27,245</i>	<i>207,812</i>
Males	0	1,737	344	1,687	808	320	228	51	726	5,902
	1-4	6,734	1,388	6,562	3,192	1,223	884	207	2,931	23,126
	5-14	15,246	2,958	14,701	7,737	3,067	2,094	391	6,849	53,063
	15-24	11,183	2,201	11,096	5,762	2,135	1,654	348	5,644	40,052
	25-34	8,483	1,947	8,653	4,764	1,841	1,062	300	4,828	31,895
	35-44	6,470	1,427	6,194	3,487	1,358	973	232	3,028	23,184
	45-54	4,213	880	3,708	1,935	792	694	87	1,768	14,090
	55-64	2,185	437	1,740	981	415	263	18	977	7,023
	65-74	941	198	864	492	161	121	11	399	3,189
	75 and over	292	88	376	212	85	33	1	192	1,279
	<i>Total</i>	<i>57,484</i>	<i>11,868</i>	<i>55,581</i>	<i>29,370</i>	<i>11,397</i>	<i>8,006</i>	<i>1,646</i>	<i>27,342</i>	<i>202,803</i>
Persons	0	3,390	669	3,292	1,572	628	447	97	1,414	11,511
	1-4	13,279	2,697	12,956	6,193	2,464	1,734	379	5,608	45,317
	5-14	29,940	5,814	29,009	15,302	5,986	4,042	795	13,072	103,998
	15-24	21,980	4,298	21,942	11,439	4,437	3,364	701	11,212	79,417
	25-34	18,057	3,965	18,218	9,851	3,961	2,269	633	9,643	66,633
	35-44	13,809	3,004	13,034	7,293	2,835	2,051	485	6,317	48,855
	45-54	8,732	1,747	7,964	4,076	1,628	1,299	204	3,832	29,508
	55-64	4,551	886	3,816	2,029	878	543	48	2,099	14,860
	65-74	2,095	479	1,968	1,118	395	249	24	953	7,286
	75 and over	819	242	912	509	193	108	6	437	3,230
Total		116,652	23,801	113,111	59,382	23,405	16,106	3,372	54,587	410,615

(a) Includes Other Territories.

Source: ABS (1998).

Table A6.3: Estimated resident population by country/region of birth, Australia 30, June 1999

Country/region of birth	Population	Country/region of birth	Population
Australia	14,518,164	Myanmar	13,080
New Zealand	356,961	Indonesia	61,851
Papua New Guinea	27,251	Cambodia	23,711
Fiji	38,801	Malaysia & Brunei	92,347
Oceania (other)	38,471	Philippines	120,816
<i>Oceania (total)</i>	<i>14,979,648</i>	Singapore	25,141
		Vietnam	173,567
United Kingdom & Ireland	1,214,992	Thailand	22,327
Greece	142,211	China	159,421
Italy	245,159	Hong Kong & Macau	50,800
Malta	55,408	Japan	24,281
Former Yugoslavia	207,628	Korea	40,199
Former USSR & Baltic States	54,992	India	103,932
Hungary	28,442	Sri Lanka	54,800
Poland	69,521	Asia (other)	57,275
Romania	14,057	<i>Asia (total)</i>	<i>1,023,548</i>
Austria	20,980		
France	18,584	Canada	27,323
Germany	119,941	United States of America	59,669
Netherlands	90,826	North America (other)	457
Europe (other)	120,329	<i>North America (total)</i>	<i>87,449</i>
<i>Europe & the former USSR (total)</i>	<i>2,403,070</i>		
		Argentina	12,129
Lebanon	78,901	Chile	25,335
Turkey	31,108	The Caribbean	3,671
Iran	19,766	Central & South America (other)	40,388
Egypt	37,766	<i>South America, Central America & The Caribbean (total)</i>	<i>81,523</i>
Middle East & North Africa (other)	56,915		
<i>Middle East & North Africa (total)</i>	<i>224,456</i>	Mauritius	18,286
		South Africa	73,077
		Africa excluding North Africa (other)	46,109
		<i>Africa excluding North Africa (total)</i>	<i>137,472</i>
		<i>Overseas (total)</i>	<i>4,419,002</i>
		Total	18,937,166

Source: ABS (2000a).

Appendix 7: Further information

Australian Hospital Statistics 1999–00 is complemented by other recent national publications related to hospital statistics:

- Previous years' data in the National Hospital Morbidity Database and the National Public Hospital Establishments Database were summarised in *Australian Hospital Statistics 1998–99* (AIHW 2000a), *Australian Hospital Statistics 1997–98* (AIHW 1999a), *Australian Hospital Statistics 1996–97* (AIHW 1998), *Australian Hospital Statistics 1995–96* (AIHW 1997b) and *Australian Hospital Statistics 1993–95: An Overview* (AIHW 1997a).
- Information on patterns of health and illness, use of health services and health services costs and performance was published in *Australia's Health 2000* (AIHW 2000e).
- *The Burden of Disease and Injury in Australia* provides a comprehensive assessment of the health status of Australians which measured mortality, disability, impairment, illness and injury arising from 176 diseases and injuries, and 10 risk factors using a common metric, the disability-adjusted life year or DALY (AIHW: Mathers et al. 1999).
- *Health Expenditure Bulletin No. 16* provides estimates of total expenditure on health services in Australia from 1989–90 to 1998–99. Expenditure estimates are presented at the aggregate level, as a proportion of gross domestic product (GDP), on a per person basis and by source of funding—Commonwealth, other governments and non-government.
Experimental health expenditure matrices for all States and Territories cover the years 1996–97 and 1997–98.
- *Institutional Mental Health Services in Australia 1998–99* contains detailed statistics on the characteristics and hospital care of admitted patients with a mental health-related diagnosis and/or who were treated in specialised psychiatric services during 1998–99. Statistics on psychiatric hospitals, specialised services in acute hospitals and public community mental health services are also included (AIHW 2001).
- Summary information on public hospital elective surgery waiting times was published in *Waiting Times for Elective Surgery in Australia 1997–98* (AIHW 2000f).
- Statistics on the hospital-based pharmaceutical, nursing and medical workforces are respectively included in *Nursing Labour Force 1998*, *Pharmacy Labour Force 1998* and *Medical Labour Force 1998* (AIHW 1999b, 2000c, 2000d).
- *Reporting of Adverse Events in Routinely Collected Data Sets in Australia* describes the nature and frequency of adverse events reported in the routinely compiled national mortality and hospital morbidity data collections, and gauges the usefulness of these data collections as sources of data on adverse events in Australia (AIHW: Hargreaves 2001).
- Establishment-level data on the resources and activities of private hospitals are compiled and published annually by the Australian Bureau of Statistics. Data for 1998–99 are presented in *Private Hospitals, Australia 1998–99* (ABS 2000b).
- The first, second and third national reports on health sector performance indicators reported a range of indicators of hospital performance (National Health Ministers' Benchmarking Working Group 1996, 1998, 1999). *The Fourth National Report on Health Sector Performance Indicators* provides information on the performance of the health sector and also promotes performance measurement activities in Australia (National Health Performance Committee 2000).

- Hospital performance indicator data have been released in the *Report on Government Services 1999*, the *Report on Government Services 2000* and the *Report on Government Services 2001* (Steering Committee for the Review of Commonwealth/State Service Provision 1999, 2000, 2001).
- Further information on the derivation of AR-DRG cost weights and average costs was published in the *National Hospital Cost Data Collection 1998–99 Final Report on the Development of AR-DRG 4.1 cost weights and analysis tables* (Department of Health and Aged Care 2000).
- The Department of Health and Aged Care’s Internet site includes tables of data from the department’s National Hospital Morbidity (Casemix) Database at <http://www.health.gov.au>. The scope of the department’s tables may differ from the scope of the tables presented in this report, so data in the department’s tables may not correspond exactly to data presented in this report.
- The National Public Hospital Establishments Database and the National Hospital Morbidity Database include data additional to those published in this report. These data can be made available to interested readers. The Institute can provide further information on data availability.

Appendix 8: The National Hospital Cost Data Collection

The National Hospital Cost Data Collection (NHCDC) was established to produce annual updates of Diagnosis Related Group (DRG) cost weights, as incorporated into tables in Chapters 2, 4, 5 and 10. It is a voluntary collection of hospital cost and activity data covering the financial year prior to the collection period, undertaken by the Department of Health and Aged Care (DHAC). Both public and private hospital data are included, with the results being separately reported for the two sectors. The latest data available at the time of publication of this report were for the 1998–99 financial year (Department of Health and Aged Care 2000).

In the 1998–99 collection, cost data were obtained for the following products: acute admitted patients, outpatients, rehabilitation, palliative care, non-acute admitted patients, outreach/community, staff education, research and other. Data for emergency departments and outpatient clinics were also captured by most jurisdictions for this collection. However, this report uses the cost data for acute admitted patients only, that is, for Australian Refined Diagnosis Related Groups (AR-DRG) version 4.0/4.1. For this collection, the cost weights were defined as ‘Combined’ due to the mix of jurisdictions in their coding (ICD-9-CM and ICD-10-AM) and their grouping (AR-DRGs version 4.0 and 4.1) of hospital cost and activity data.

The NHCDC involves arrangements whereby the hospital data are collected by the individual hospitals, and checked and validated by State/Territory/private sector coordinators before being passed onto DHAC. Further checks are conducted by DHAC in processing the data to produce the final cost weights and associated tables.

The participating hospitals include both patient costing and cost modelling sites. Cost modelling generally refers to a process where estimates of costs are produced at the level of each DRG. The approach is ‘top down’ where costs from the hospitals’ general ledgers are allocated down to acute admitted patients, using a series of allocation statistics. Patient costing or clinical costing is a ‘bottom up’ approach where the costs of each service provided to an individual patient are measured or estimated so that the total cost of treating individual patients is obtained. The majority of participating hospitals are cost modelled sites.

The number of public hospitals included in the collection was 173. Whilst the coverage of public hospitals was approximately 33% of total hospitals, the total number of separations was approximately 75% of the estimated total population of separations, because of the significant number of large teaching hospitals in the sample. A total of 52 private hospitals contributed to the collection.

The results for 1998–99 were summarised in Appendix 10 of *Australian Hospital Statistics 1998–99*. The average cost per separation was \$2,488 for public hospitals and \$1,870 for private hospitals.

Further detailed information is available in the full report of the NHCDC for 1998–99 (Department of Health and Aged Care 2000). Cost weights and associated tables for this round and the previous two rounds can be obtained from the Costing and Ambulatory Section, Acute and Co-ordinated Care Branch, Commonwealth Department of Health and Aged Care (phone 02 6289 8272).